

DATA SET CATALOG #38

AE INDEX + 2.5 min. avg.

AE INDEX, Hourly Avg. + from alaska

CORR CRL

1 tape

Table of Contents

1. Introduction
2. Errata/Change Log
3. LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC
INFORMATION SYSTEM
4. Catalog Materials
 - a. Associated Documents
 - b. Core Catalog Materials

1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP's).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC
INFORMATION SYSTEM:

<http://nssdc.gsfc.nasa.gov/nmc/>

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

- a. Associated Documents To find associated documents you will need to know the document ID number and then click here.
<http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/>

- b. Core Catalog Materials

GG-32B

AE HOURLY DIGITAL VALUES

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 11 9-TRACK, 800 BPI TAPES, WRITTEN IN ASCII. THERE ARE TWO RESTORED TAPES. FILES 1-6 ON DR004759 ARE WRITTEN IN AN UNKNOWN FORMAT, AND FILES 7-9 ON DR004759 ARE WRITTEN IN AE FORMAT AND FILES 10-11 ON DR004759 ARE WRITTEN IN AU FORMAT. ALL OF DR004760 IS WRITTEN IN AE FORMAT. 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 THEY WERE RESTORED ON THE IBM 9021. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR004759	DS004759	D000102	1-6	07/01/57 - 12/31/68
		D023726	7	07/01/57 - 12/12/73 (a)
		D030718	8	01/01/66 - 12/31/66 (b)
		D030719	9	01/01/67 - 12/31/67
		D030720	10	01/01/68 - 12/31/68
		D030721	11	01/01/69 - 12/31/69
DR004760	DS004760	D030722	1	01/01/70 - 12/01/70
		D030723	2	01/01/71 - 12/31/71
		D030724	3	01/01/72 - 12/31/72
		D030725	4	01/01/73 - 12/31/73
		D030726	5	01/01/74 - 12/31/74 (c)

- (a) I/O ERROR FILE 1, RECORDS 33, 87, 96, 105, 137, 154
 (b) I/O ERROR FILE 1, RECORD 506
 (c) I/O ERROR FILE 1, RECORD 2334

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

DR/DS004317

AE 6409*0100 0479057705450504053204460445038903940390038503520307025302140163014001510138014201210091008800780305AE 6409*0101
0078007700880105010301000085007300760076009100890082010000860075007400830086008600970093008300960087AE 6409*0102 0114
009900990141019301990204022002300226022501810337021401790229026503250367045005180596067606050287AE 6409*0103 0525061405590582
055105710565060905970631068606330586050304950423037903910407035303580354036603490504AE 6409*0104 0343031903040336042904680341
028303660318043304170383038203930378040904180450041403510315027802940368AE 6409*0105 0431037404440463039903680345032104230475
050605330480041403340338033403250364041105160390042805690416AE 6409*0106 042103480323031803660361038303400363033702990310274
032103320378033204870449043403270227037102960350AE 6409*0107 0204022002190253032403320275029202950298032702880384047505530606
064506430598055905800645058205460423AE 6409*0108 0463032003580423038202700224020202190226020201940164019502580227020402100194
018801700164015301530240AE 6409*0109 0123011401230101008601000109010200950096009801250126012401440160014801860164012401060123
013201260122AE 6409*0110 0128012701080107008900940113012801350144016001680162013301100133013601340133011501150121011300990125
AE 6409*0111 0086008600890089008800860085008500790076007100860082008900940105011601170106010901060099009500950092AE 6409*0112
0083009300880111009600980114009801160149013601840184017001470115011300730052006201190100008601190113AE 6409*0113 0085
009901040120008901000104010100750074006000260021001900330057005000640073008000700087006200740072AE 6409*0114 0096008500760089
008900920089009200830089008400820069007600850087010200590083004200960161014501290091AE 6409*0115 0123010801260136017101790154
016701410144014601520157012801080126015201190158014901200127015301510141AE 6409*0116 0157017802820298033903090296031503150329
033903680385037703850416045104770549054605690561059706530395AE 6409*0117 0703068706860721071807190742072607230761070806260538
045904330417033602970269027002730270024802500524AE 6409*0118 0257025502580219017101510142013401230122008900580054006000600055
005600550061006600560051007300710112AE 6409*0119 0072007500800094007900920111013001440141013901340140014601420138013001220122
012201160110011301160117

FILE 1 RECORD 440 2400 BYTES

[illegible]

ASCII LIST OF cn1125.dat2

FILE 2 RECORD 1 2400 BYTES

AE 6501*0100 0025002900250025002500230024002300200020002100210023003000280025002400230022002500290026002900230025AE 6501*0101
0020002200240026002200230020002500200023002100210023001900190021002100260024002300210024002400210022AE 6501*0102 0022
002300220021002000250027002200210022002200230018002200240025002700220019001900210022002100210022AE 6501*0103 0019001700190022
001700190022001800170021001600180019001500160020001800180022002200200020002100190019AE 6501*0104 0021002100230025002600230020
001900150017001300200019001700200015001300130013001700180018002100140018AE 6501*0105 0021001500150015001500120018002200240025
001700170027002300110014001300170018002000250017002300240019AE 6501*0106 0024002900270020002000270037002600200017001800230021
001900170018001800190018001800190018001900180021AE 6501*0107 0027001900190019001900200018001800180019002100190019002000220022
002100220025002600240023002300250021AE 6501*0108 0018001300160016001300120020001600150011001000100011001100120011001000130012
001000140019002000110014AE 6501*0109 0012000900070009001200180013001300110009000800100010000900090008000900090009001000100008
000800080010AE 6501*0110 0012000900150013001300090008000900090013001600120018001800160018001400170017001200150015001700170014
AE 6501*0111 0019001700120015001800150020001900240027002800230023002500260028003300350035003700360038004000430027AE 6501*0112
0049004600490051004100300032004100490053005300460043004400480045003300280016001500190024002400280038AE 6501*0113 0033
003900360032003800370033002800270031002200290029003000440059002600250039003300530060006000600038AE 6501*0114 0051004200400040
005000350028004200450052005700450042004300370033003200310027002300230023002000210037AE 6501*0115 0020001900160019001800180017
001300220015001600160018002600280036003300260024002700260022002300330022AE 6501*0116 0025002600310034003500340028002600210020
002300230022002000230020002300250022002300250025002600260025AE 6501*0117 0025002100300026002800320033004100450053005500670072
007100570044012703500295021302100220019202120105AE 6501*0118 0298031002970294029602360256021601960172014801590173017801840200
019301820178015401340154013301480204AE 6501*0119 0140014801280114015501110097009301140102011301230143016001740167015601560149
013701220126016001510135

ASCII LIST OF cn1125.dat2

FILE 2 RECORD 1314 2400 BYTES

AU 6512*3104 0013001400140009000900080008000800080009000800080007000400040004000400030003000200020001000400020007AU 6512*3105
0003000300080005000800070007000400020003000600080009000900090009000900080009000800070007000400040007AU 6512*3106 0003
000200020004000600050003000300030004000300040004000400040003000400050005000600080009000800070005AU 6512*3107 0006000700070017
002900130012000800060008000800080009001100120012001400170018001600120010001000100012AU 6512*3108 0017003500170014001000230034
00110009000900090012001200120012002800120010009000900100020005300610019AU 6512*3109 0024001300130015001500170022006800270015
002200230024001900300036002800320050004600510050004300430030AU 6512*3110 0042003800330031002600210023003100510058004800450038
003700430055006300510042003400240014001300130036AU 6512*3111 0013001100120021001800100012003400590036001900200026003500430043
003800370034005300580058005700380033AU 6512*3112 0032003400370036004000390037004000440047004600460041003000280019001600170016
001700160017001600160030AU 6512*3113 001700160016001700170017001600170016001600170016001600170016001600160016001600160016
001600170016AU 6512*3114 0016001700170017001700170016001600170016001700180033004600280015001500150015001400130014001400140018
AU 6512*3115 0014001400130013001400140013001700170018001800130013001100110011001100120018001400130013001300130014AU 6512*3116
001000100010001000150021002100230027002200320024002400220018002700170013001900100090008001000090017AU 6512*3117 0031
001000080010000800100010001400190009000900090012001300120009000800070008000700070007000700060010AU 6512*3118 0001000100070011
001100120012001000070004000400050005000200050002000500050005000900090009001100100007AU 6512*3119 0013001700180017000900020001
000200050004000500040004000400020002000500050007000700070007000700020007AU 6512*3120 0005000900100009000300050005000500050005
00050003000500050007000700050005000500050005000500050006AU 6512*3121 0005000500050005000500050002000200020003000200030003
000300030003000300040004000500050005000500050004AU 6512*3122 000400040004000400040004000600060006000600060005000500060006
000700040006000400040003000400060005AU 6512*3123 000600040004000400060004000400060008001000140014001300130010001000100010
001000100010001000100009

ASCII LIST OF cn1125.dat2

FILE 3 RECORD 1 2400 BYTES

AE 6601*0100 0019002100210018001900210021002100180017001700180019002100210019001900190019002000190016001700190019AE 6601*0101
0018002000240026002400180017001800170018001800170017001800220019001600150020002400210020002000180019AE 6601*0102 0020
00210022002200210021002500240021002000200020002100200021002100220021002000200018002000180021AE 6601*0103 0018001500170018
001800180020001800190018002100210020002000200020002000170020001800150014001900240019AE 6601*0104 0026002500230024001900200022
002700330033003100290026002100260043002500370029002800290033003300280028AE 6601*0105 0028002800300026002800260032003000250029
004300360022001800090007001800220023002100190019001600110024AE 6601*0106 0012001100080014001500150007000600050005000700070007
000700070007000900070009000900200022001800170010AE 6601*0107 0016001800240029003000260025002600240027002800280024002400280029
002900280037003000310030002800270027AE 6601*0108 0026002700220022002800300024002400220023002900220019001800190021002000220021
002200190022002500250023AE 6601*0109 002500250027002200210023002100240024002500260027002800280024002700240025002700280024
002400270025AE 6601*0110 0026002600280025002600230023002100260023002500220024002200210024002200220019001800180019001600180022
AE 6601*0111 0019002100230017001900190020001800190019001800180016001600180021002200180019002200200016002000200019AE 6601*0112
0020002400290025002500250028002600230023002200240021002200220025002200220021002100210023002100230023AE 6601*0113 0022
002100210020002200230024002400230023002400270029002800290028002800280027002800290027002500270025AE 6601*0114 0026003200300033
002900280028002900310031002900270029003100270031002900310029002900310031003000290030AE 6601*0115 0029002700280027002900290031
002900290031003100270028002900290029002800280028002900290029002900280029AE 6601*0116 0029002700290027002900300029002900310031
003100300028002800260027002900280030002900300030002900280029AE 6601*0117 0028002800280029002800280029002800270026002600260027
002900290029002700270027002500250026002600260027AE 6601*0118 0025002500230025002400250025002400240025002300220022002000210021
002400240024002500240026002600270024AE 6601*0119 0026002600270025002300150013001200190019002000160015001600150016001600150015
001600140014001500140018

ASCII LIST OF cn1125.dat2

FILE 3 RECORD 1314 2400 BYTES

AU 6612*3104 000300030006000600060007000600070007000600060006000600060006000600060006000600060007000600090006AU 6612*3105
00090009001000100010001000090009000900100010001000090010000900100010000900100010001000090010AU 6612*3106 0010
000900100010001000100014001400100014001000100014000900090009001000100011001000070009000900090010AU 6612*3107 0006000600060006
000600070007000600070005000400030003000600070009001000140014001800180017001500100009AU 6612*3108 0014001400140010001000140010
001400100010001000090009001000100009000700060010001400150010000900090011AU 6612*3109 0006000700060007000600070007000600060007
000700070009000600030009001500140010000900060009000700140008AU 6612*3110 0014001400100014001000090006000700100010001400090007
000900090009000900060007000700070007000600070009AU 6612*3111 0006000600030001000100030001000100010000000100010000000100010003
000300010001000100010001000600060002AU 6612*3112 00030000-001-002-001000000000003000500070003-002-002-002000000050004-003-004
0003000400060003-0020001AU 6612*3113 -00200000001000400030000-002-00200000001000300030001-001-003-003-001000300030003-001-002
-00200010000AU 6612*3114 0007000700060010000100040004000300100007000600100006000800100006000600050005000500030000-001-0010005
AU 6612*3115 0000-002-003-002-003-004-0030003-001-002-0020003000300030002000300040004000400040004000400040001AU 6612*3116
000500040004000400010003000500060003000100010001000000000000000000000000000000000002000200020002AU 6612*3117 0004
000600060004000400050005000500060006000600060006000600060005000400070011000300050007000400030005AU 6612*3118 0005000500050005
000500050005000500050005000600060006000700070007000600050006000700070007000600060006AU 6612*3119 0018000900070007001000070009
00090007000600090010000700060006000600060006000600060007000700090008AU 6612*3120 0009000700090010001000100009000700090007
000600060009000600070009000900060009000900090007001000100008AU 6612*3121 000000120009000000000000900090001000600000000000000001
000600070007000600060007000700070007000700060005AU 6612*3122 000700060004000700100007000600040007000700060006000700070007
000700090010001000100010001000100008AU 6612*3123 0009000900100010001200140015001500150015001400140012001700320023002300260029
003100310032003200340020

ASCII LIST OF cn1125.dat2

FILE 4 RECORD 1318 2400 BYTES

[illegible]

ASCII LIST OF cn1125.dat2

FILE 5 RECORD 1 2400 BYTES

```
AE 6701*0100      056 057 069 074 100 102 108 101 094 098 092 100 085 067 089 062 059 063 060 072 059 066 058 071 078AE 6701*0101
      055 082 051 045 047 051 038 040 046 048 041 040 042 049 030 034 043 027 030 043 046 052 039 038 044AE 6701*0102      045
042 042 042 035 037 037 033 041 040 040 045 050 054 055 069 067 081 084 077 058 058 046 040 051AE 6701*0103      041 046 046 056
062 063 060 052 048 046 042 043 038 040 039 071 112 184 213 185 165 264 198 208 097AE 6701*0104      139 116 159 154 169 183 179
195 216 220 205 193 183 178 177 178 167 158 150 139 119 089 075 064 159AE 6701*0105      055 046 039 045 067 043 031 035 043 048
056 064 050 047 058 057 072 072 083 104 097 094 084 077 061AE 6701*0106      096 106 146 117 167 165 074 061 062 072 077 073 091
115 121 128 109 095 072 074 087 099 086 068 098AE 6701*0107      049 042 070 106 122 102 068 049 057 058 056 040 061 077 052 045
062 081 069 060 069 080 088 090 069AE 6701*0108      083 083 081 071 061 050 045 045 050 056 061 058 046 033 036 046 056 075 083
056 046 045 045 042 056AE 6701*0109      040 045 057 056 043 042 050 042 047 053 047 042 039 046 038 032 055 054 053 047 055 046
050 051 047AE 6701*0110      045 047 045 048 067 083 080 074 091 156 253 386 650 644 696 579 486 663 722 488 669 563 547 576 361
AE 6701*0111      383 499 470 594 597 600 596 520 590 700 685 639 633 633 635 643 652 682 663 547 486 337 357 364 563AE 6701*0112
      444 423 454 528 588 592 608 603 494 572 570 503 616 685 782 808 605 557 519 567 675 675 433 663 582AE 6701*0113      664
472 593 554 548 572 365 581 619 614 404 627 684 704 682 651 565 438 457 464 515 485 517 503 553AE 6701*0114      517 475 426 385
377 336 317 360 454 465 425 454 478 409 369 339 321 354 381 442 465 400 453 512 413AE 6701*0115      664 728 747 791 806 781 765
718 710 772 780 845 943 793 822 911 957 952 997 970 966 804 831 954 834AE 6701*0116      892 89511901352128811681342156114441281
1001 900 945 833 906 810 832 760 929 9811133 915117211991072AE 6701*0117      841 926 644 466 498 502 455 430 398 384 366 318 325
349 390 438 433 388 345 315 299 287 283 286 432AE 6701*0118      261 231 219 253 298 319 318 286 255 229 201 213 181 175 181 111
087 142 144 179 172 136 117 136 202AE 6701*0119      110 089 091 109 113 098 086 087 100 096 085 073 085 069 088 080 101 147 149
136 141 118 114 099 103
```

ASCII LIST OF cn1125.dat2

FILE 5 RECORD 5261 1920 BYTES

```
AU 6912*3108      014 014 014 014 014 016 016 019 021 021 021 021 021 021 023 023 026 028 028 026 026 026 028 030 021AU 6912*3109
      035 039 039 037 035 032 030 026 023 007 008 009 012 016 018 019 019 019 019 019 020 021 023 023AU 6912*3110      026
030 035 038 044 051 062 072 077 079 081 084 089 093 096 101 103 103 103 104 106 109 111 112 080AU 6912*3111      107 101 097 092
089 083 081 079 077 075 073 069 067 066 062 060 057 054 049 046 043 042 042 044 069AU 6912*3112      051 047 044 046 051 047 046
046 048 046 043 042 042 041 040 039 037 036 035 034 033 032 030 029 041AU 6912*3113      028 027 027 027 027 027 028 028 028 028
028 028 028 027 027 027 027 027 027 027 025 018 013 011 026AU 6912*3114      007 005 004 003 001 001 001 003 004 005 005 005 008
011 011 011 010 011 012 010 007 009 012 015 007AU 6912*3115      015 015 018 019 015 012 012 013 017 015 013 015 018 017 016 016
011 011 012 010 006 006 008 009 013AU 6912*3116      005 002 001 001 002 002 001 000 000 001 001 002 002 002 002 002 002 003
002 002 002 002 002 002AU 6912*3117      002 006 011 001 000 000 000 000 000 000 000 000 001 001 002 002 003 004 004 007 009 009
009 004 003AU 6912*3118      014 016 019 019 019 016 012 012 016 021 026 028 028 028 023 023 023 023 023 026 028 028 030 030 022
AU 6912*3119      032 030 023 016 012 009 009 012 014 015 016 016 016 015 014 011 006 008 009 009 014 019 019 019 015AU 6912*3120
      015 017 017 017 017 016 012 008 008 008 008 008 009 009 009 008 015 021 022 020 017 020 021 021 014AU 6912*3121      013
014 015 015 015 014 012 009 009 009 009 011 013 015 016 017 019 020 021 021 021 021 020 015AU 6912*3122      016 015 014 013
013 014 014 017 020 022 024 026 027 026 026 021 017 016 016 016 019 022 024 024 019AU 6912*3123      024 024 022 020 016 016 016
016 016 014 011 008 009 011 014 017 019 017 017 015 012 009 012 018 016
```

ASCII LIST OF cn1125.dat2

FILE 6 RECORD 1 2400 BYTES

AE 6801*0100 324 285 376 211 163 173 188 192 202 251 304 310 242 292 296 386 446 457 447 506 515 515 537 585 342AE 6801*0101
567 474 492 596 641 558 578 579 567 542 502 465 445 420 422 425 439 457 552 619 458 489 520 525 514AE 6801*0102 681
725 607 603 595 558 523 515 572 683 733 674 640 583 541 466 468 439 482 503 484 454 446 446 559AE 6801*0103 482 479 453 417
415 489 501 520 501 488 403 416 408 424 444 431 474 448 353 373 493 468 437 509 451AE 6801*0104 431 358 407 551 593 577 516
528 555 530 471 486 471 492 556 526 467 437 384 468 468 475 474 455 487AE 6801*0105 439 436 434 458 449 410 382 391 424 387
375 416 360 361 379 376 394 431 362 319 295 293 320 294 383AE 6801*0106 301 315 302 313 327 345 361 330 266 293 317 315 300
305 345 480 533 519 436 306 311 425 429 574 365AE 6801*0107 350 240 233 257 248 233 306 308 309 359 464 451 490 438 404 452
461 425 450 426 435 453 316 364 370AE 6801*0108 391 346 333 352 380 373 301 293 291 290 306 321 343 308 300 283 336 344 305
306 333 278 289 276 320AE 6801*0109 339 341 343 277 286 308 303 198 305 311 218 285 385 240 293 259 283 344 298 268 274 241
226 243 286AE 6801*0110 266 208 211 143 150 337 128 127 199 232 302 270 226 360 226 264 341 273 430 536 547 639 583 539 314
AE 6801*0111 704 674 506 419 608 574 568 553 607 541 568 495 524 567 565 578 534 587 590 630 581 517 511 480 562AE 6801*0112
656 624 605 594 602 604 621 628 603 583 517 516 460 454 450 435 467 468 451 442 440 415 491 451 524AE 6801*0113 467
475 480 506 499 492 481 460 483 482 462 447 424 408 389 365 361 370 389 386 375 394 440 416 435AE 6801*0114 425 404 390 428
470 484 480 474 491 461 540 528 524 518 524 495 490 499 490 474 436 415 405 401 469AE 6801*0115 396 397 397 383 390 393 413
482 537 542 503 511 584 690 738 989 834 744 712 530 572 588 566 541 560AE 6801*0116 568 525 509 540 595 608 584 520 451 450
437 405 352 302 255 251 298 302 264 238 229 202 185 158 385AE 6801*0117 148 143 142 130 152 155 124 128 115 157 130 092 081
087 087 092 101 082 057 091 147 103 120 125 116AE 6801*0118 088 100 100 068 079 060 067 077 085 119 068 099 110 136 086 099
077 132 094 127 161 171 196 141 106AE 6801*0119 170 170 106 169 125 154 169 143 185 215 248 222 184 163 193 155 197 179 196
197 190 182 167 173 177

ASCII LIST OF cn1125.dat2

FILE 6 RECORD 1754 2400 BYTES

AU 6812*3104 034 044 050 057 057 038 028 027 028 037 047 047 046 038 036 029 022 024 043 040 023 016 016 019 035AU 6812*3105
019 018 015 013 011 011 020 012 014 018 018 017 009 016 018 015 017 018 015 013 014 013 020 019 016AU 6812*3106 014
019 016 020 019 022 012 012 013 017 019 019 017 017 017 017 017 017 017 017 017 016 017AU 6812*3107 016 016 014 024
028 019 021 027 030 026 020 017 015 017 023 025 012 015 023 016 019 030 049 038 023AU 6812*3108 015 023 030 023 024 027 030
033 032 037 045 030 028 033 009 013 058 036 044 076 076 042 035 054 036AU 6812*3109 045 038 033 026 014 010 012 016 024 035
038 029 023 026 035 031 028 037 040 040 040 036 053 065 032AU 6812*3110 063 053 054 066 060 026 021 045 046 029 017 023 022
014 012 035 059 038 022 034 041 040 041 038 037AU 6812*3111 037 038 037 034 027 023 023 034 041 042 045 053 045 029 027 032
027 015 020 032 032 034 035 038 033AU 6812*3112 024 033 022 018 022 032 033 038 043 047 047 048 047 044 041 037 033 028 023
024 026 023 029 032 033AU 6812*3113 030 028 024 016 014 014 014 020 023 028 029 029 025 025 022 019 017 015 015 013 013 017
022 028 021AU 6812*3114 032 024 014 014 015 007 007 007 007 007 007 007 007 009 009 009 009 009 014 014 017 017 017 012
AU 6812*3115 017 017 017 019 022 022 019 014 014 014 017 022 031 038 048 055 058 060 060 060 060 060 060 060 036AU 6812*3116
058 055 055 055 055 055 058 065 070 087 109 118 118 118 106 094 087 084 084 094 106 118 121 123 087AU 6812*3117 126
126 126 126 133 145 157 169 181 188 198 208 222 251 268 285 297 302 302 290 278 273 290 290 218AU 6812*3118 234 220 201 193
181 177 164 157 193 193 192 180 172 188 196 205 235 263 265 268 274 263 252 268 214AU 6812*3119 289 289 283 260 235 218 214
235 226 245 229 246 274 277 252 269 278 278 251 249 240 235 218 221 250AU 6812*3120 258 269 252 232 226 221 211 197 168 152
146 149 149 140 128 118 108 098 094 091 087 085 085 085 156AU 6812*3121 085 085 085 094 098 100 100 098 097 101 101 093 100
099 099 100 102 110 105 105 116 116 109 110 100AU 6812*3122 116 109 105 110 100 098 099 099 098 093 085 067 050 044 039 039
041 044 038 032 027 021 019 020 066AU 6812*3123 067 128 114 098 082 081 084 093 109 111 103 106 111 111 110 099 084 073 063
052 044 042 038 036 085

ASCII LIST OF cn1125.dat2

FILE 7 RECORD 1 2400 BYTES

AE 7001*0116 68 74 76 90 101 117 165 289 347 329 402 456 628 484 534 565 578 516 581 620 647 690 712 749 409AE 7001*0117
719 684 689 713 658 603 549 495 511 511 479 490 529 461 472 431 418 382 369 353 297 322 265 272 486AE 7001*0118 304
281 259 248 232 229 196 180 177 158 140 80 83 67 124 123 94 87 87 110 84 94 88 97 150AE 7001*0119 50 52 66 78
59 84 81 68 55 55 73 62 46 49 44 57 59 54 50 75 45 39 56 69 59AE 7001*0120 41 80 61 42 48 50 50
29 55 46 39 38 44 41 32 32 45 36 56 56 64 68 61 56 48AE 7001*0121 47 39 45 46 32 40 54 54 36 52
60 83 91 85 80 82 84 89 90 90 97 93 95 95 69AE 7001*0122 92 85 76 66 71 63 62 54 57 81 113 121 107
101 114 111 114 113 102 141 165 154 143 159 102AE 7001*0123 160 192 177 188 161 160 168 155 175 194 205 184 234 232 217 209
214 188 171 145 131 134 135 122 177AE 7001*0200 146 173 165 155 143 135 112 118 109 132 132 135 128 136 132 124 143 126 115
85 95 76 86 106 125AE 7001*0201 114 121 103 77 68 74 80 119 110 98 100 99 107 99 92 102 78 95 122 155 192 152
150 144 110AE 7001*0202 166 193 205 216 209 172 159 182 173 180 188 185 170 176 152 141 168 185 164 165 152 164 164 171 175
AE 7001*0203 172 226 239 316 305 307 336 362 398 435 428 418 455 443 438 448 463 470 477 462 454 440 397 390 386AE 7001*0204 606
440 463 454 512 498 583 606 561 501 509 573 529 498 520 575 589 632 678 640 587 588 580 558 584 552AE 7001*0205 273 238 220 226
575 593 571 530 496 467 430 425 426 421 421 424 389 359 355 314 278 253 239 261 274 265 249 400AE 7001*0206 357 343 348 396 391 441 390
251 261 274 297 318 266 192 154 201 259 216 231 270 350 405 532 539 472 429 386 302AE 7001*0207 633 630 725 813 843 758 761 710 581 539
290 343 394 405 323 373 414 496 565 590 608 617 705 776 677 706 688 484AE 7001*0208 588 533 594 574 479 442 476 464 417 396 392 391 356
545 528 516 448 441 486 489 547 623 688 723 664 661 617 623AE 7001*0209 303 318 321 324 308 315 331 347 335 314 289 287 312 297 308 279
341 393 433 479 446 457 435 407 371 309 307 436AE 7001*0210 361 356 374 413 390 425 447 354 416 586 629 677 688 653 579 512 522 425 439
297 336 322 301 288 272 296 347 310AE 7001*0211
501 534 549 509 475 492

ASCII LIST OF cn1125.dat2

FILE 7 RECORD 1750 2400 BYTES

AU 7012*3104 21 18 21 21 18 18 18 21 32 28 11 14 21 23 18 18 17 16 16 16 16 11 11 12 18AU 7012*3105 16
12 14 14 14 16 16 11 12 14 18 14 11 11 14 16 23 21 11 10 11 12 13 14 13 13AU 7012*3106 16
16 16 16 14 11 11 11 14 16 14 11 11 13 14 21 18 14 14 12 11 11 11 13AU 7012*3107 10 11 11 16
9 11 11 11 11 14 18 16 8 8 10 11 14 15 14 11 9 9 9 10 11AU 7012*3108 12 12 14 15 17 13 11
11 12 13 14 14 14 15 16 14 16 15 14 14 14 14 16 18 14AU 7012*3109 16 25 18 16 16 23 18 16 14
14 15 19 16 14 14 9 15 11 12 12 12 14 16 15AU 7012*3110 16 14 11 11 16 19 15 11 11 15 11 14 14
9 7 14 19 21 25 32 37 24 20 21 16AU 7012*3111 23 25 32 23 23 18 16 21 31 25 18 21 22 28 15 21
24 28 28 21 23 21 18 18 22AU 7012*3112 24 24 23 22 22 21 24 23 25 25 22 26 21 25 23 23 23 24 20
21 28 24 38 38 24AU 7012*3113 25 21 45 24 21 22 22 22 27 25 20 25 24 21 25 25 25 22 19 20 20 25
23 19 23AU 7012*3114 20 21 18 19 21 16 21 15 16 16 16 16 17 18 19 18 17 19 21 16 15 20 22 18 18
AU 7012*3115 25 21 23 22 18 23 23 21 21 24 25 24 19 18 19 20 20 20 17 21 28 30 16 17 21AU 7012*3116 16
21 20 19 18 18 18 17 16 18 28 18 14 22 22 19 20 14 14 18 12 12 12 18 18 17AU 7012*3117 21 16 25 19
16 16 18 27 81 62 19 21 16 18 15 15 19 31 39 14 18 27 15 26 14 22 23 24AU 7012*3118 15 20 19 21 17 21 18
19 20 18 18 21 20 17 16 17 16 15 18 21 18 14 18 21 23 16 16 18AU 7012*3119 23 21 19 21 22 23 23 21 21 25
16 18 21 15 21 18 17 18 18 18 18 25 18 18 22 19 21 18AU 7012*3120 23 28 26 21 23 24 26 21 18 26 27 27 28
23 18 17 23 25 22 21 23 23 21 24 21 21 22 21AU 7012*3121 25 28 30 21 18 25 24 21 23 25 24 21 20 24 25 18
27 23 19 28 31 24 28 31 31 30 21 25AU 7012*3122 34 30 28 28 28 27 25 24 21 18 16 22 23 25 23 21 21 21 21
24 27 28 28 28 23 26 36 24AU 7012*3123
22 18 16 21 21 23

ASCII LIST OF cn1125.dat2

FILE 8 RECORD 1 2400 BYTES

AE 6601*0100 033 028 020 020 016 015 014 014 014 016 016 019 019 019 016 016 015 015 017 017 017 016 013 014 017AE 6601*0101
014 017 018 017 016 015 012 015 010 012 012 009 009 011 009 011 009 012 011 013 013 013 011 013 013AE 6601*0102 012
010 009 009 009 012 012 012 012 013 014 011 012 015 011 012 012 015 012 011 014 011 014 012 012AE 6601*0103 016 016 016 016
016 016 016 016 016 016 017 017 017 017 017 017 020 020 025 025 027 026 018 019 018AE 6601*0104 024 024 027 024 023 025 024
031 037 036 030 026 021 017 022 040 025 033 023 023 027 030 028 025 027AE 6601*0105 025 025 027 025 032 026 032 029 028 034
043 040 026 022 020 020 021 029 025 021 020 025 021 021 027AE 6601*0106 021 021 020 026 027 027 018 017 015 015 013 014 015
016 017 016 017 015 015 015 015 025 023 018 018AE 6601*0107 015 022 027 032 025 016 014 015 020 023 022 018 013 018 026 030
027 023 035 031 030 036 034 033 024AE 6601*0108 035 038 031 025 024 020 025 024 018 016 022 025 033 054 068 075 074 071 064
059 056 048 036 035 041AE 6601*0109 044 098 115 049 042 033 035 044 045 043 055 055 044 040 033 034 034 034 035 059 065 040
058 055 050AE 6601*0110 028 032 029 033 030 028 048 023 025 055 037 023 025 027 025 019 016 023 048 049 033 025 025 037 031
AE 6601*0111 036 022 027 035 018 023 026 025 022 037 046 028 025 025 023 026 026 024 021 021 018 021 021 021 026AE 6601*0112 023
017 016 034 046 051 051 045 030 033 032 026 017 014 013 013 011 013 013 013 014 020 023 023 023 025AE 6601*0113 023
023 023 023 023 023 026 023 023 026 018 020 022 021 023 022 022 022 021 022 023 021 018 020 022AE 6601*0114 018 020 023 025
021 021 021 021 021 021 020 029 038 020 021 020 023 021 021 021 021 021 022 020 022AE 6601*0115 020 018 018 025 039 036 027
028 026 029 026 026 020 022 020 017 017 017 029 046 058 077 087 080 034AE 6601*0116 054 028 016 016 016 021 022 038 045 034
029 030 027 024 022 022 022 016 018 016 017 018 018 022 025AE 6601*0117 024 023 021 019 020 023 027 027 025 022 021 019 019
019 019 019 017 017 017 019 020 019 019 021 021AE 6601*0118 031 020 027 018 026 023 021 026 021 057 097 115 054 138 127 122
111 095 132 114 102 096 108 108 075AE 6601*0119 100 084 068 052 040 039 038 024 019 019 020 020 030 023 025 036 042 033 029
033 029 036 031 040 038

ASCII LIST OF cn1125.dat2

FILE 8 RECORD 5256 2400 BYTES

AU 7112*3104 059 063 061 070 084 086 091 084 075 068 061 075 075 064 069 087 080 068 077 082 082 079 070 065 074AU 7112*3105
056 047 047 047 047 054 056 056 058 061 061 061 063 063 063 063 063 065 077 077 068 068 077 061AU 7112*3106 058
075 082 061 061 063 063 068 061 047 052 088 057 045 060 120 092 065 070 072 075 075 075 072 069AU 7112*3107 070 061 058 061
065 068 075 058 058 068 068 058 045 049 051 010 005 019 039 014 007 023 026 023 045AU 7112*3108 016 017 020 026 031 042 042
042 031 024 044 034 032 058 062 028 026 021 021 021 037 038 014 014 031AU 7112*3109 026 026 021 014 015 023 019 012 013 021
024 021 014 017 026 028 026 022 023 025 024 017 017 019 021AU 7112*3110 021 019 016 016 016 020 017 011 016 022 012 008 016
017 011 009 014 012 007 006 016 020 013 005 014AU 7112*3111 006 017 027 038 019 010 030 019 021 029 023 012 010 012 018 018
013 006 006 015 019 019 019 019 018AU 7112*3112 016 016 016 015 016 019 020 020 019 019 019 020 020 020 021 022 024 023 018
011 012 015 021 025 019AU 7112*3113 024 024 024 024 024 026 026 025 023 017 016 016 016 016 015 012 011 011 011 011 011
011 011 017AU 7112*3114 011 011 012 013 014 014 014 014 013 014 020 029 034 030 023 034 028 020 028 017 014 014 021 043 020
AU 7112*3115 025 048 063 055 032 008 008 012 007 009 010 012 012 016 015 043 016 016 015 015 012 012 012 012 020AU 7112*3116
012 012 012 013 012 012 012 012 012 017 058 145 197 147 146 127 067 014 005 010 012 019 024 016 046AU 7112*3117 012
009 005 005 010 014 014 012 010 013 013 011 013 017 020 023 023 023 025 028 030 030 033 038 018AU 7112*3118 027 027 025 021
018 016 017 031 028 019 031 031 019 007 017 024 022 019 021 018 021 024 025 026 022AU 7112*3119 031 031 032 035 036 035 026
021 021 021 021 012 012 013 015 015 012 012 010 009 010 009 009 010 019AU 7112*3120 010 015 015 016 020 024 024 022 023 025
025 025 024 021 021 021 021 031 019 018 018 019 019 019 021AU 7112*3121 025 020 020 029 036 040 035 025 025 026 033 036 034
036 040 042 043 043 039 040 048 053 056 059 037AU 7112*3122 060 062 064 068 070 070 070 070 072 081 081 071 069 060 046 067
093 110 114 074 047 043 040 050 069AU 7112*3123 046 032 039 069 093 098 081 072 091 128 156 158 151 130 119 105 088 083 079
078 082 084 086 086 093

ASCII LIST OF cn1125.dat2

FILE 9 RECORD 1 2400 BYTES

AE 7201*0100 169 161 164 186 199 186 167 169 176 183 181 185 174 169 182 194 182 145 138 159 146 112 103 096 164AE 7201*0101
101 098 086 090 110 109 082 066 056 056 057 068 067 060 077 074 089 102 081 076 089 089 073 062 080AE 7201*0102 063
066 067 064 070 069 067 069 071 066 066 076 084 084 084 078 072 068 061 055 070 073 057 048 069AE 7201*0103 047 057 049 052
056 057 058 050 044 037 045 033 033 035 038 043 050 034 036 032 033 038 028 035 043AE 7201*0104 035 040 051 042 047 037 027
033 043 036 038 048 050 043 031 027 028 039 033 031 030 026 040 029 037AE 7201*0105 046 054 039 064 059 055 036 067 061 032
043 050 034 040 041 045 025 038 050 042 032 034 038 036 044AE 7201*0106 035 030 026 031 033 036 038 039 030 026 023 031 040
028 036 028 022 035 037 032 022 025 023 035 031AE 7201*0107 039 028 028 037 032 035 033 033 034 033 046 040 043 046 045 046
049 047 058 046 056 065 070 072 044AE 7201*0108 075 078 077 071 066 067 068 067 068 066 061 058 061 068 069 065 069 071 070
060 054 056 058 053 066AE 7201*0109 053 065 081 071 063 066 068 077 076 080 082 085 087 091 092 091 095 099 098 085 063 050
043 048 075AE 7201*0110 045 038 033 051 044 049 055 062 078 101 098 082 071 060 053 044 040 038 034 034 036 038 038 033 052
AE 7201*0111 038 042 041 040 046 038 041 047 046 049 047 047 040 029 025 038 056 077 058 039 049 047 040 037 044AE 7201*0112 103
041 047 061 053 064 063 076 072 086 086 084 078 086 067 061 062 047 049 048 112 103 069 065 085 069AE 7201*0113 103
100 120 131 107 122 165 156 162 170 143 166 129 155 123 161 152 164 175 163 164 184 174 161 148AE 7201*0114 150 146 154 182
204 196 176 240 155 130 120 132 157 139 154 149 162 149 153 165 168 169 147 148 160AE 7201*0115 173 170 165 157 153 146 157
161 173 146 139 149 152 129 121 130 131 129 150 146 153 186 213 286 159AE 7201*0116 278 201 164 147 106 087 101 168 219 203
149 146 121 080 103 089 068 096 063 058 101 063 047 071 122AE 7201*0117 107 129 129 118 129 135 133 127 126 124 116 106 099
092 094 080 074 059 039 077 075 075 039 036 097AE 7201*0118 033 035 033 033 036 034 036 079 041 075 102 214 208 169 147 101
130 262 349 303 275 261 299 246 146AE 7201*0119 250 291 271 285 369 305 330 337 467 455 413 338 426 452 392 359 359 337 348
344 309 308 324 348 351

ASCII LIST OF cn1125.dat2

FILE 9 RECORD 3509 1920 BYTES

AU 7312*3108 105 126 203 158 143 163 154 157 138 099 115 135 117 138 171 179 135 124 111 086 091 062 072 073 127AU 7312*3109 076
087 085 065 056 089 043 026 082 075 059 056 037 065 044 081 111 059 037 053 076 047 074 071 072 065AU 7312*3110 054 044 052 056
040 042 039 047 050 046 053 033 051 028 054 034 018 025 029 030 031 035 034 028 036 021 030 038AU 7312*3111 032 056 079 041 101 087 088
051 042 050 042 038 034 040 033 031 029 037 032 019 019 021 023 025 027 067 051 038AU 7312*3112 026 025 032 036 047 053 059 059 071 059
080 078 072 066 055 036 050 033 028 025 025 018 019 027 029 029 026 049AU 7312*3113 046 055 056 058 052 040 082 062 066 046 039 050 046
057 062 068 073 075 073 064 055 082 058 060 040 053 063 056AU 7312*3114 059 045 042 048 045 053 060 059 055 076 088 060 077 084 063 066
032 032 029 062 064 066 088 064 052 066 079 056AU 7312*3115 151 163 112 122 106 077 057 047 107 166 135 092 085 086 079 071 138 114 113
059 074 065 059 074 168 143 106 072AU 7312*3116 123 136 236 290 227 097 050 031 032 037 056 067 080 065 046 073 064 047 046 037 057 056
177 160 109 120 119 113AU 7312*3117 046 026 018 016 012 026 022 028 029 057 020 029 016 021 063 060 031 058 026 021 017 024 049 064 032
054 056 086AU 7312*3118 038 033 035 016 016 016 014 013 024 024 021 016 017 027 038 029 018 015 013 016 008 015 032 012 021AU 7312*3120 074
AU 7312*3119 013 051 086 119 156 147 130 119 098 102 104 103 106 125 134 141 137 125 120 103 093 091 083 079 107AU 7312*3121 091 077 068 068
073 069 143 109 061 066 072 059 055 053 057 066 066 065 051 054 062 103 091 047 052 062 083 071AU 7312*3122 069 066 065 068 072 096 065
066 065 066 075 065 097 125 113 129 114 100 100 082 083 078 075 072 064 069 068 084AU 7312*3123 069 066 065 068 072 096 065
050 066 058 036 065 083 092 097 100 114 094 101 089 069 077 091 097 078

GG-32B

AE HOURLY DIGITAL VALUES

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 11 9-TRACK, 800 BPI TAPES, WRITTEN IN ASCII. THERE ARE TWO RESTORED TAPES. FILES 1-6 ON DR004759 ARE WRITTEN IN AN UNKNOWN FORMAT, AND FILES 7-9 ON DR004759 ARE WRITTEN IN AE FORMAT AND FILES 10-11 ON DR004759 ARE WRITTEN IN AU FORMAT. ALL OF DR004760 IS WRITTEN IN AE FORMAT. 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 THEY WERE RESTORED ON THE IBM 9021. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR004759	DS004759	D000102	1-6	07/01/57 - 12/31/68
		D023726	7	07/01/57 - 12/12/73 (a)
		D030718	8	01/01/66 - 12/31/66 (b)
		D030719	9	01/01/67 - 12/31/67
		D030720	10	01/01/68 - 12/31/68
		D030721	11	01/01/69 - 12/31/69
DR004760	DS004760	D030722	1	01/01/70 - 12/01/70
		D030723	2	01/01/71 - 12/31/71
		D030724	3	01/01/72 - 12/31/72
		D030725	4	01/01/73 - 12/31/73
		D030726	5	01/01/74 - 12/31/74 (c)

(a) I/O ERROR FILE 1, RECORDS 33, 87, 96, 105, 137, 154

(b) I/O ERROR FILE 1, RECORD 506

(c) I/O ERROR FILE 1, RECORD 2334

AE Hourly Digital Values

GG-32B

These are additions to catalog #38. They are 800BPI, 9 track
one file per tape, written in ASCII.

D#	C#	TIME SPAN
-----	-----	-----
D-30718	C-19819	01/01/66 - 12/31/66
D-30719	C-19820	01/01/67 - 12/31/67
D-30720	C-19821	01/01/68 - 12/31/68
D-30721	C-19822	01/01/69 - 12/01/69
D-30722	C-19823	01/01/70 - 12/31/70
D-30723	C-19824	01/01/71 - 12/31/71
D-30724	C-19825	01/01/72 - 12/31/72
D-30725	C-19826	01/01/73 - 12/31/73
D-30726	C-19827	01/01/74 - 12/31/74
* D-23726	C-17822	07/01/57 - 12/13/73

* This tape is 9 track, 6250 BPI, ASCII, one file originally
created on an IBM 360 computer. It was unblocked to 120
byte records having extra bytes removed. Data blocks of 2404
were checked for validity of extra bytes before removal.

AE HOURLY DIGITAL VALUES

<u>CARD COLUMN</u>	<u>DESCRIPTION</u>	<u>REMARKS</u>
1-3	STATION ID	
4-7	YEAR, MONTH	
8	'*'	FLAG SIGNIFYING DH DATA
9-10	DAY	
11-12	HOURL	
13-24	FILLER OF ZERO'S	
25-145	OH VALUES	24 5-DIGIT VALUES (THESE 5-DIGIT VALUES ARE COBOL SIGNED FIELDS. THEREFORE USE OF A COBOL PROGRAM IN READING THESE TAPES IS RECOMMENDED)
146-150	MEAN VALUE	ALSO A SIGNED FIELD 'S9(5)

Tapes are blocked 32 logical records per physical record

9 track, 800, ASCII, odd, 1 file

APPENDIX B. CHARACTER CODES

ASCII		CARD CODE		EBCDIC		COMPRESSED ALPHA-NUMERIC		TTY		LINE PRINTER	
ASCII CHAR.	HEX. CODE	029 KEY PUNCH SYMBOL	ANSI CODE	CHAR.	HEX. CODE	COMP. CHAR.	CAN CODE	TTY	HEX. CODE	L.P. SYMBOL	HEX. CODE
NUL	00	M.P.	12-0-9-8-1	NUL	00			NUL	80		
SOH	01	M.P.	12-9-1	SOH	01			SOM	81		
STX	02	M.P.	12-9-2	STX	02			EOA	82		
ETX	03	M.P.	12-9-3	ETX	03			EOM	83		
EOT	04	M.P.	9-7	EOT	37			EDT	84		
ENQ	05	M.P.	0-9-8-5	ENQ	2D			WRU	85		
ACK	06	M.P.	0-9-8-6	ACK	2E			RU	86		
BEL	07	M.P.	0-9-8-7	BEL	2F			BEL	87		
BS	08	M.P.	11-9-6	BS	16			FE ₀	88		
HT	09	M.P.	12-9-5	HT	05			HT	89		
LF	0A	M.P.	0-9-5	LF	25			LF	8A		
VT	0B	M.P.	12-9-8-3	VT	0B			VT	8B		
FF	0C	M.P.	12-9-8-4	FF	0C			FORM	8C		
CR	0D	M.P.	12-9-8-5	CR	0D			RETURN	8D		
S0	0E	M.P.	12-9-8-6	S0	0E			S0	8E		
SI	0F	M.P.	12-9-8-7	SI	0F			SI	8F		
DLE	10	M.P.	12-11-9-8-1	DLE	10			DC0	90		
DC1	11	M.P.	11-9-1	DC1	11			X-ON	91		
DC2	12	M.P.	11-9-2	DC2	12			TAPE	92		
DC3	13	M.P.	11-9-3	DC3	13			X-OFF	93		
DC4	14	M.P.	9-8-4	DC4	3C			TAPE	94		
NAK	15	M.P.	9-8-5	NAK	3D			ERROR	95		
SYN	16	M.P.	9-2	SYN	32			SYC	96		
ETB	17	M.P.	0-9-6	ETB	26			LEM	97		
CAN	18	M.P.	11-9-8	CAN	18			S0	98		
EM	19	M.P.	11-9-8-1	EM	19			S1	99		
SUB	1A	M.P.	9-8-7	SUB	3F			S2	9A		
ESC	1B	M.P.	0-9-7	ESC	27			S3	9B		
FS	1C	M.P.	11-9-8-4	S4	9C			FS	1C		
GS	1D	M.P.	11-9-8-5	GS	1D			S5	9D		
RS	1E	M.P.	11-9-8-6	RS	1E			S6	9E		
US	1F	M.P.	11-9-8-7	US	1F			S7	9F		
SPACE	20	SPACE BAR	(NO PUNCH)	SPACE	40	SPACE	0	SPACE	A0	SPACE	20
!	21		12-8-7	!	4F			!	A1	!	21
"	22	"	8-7	"	7F			"	A2	"	22
#	23	#	8-3	#	7B			#	A3	#	23
\$	24	\$	11-8-3	\$	5B	\$	39	\$	A4	\$	24
%	25	%	0-8-4	%	6C			%	A5	%	25
&	26	&	12	&	50			&	A6	&	26
'	27	'	8-5	'	7D			'	A7	'	27
(	28	(	12-8-5	(	4D			(	A8	(	28
)	29	)	11-8-5	)	5D			)	A9	)	29
*	2A	*	11-8-4	*	5C			*	AA	*	2A
+	2B	+	12-8-6	+	4E			+	AB	+	2B
,	2C	,	0-8-3	,	6B			,	AC	,	2C
-	2D	-	11	-	60			-	AD	-	2D
.	2E	.	12-8-3	.	4B		38	.	AE	.	2E
/	2F	/	0-1	/	61			/	AF	/	2F

M.P.=Multi-punch (No symbol)

ASCII		CARD CODE		EBCDIC		COMPRESSED ALPHANUMERIC		TTY		LINE PRINTER	
ASCII CHAR.	HEX. CODE	029 KEY PUNCH SYMBOL	ANSI CODE	CHAR.	HEX. CODE	COMP. CHAR.	CAN CODE	TTY	HEX. CODE	L.P. SYMBOL	HEX. CODE
0	30	0	0	0	F0	0	27	0	B0	0	30
1	31	1	1	1	F1	1	28	1	B1	1	31
2	32	2	2	2	F2	2	29	2	B2	2	32
3	33	3	3	3	F3	3	30	3	B3	3	33
4	34	4	4	4	F4	4	31	4	B4	4	34
5	35	5	5	5	F5	5	32	5	B5	5	35
6	36	6	6	6	F6	6	33	6	B6	6	36
7	37	7	7	7	F7	7	34	7	B7	7	37
8	38	8	8	8	F8	8	35	8	B8	8	38
9	39	9	9	9	F9	9	36	9	B9	9	39
:	3A	"	8-2	"	7A	:	37	:	BA	:	3A
;	3B	;	11-8-6	;	5E			;	BB	;	3B
<	3C	<	12-8-4	<	4C			<	BC	<	3C
=	3D	=	8-6	=	7E			=	BD	=	3D
>	3E	>	0-8-6	>	6E			>	BE	>	3E
?	3F	?	0-8-7	?	6F			?	BF	?	3F
@	40	@	8-4	@	7C			@	C0	@	40
A	41	A	12-1	A	C1	A	1	A	C1	A	41
B	42	B	12-2	B	C2	B	2	B	C2	B	42
C	43	C	12-3	C	C3	C	3	C	C3	C	43
D	44	D	12-4	D	C4	D	4	D	C4	D	44
E	45	E	12-5	E	C5	E	5	E	C5	E	45
F	46	F	12-6	F	C6	F	6	F	C6	F	46
G	47	G	12-7	G	C7	G	7	G	C7	G	47
H	48	H	12-8	H	C8	H	8	H	C8	H	48
I	49	I	12-9	I	C9	I	9	I	C9	I	49
J	4A	J	11-1	J	D1	J	10	J	CA	J	4A
K	4B	K	11-2	K	D2	K	11	K	CB	K	4B
L	4C	L	11-3	L	D3	L	12	L	CC	L	4C
M	4D	M	11-4	M	D4	M	13	M	CD	M	4D
N	4E	N	11-5	N	D5	N	14	N	CE	N	4E
O	4F	O	11-6	O	D6	O	15	O	CF	O	4F
P	50	P	11-7	P	D7	P	16	P	D0	P	50
Q	51	Q	11-8	Q	D8	Q	17	Q	D1	Q	51
R	52	R	11-9	R	D9	R	18	R	D2	R	52
S	53	S	0-2	S	E2	S	19	S	D3	S	53
T	54	T	0-3	T	E3	T	20	T	D4	T	54
U	55	U	0-4	U	E4	U	21	U	D5	U	55
V	56	V	0-5	V	E5	V	22	V	D6	V	56
W	57	W	0-6	W	E6	W	23	W	D7	W	57
X	58	X	0-7	X	E7	X	24	X	D8	X	58
Y	59	Y	0-8	Y	E8	Y	25	Y	D9	Y	59
Z	5A	Z	0-9	Z	E9	Z	26	Z	DA	Z	5A
[	5B	¢	12-8-2	¢	4A			[	DB	[	5B
\	5C	0-8-2	0-8-2	\	E0			\	DC	\	5C
]	5D	!	11-8-2	!	5A			]	DD	]	5D
^	5E	⌞	11-8-7	^	5F			^	DE	^	5E
_	5F	—	0-8-5	—	6D			+	DF	—	5F

M.P.=Multi-punch (No symbol)

ASCII		CARD CODE		EBCDIC		COMPRESSED ALPHANUMERIC		TTY		LINE PRINTER	
ASCII CHAR.	HEX. CODE	029 KEY PUNCH SYMBOL	ANSI CODE	CHAR.	HEX. CODE	COMP. CHAR.	CAN CODE	TTY	CODE	L.P. SYMBOL	HEX. CODE
	60	M.P.	8-1		79						
a	61	M.P.	12-0-1	a	81						
b	62	M.P.	12-0-2	b	82						
c	63	M.P.	12-0-3	c	83						
d	64	M.P.	12-0-4	d	84						
e	65	M.P.	12-0-5	e	85						
f	66	M.P.	12-0-6	f	86						
g	67	M.P.	12-0-7	g	87						
h	68	M.P.	12-0-8	h	88						
i	69	M.P.	12-0-9	i	89						
j	6A	M.P.	12-11-1	j	91						
k	6B	M.P.	12-11-2	k	92						
l	6C	M.P.	12-11-3	l	93						
m	6D	M.P.	12-11-4	m	94						
n	6E	M.P.	12-11-5	n	95						
o	6F	M.P.	12-11-6	o	96						
p	70	M.P.	12-11-7	p	97						
q	71	M.P.	12-11-8	q	98						
r	72	M.P.	12-11-9	r	99						
s	73	M.P.	11-0-2	s	A2						
t	74	M.P.	11-0-3	t	A3						
u	75	M.P.	11-0-4	u	A4						
v	76	M.P.	11-0-5	v	A5						
w	77	M.P.	11-0-6	w	A6						
x	78	M.P.	11-0-7	x	A7						
y	79	M.P.	11-0-8	y	A8						
z	7A	M.P.	11-0-9	z	A9						
{	7B	M.P.	12-0	{	C0						
	7C	M.P.	12-11		6A						
}	7D	M.P.	11-0	}	D0						
~	7E	M.P.	11-0-1	~	A1						
DEL	7F	M.P.	12-9-7	DEL	07			RUB OUT	FF		

M.P.=Multi-Punch (No-Symbol)

008F0009CTI 7112*312300000000000000000000004N0004P0004N0004N0003P0003!0002N0002K0002!0002!0002!0002!0002K
0002K0002N0002N0002P0003K0003K0003N0004!0004!0004!0003P0003JUE 7112*312300000000000000000000P0000R0001
!0001J0001K0001K0001K0001K0001!0000P0000000000000000R0000R0000N0000N0000L0000B0000000000A0000L0000L000
0J0000<00000

***** JOB DONE.
\$ASS IN MS4 OUT MS2
\$EXE DUPCOM B5

D-30724
1/1/72-12/31/72

[illegible]

SEXEC LIST BS

D-30725

D-36725

1/1/73-12/31/73

A0004E0004C0003F0003A0003A0002I0002I0003F0003E0003BLR 7312*3122 0009A0007G0006H0006H000
6B0005G0006B0005G0006E0006E0005F0005C0005C0005G0004H0004H0005G0004D0004H0005I0006B0005G0005G0005D00
05INAS7312*3122 0005B0005E0005H0006D0006F0006E0006F0007E0006A0005I0007B0006A0005I0006A0
007A0007A0008B0008C0007H0007E0007B0006D0006I0006H0006GTI 7312*3122 0005R0005P0005K0005K
000400040004M0004K000300003M0003L0003!0002R0002R0003J0003K0002R0002N0002J000200002!00010000100001
P0003MUE 7312*3122 0001M0001K0001K0001K0001L0001J0001!0001M0000R0000M0000K0000J0000J000
5A0000A0000B0000<0000L0000000000000001!0001!0001!0001J0000PAI 7312*3123 0003J000100001K00
01!0003P000100000Q0002P0003!000300006R0004!0003P0010L0013N0010P000800010M0008M0004M0007K0007N000500
005!0005MBW 7312*3123 0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I
0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I
K0005M0010J0007M0005K0014K000500010J0009L0018R001200017K0024L0009K0015N0014N0017J0007K0007!0003R000
1!0000K0010J00 7312*3123 0001J0001K000100002!0002L0002K0000P0001!0001J0000M0001<0000E00
01B0001F0000C0000CH0000E0002M0C01R0000K0001P0001L0001!0001J0000P0I 7312*3123 0003K0001P0
000<0000E0001B0001A0000E0000<0000A0003J0002Q000300005N0007K0006L0012L0010J0010M0009M0007N0011K0005P
0003!0002!0004KFC 7312*3123 0004F0003I0002D0005G0007B0009F0006C0005<0006F0005H0003F0006
E0008C0009B0009G0010<0011D0009D0010A0008I0006I0005I0007G0007A0007B6WR7312*3123 0002F000
2F0002E0002A0004H0003A0004H0003C0004A0002E0003B0004A0004E0005B0005H0005I0006F0005F0005E0005I0005A00
05D0005<0004G0004DLR 7312*3123 0006F0006F0006E0006H0003C0007C0004D0002H0003D000260002E0
000A0002A0001L0001L0001H0003F0002H0006E0008B0006C0007G0009A0009G0004ENAS7312*3123 0006I
0006F0006A000560005E0004B0006E0004E0004I0004C0003A0002F0001G0003A0002B0002C0003A0001<0002D0002H0001
60001G0002B0002C0003FTI 7312*3123 00010000100001P000100001L0001L0001J0001M0000P0001M000
0J0000N0000P0000M0000<0000R0001L0001N0001L0001!0001!0001K0001!0000P0001JUE 7312*3123 00
00P0000R000000000R0000Q0001N0000P0000M0001J0000P0001K0001K0000N0000<0000M0000<0000R0000K0001!0000P0
000M0000M0000M0000M0000P

***** JOB DONE.
\$NOTE EOJ 16:13:50

0-30726

D. 30724

1/1/74-12/31/74

```
TAPE NO.    1          FILE NO.    1  
RECORD      3012       LENGTH     1200  
C0 7412*3123         0001C0003A0001C0001A0001A0001A0000I0001A0001A0001A0001A0G01A0001A0001A0001  
A0001A0001A0001A0001A0001A0001A0001A0001A0001A0001BBI 7412*3123        0000J0002N0004J00003K000
```

006E0007B0007B0006C0005I0006E0007D0006H0007F0007G0005DGWR7412*3123 0001F0001E0001E0002D
0002H0002G0002C0001I0001B0001C0002C0002F0003C0003D0003D0003D0003F0003F0004I0006A0006A0006I0007E0007
C0003ELR 7412*3123 0000F0000M0000R0000R0000R0000P0000E0001H0002A0001D0000L0001!0003K000
5Q0008K0009P0006P0002C0005H0001E0008!0012M0010Q0008!0002ONAS7412*3123 0001B0001B0001B00
01D0001B0001B0001B0001C0001D0001D0001C0001B0000H0000H0001B0000H0001C0001D0000F0000F0000F0000B0000D0
000D0001CTI 7412*3123 0002C000TH0001G0001F0001F0001G0001H0001H0002C0002C0001D0001C0000G
0000E0001C0001C0000F0001C0001E0001C0000G0001E0001D0001DUE 7412*3123 0000M0000C0000
D0000D0000C0000C0000C0000G0000A0000R0001L0000Q0001J0000M0000L0000L0000N0000D0000L0000N0000N0000M000
0J0000C0000K

***** JOB DONE.

\$NOTE E0J 15:38:22

\$WE0 LPS

\$NOP
\$NOP
\$NOP ***** BR1020 *****
\$EXE TPLIST BS

INPUT PARAMETERS ARE: AS SR=1=12 1 1 1

NEW D-23726
unblocked, 120 byte records
9TK, 6250, ASCII

TAPE NO. 1 FILE NO. 1
RECORD 1 LENGTH 12
AE 5707*01 113812781270104811501304 796 724 931 175 67 65 72 63 75 47 47 68 215 21
7 219 71 46 51 464

TAPE NO. 1 FILE NO. 1
RECORD 2 LENGTH 12
AE 5707*02 84 75 65 58 52 37 35 38 60 195 340 464120515281094 954 877 849 549 53
9 389 112 77 10 47

TAPE NO. 1 FILE NO. 1
RECORD 3 LENGTH 12
AE 5707*03 65 259 813 327 142 71 180 51 79 143 199 488 596 246 47 60 70 84 153 24
5 248 91 128 131 215

TAPE NO. 1 FILE NO. 1
RECORD 4 LENGTH 12
AE 5707*04 76 69 66 62 53 31 35 49 47 56 61 56 53 44 39 29 23 49 123 9
2 372 531 756 615 141

TAPE NO. 1 FILE NO. 1
RECORD 5 LENGTH 12
AE 5707*05 305 132 90 68913051163 409 3251079 674 639 869 225 148 129 100 77 100 84 15
1 266 566 695 407 442

TAPE NO. 1 FILE NO. 1
RECORD 6 LENGTH 12
AE 5707*06 133 128 125 116 202 106 124 30 202 98 370 182 178 162 85 136 143 41 79 44
1 457 468 479 462 276

TAPE NO. 1 FILE NO. 1
RECORD 7 LENGTH 12
AE 5707*07 66 71 65 143 279 99 61 69 42 50 47 50 110 271 86 40 30 109 202 30
2 146 66 67 53 175

TAPE NO. 1 FILE NO. 1
RECORD 8 LENGTH 12
AE 5707*08 69 61 115 99 55 63 128 142 94 69 105 91 195 179 167 126 122 91 138 18
4 272 143 50 81 118

TAPE NO. 1 FILE NO. 1
RECORD 9 LENGTH 12
AE 5707*09 202 147 69 100 4 20 34 74 62 78 85 73 66 168 127 151 195 135 111 7
1 121 156 177 128 174

TAPE NO. 1 FILE NO. 1
RECORD 10 LENGTH 12
AE 5707*10 83 94 93 57 49 63 64 33 39 54 73 76 77 66 48 27 27 42 59 6
6 48 44 46 5 57

TAPE NO. 1 FILE NO. 1
RECORD 11 LENGTH 12
AE 5707*11 55 71 61 45 37 27 39 46 62 78 79 68 61 69 45 42 39 58 74 4
9 71 98 51 68 58

TAPE NO. 1 FILE NO. 1
RECORD 12 LENGTH 12

0000<0000L0000L0000K0000J0000J0000J0000K0000K0000K0000J0000K0000K0000K0000L0000L0000L0000L0000
M0000KTI 6612*312200000000000000000000J0000J0000J0000J0000J0000J0000J0000J0000J0000J0000J000
0K0000L0000L0000L0000L0000J0000<0000A0000B0000C0000E0000JUE 6612*3122000000000000000000J0000J0000J00
00J0000J0000J0000K0000L0000L0000M0000M0000M0000M0000M0000M0000L0000L0000M0000N0000M0000<0000D0000C0
000A0000KBW 6612*3123000000000000000000M0000M0000H0001D0001D0001A0000B0000J0000J0000J0000E0000E0001A
0001A0001A0001A0000H0001!0001L0001!0000B0000E0000H0001A0000DCC 6612*31230000000000000000999I0999I0999
I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I099
9I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I099
01N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N0001N00
001R000100001M0001!0000L0000C0000H0001D0001G0001H0001D0000<0001!0001J000000000B0000<0001!0001N0001M
0001J0001K0000MFC 6612*3123000000000000000002<0002<0001H0001G0001E0001C0001B0001A0001<0001H0001E0001
F0001E0001C0001B0000I0000E0000B0000I0001F0001G0001E0001C0001C0001CGWR6612*312300000000000000004C000
4C0004C0004B0003E0003B0003C0003E0003H0004B0003H0002I0002B0002A0002A0003E0003E0002I0002G0003A0003F00
03E0003F0003F0003DLR 6612*312300000000000000000H0000H0000I0000I0001A0001C0001D0001D0001D0001D0001C0
001C0001A0001F0003A0002B0002B0002E0002H0003<0003<0003A0003A0003C0001ISO 6612*31230000000000000000M
0000M0000M0000N0000N0000N0000M0000L0000A0000B0000C0000B0000A0000J0000K0000J0000J0000J0000J0000K0000
K0000K0000K0000K0000KTI 6612*312300000000000000000F0000G0000G0000E0000A0000K0000L0000M0000N00000000
0N0000J0000A0000B0000A0000A0000C0000C0000C0000A0000A0000D0000D0000C0000AUE 6612*3123000000000000000
00L0000L0000J0000A0000<0000L0000M0000L0000M0000N0000M0000A0000C0000A0000K0000J0000A0000J000000000P0
000P0000M0000K0000L0000K

***** JOB DONE.
\$ASS IN MS4 OUT MS2
\$EXE DUPCOM BS

\$JOB 9:02:18
 \$ASS IN MS3 D.30719
 \$REW IN
 \$NOP ***** LIST OF ~~SNIP~~ *****
 \$EXE LIST BS

INPUT PARAMETERS ARE: AS FL 1 1 1

TAPE NO.	1	FILE NO.	1
RECORD	1	LENGTH	4800

[illegible]

TAPE NO.	1	FILE NO.	1
RECORD	2669	LENGTH	2400

C0 6712*312200000000000000009A0006J0003L000200003P0001R0001E0003H0004E0004A0004H0004B0001I0002<0000

D-30719
1/1/67-12/31/67

99IFC 6712*31220000000000000000000500005P0006J0006Q0007J0007J0006Q0006!0005!00040000400004P0005M0006!0
006!0005R000500005!0004P0004P0004L0003R0004!0004J0005MGWR6712*3122000000000000000004R0005R0007M0012M
0006!0009R0001H0006A00090001200006F0001E0000P000100004R0005L0004N0003J0002M0002N0003R0003R0003N0003
!0002!LR 6712*312200000000000000000012C0013E0012F0011G0007A0010F0007H0005B0003H0006D0005E0001G0006!001
1000160002200028M0026J0012N0004N0006N0006000006K0006!0002LS0 6712*312200000000000000000012R0013M0011N00
10L0013M0015R0014R0015M0015K0012J0009P0008!0009P0011!0014L0016P0014M0011Q0011K0013K0016K0013Q0014K0
015M0013JUE 6712*312200000000000000000017!00140001200010R0009N0008J0006R0005P0004N0003Q0003Q0004!0004Q
0006M0007R0008Q0009M0009P0009000008R00070000600006R0008J0008KBW 6712*3123000000000000000005K0004N0003
Q0004L0006J0007Q0007J0005K0004J0004J0004N0005P0005M0004N0003Q0004J0005M0006Q00060005P0005M0005R000
7L0007N0005NCC 6712*31230000000000000000001A0000L0000N0000<0000J0000P0000J0001<0001C0000G0000P0000L00
01<0001C0000G0000F0001B0001<0000D0001<0001E0000<0001R0003N0000BC0 6712*3123000000000000000001A0000B0
000N0001B000200001H0003I0004C0003H000760008F0006F0005F0005F0008I0007E000960007B0006<0007<0006C00046
0003H000260004HDI 6712*31230000000000000000999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999I0999
I0999
4R0005N0006!00060000700008N0009M0011!0013J0015!0015N00140001200011!0009R0009L0008M0006P0005M0005L00
05L0005L0005M000806WR6712*31230000000000000000999I0999I000400006L0006M0006M0005P0010M0016P002500026P0
009P00050002300061!0029P0014R000800003K0004N0003P0003N0004N0005P0013JLR 6712*3123000000000000000005P
00050005R0006N0007M0009M001100013M0014N0015R0019M0023R002900015J0011P0018N001900026Q0028K0023R0015
L0006K0009L0015L0014RS0 6712*312300000000000000000015Q0016L0015K0015N001700019K0022P0024Q0023M0021P002
100023K0022!0019K0017L0016J0016P0014P0014N00160002000022L0023K002600019NUE 6712*31230000000000000000
08R0008M0007J0006J0006L0007N0007N0006K000400003!0001Q0001N0001L0001J0001J0001!000000000A0000H0001E0
002<0002C000200002B00020

***** JOB DONE.
\$ASS IN MS3 OUT MS1
\$EXE DUPCOM BS

D-30720
1/1/68-12/31/68

FILE NO. 1

LENGTH 48.00

J0029R0035M0037R0040!0046L0045Q0040Q0039L0042R00270BW 6801*01000000000000000004K0004R0005L0004R000
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FILE NO. 1

LENGTH 3600

[illegible]


```
***** JOB DONE.  
$NOTE EOJ      20:03:27  
$ASS IN MS3 OUT MS1  
$EXEC DUPCOM 35
```

FORMAT OF 2.5 MINUTE TAPE RECORDS FORTRAN COMPATIBLE RECORDS

Position	
1-3	Observatory mnemonic code
4-5	Year; 1.e., 64 } GMT
6-7	
8	Month; 01 to 12 }
9	Element; D, H, Z, X, or Y
9-10	
11-12	Day; 01 to 31 } GMT
13-16	Hour; 00-23 }
17-20	Arbitrary
21-116	Either zero, or the tabular base in degrees for D, in hundreds of gammas for the intensity elements
117-120	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 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)

Page

SAMPLE COMPUTATIONS SHOWING USE OF TABULAR BASES

	D	H	Z	X	Y
Tabular Base	-006	155	-435	-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.		Geomagnetic Coord.		LGM** UT
		N. Lat. ^o	Long. ^o	N. Lat. ^o	E. Long. ^o	
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 Wullen, Tixie Bay and Dixon Island

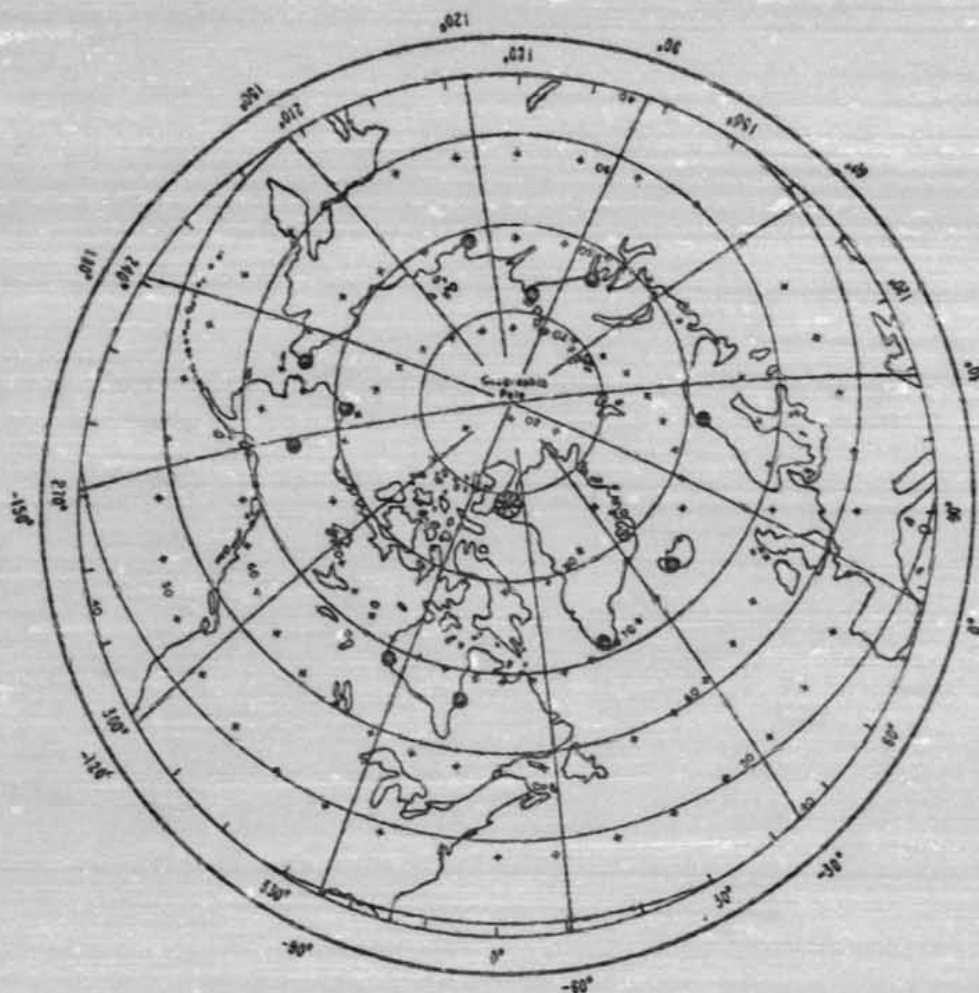


Fig. 1 - Stations contributing to 1970 AE(11) are shown by solid filled circles.
 Polar equal-area projection centered on north geomagnetic pole  with geographic and geomagnetic coordinate grids.

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 S_q 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 EPI, 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 3 - Hourly mean AC 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						
0	1	60	122	130	61	200	162	63	26	14	17	14	16	21	35	33	36	45	40	61	37	46	94	279	422	83					
0	2	281	97	70	181	323	197	203	178	184	306	311	442	473	227	46	61	160	326	306	586	422	270	330	534	271					
0	3	261	244	101	78	117	51	28	41	35	85	127	136	197	67	32	57	28	24	26	22	16	25	27	22	75					
0	4	22	41	39	33	27	30	76	92	207	376	156	201	315	474	359	160	369	597	370	195	163	252	131	133	232					
0	5	166	193	178	203	160	140	53	42	65	60	62	76	203	102	323	121	121	149	77	52	86	125	298	245	145					
0	6	121	88	96	54	76	63	32	125	99	88	30	22	22	20	23	24	26	47	79	45	34	20	14	16	52					
0	7	19	20	17	15	12	16	17	19	21	27	26	26	29	29	25	20	16	13	14	26	25	23	24	16	28					
0	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					
0	9	21	22	41	46	21	42	68	40	31	31	25	33	43	45	110	193	134	119	79	36	34	29	25	24	54					
0	10	24	21	19	24	46	33	72	54	40	21	18	16	24	49	108	417	491	476	394	58	63	47	52	43	109					
0	11	30	25	24	19	27	32	33	61	112	63	28	20	29	30	28	57	96	78	50	37	24	43	19	12	42					
0	12	26	31	22	19	19	14	16	17	10	24	23	22	23	36	31	40	43	41	42	20	26	30	31	29	27					
0	13	23	25	25	26	36	64	28	28	21	27	26	40	138	222	183	38	32	26	34	22	24	21	27	29	49					
0	14	35	39	109	315	216	199	64	44	45	100	324	427	156	178	289	332	283	166	50	48	40	42	34	38	150					
0	15	38	47	123	114	193	230	253	217	142	126	346	163	38	47	69	155	96	177	250	216	63	58	47	48	133					
0	16	43	35	36	34	24	33	46	164	178	96	82	176	218	188	384	139	48	32	31	33	35	65	37	85	32					
0	17	32	25	33	32	27	24	15	18	23	40	201	172	79	40	37	74	252	506	491	555	173	324	286	156	159					
0	18	69	92	129	91	205	94	78	198	132	85	60	176	63	282	528	188	53	56	105	88	93	83	205	149	137					
0	19	93	117	35	22	20	24	27	52	37	27	36	134	165	61	63	66	61	30	27	35	34	41	35	49	54					
0	20	35	26	21	24	24	24	23	22	22	31	41	38	43	52	213	189	65	47	34	65	44	31	32	30	50					
0	21	26	22	34	30	17	29	26	41	50	42	29	31	36	35	29	27	26	34	20	22	51	31	20	34	32					
0	22	27	31	33	34	23	26	25	24	23	25	31	26	37	48	34	40	35	33	61	55	63	34	32	31	36					
0	23	26	24	22	21	16	16	23	22	20	23	26	30	36	31	29	32	29	36	27	22	32	31	26	26	26					
0	24	21	22	32	13	31	20	32	159	148	34	150	94	35	40	62	211	822	714	316	63	63	39	37	37	141					
0	25	34	61	48	24	15	41	65	53	28	29	29	26	29	26	31	54	97	93	31	25	15	22	26	22	38					
0	26	33	103	162	125	136	183	294	373	331	349	511	526	664	674	525	323	77	189	44	28	23	37	29	34	235					
0	27	31	29	21	23	42	92	121	182	225	215	227	271	168	210	162	81	132	278	78	66	202	475	353	397	107					
0	28	487	508	397	184	67	158	207	303	339	159	256	483	483	416	194	188	308	386	459	216	56	111	78	245	274					
MEAN	72	73	70	73	75	73	70	94	93	89	115	134	134	134	162	142	123	145	169	114	101	81	86	35	136	104*					
50 MEAN	25	23	25	24	19	24	25	34	46	37	27	24	30	36	38	38	50	68	97	35	58	47	37	31	26	35					
50 MEAN	169	141	126	162	131	119	116	155	185	194	239	326	291	266	192	146	308	448	313	288	155	139	122	231	236						

* THIS MEAN (104 GMMAS) 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	547	420	418	297	480	882	562	170	122	91	95	123	176	147	237	321								
2	283	355	392	236	278	472	195	163	264	538	478	380	112	96	66	129	124	262	132	44	63	46	124	272	227								
3	129	71	89	48	55	74	132	58	346	132	73	43	35	95	185	134	240	604	641	440	332	517	233	121	134								
4	151	143	240	171	97	118	230	123	276	436	361	641	636	585	704	648	500	843	763	597	463	343	240	452	432								
5	198	117	82	68	65	96	164	143	214	436	56	37	35	46	81	121	249	466	732	719	595	477	282	350	223								
6	330	266	230	125	49	36	48	122	423	379	824	263	139	114	221	276	505	592	626	517	737	704	600	738	363								
7	602	455	504	391	350	79	76	218	436	826	610	499	393	384	688	1105	586	768	981	694	265	161	251	535	430								
8	469	429	557	1023	189	1220	689	692	671	414	620	774	586	909	2394	1746	761	642	1158	789	509	474	372	330	822								
9	287	253	611	603	315	189	177	186	200	209	399	440	561	600	463	678	926	684	230	199	141	233	317	416	386								
10	277	88	118	37	30	30	51	104	222	131	145	142	59	31	34	40	124	158	295	247	323	100	42	42	121								
11	40	39	37	39	47	46	41	47	47	43	79	41	43	69	99	48	50	49	49	79	191	198	181	111	59								
12	51	71	145	219	142	112	175	259	239	295	475	363	198	72	45	37	49	45	40	36	31	33	44	40	133								
13	61	37	40	30	46	39	119	272	101	122	417	176	102	272	391	264	108	63	62	116	328	81	38	42	165								
14	52	68	130	51	49	43	33	35	95	48	42	40	36	33	24	26	38	31	23	27	31	34	39	50	44								
15	56	150	160	160	246	304	207	186	75	72	170	98	50	30	167	290	132	55	55	165	156	45	31	34	124								
16	32	37	41	41	42	39	41	44	54	79	142	58	73	95	142	56	39	36	41	35	23	51	47	44	56								
17	45	42	41	50	43	38	69	54	51	50	59	49	54	126	102	93	116	163	314	164	51	57	132	137	43								
18	171	93	44	57	41	36	40	40	48	51	145	324	323	131	48	136	247	89	123	109	129	251	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	717	153	91	88								
20	85	46	41	42	40	33	37	41	43	50	57	136	171	107	65	76	64	61	132	309	94	71	138	120	83								
21	139	165	175	163	76	49	54	44	45	57	53	59	98	53	73	206	203	153	77	54	95	29	33	36	89								
22	46	48	49	46	40	35	33	77	65	51	91	186	114	75	62	40	41	29	24	43	34	24	47	54	97								
23	58	68	57	49	45	45	46	62	176	240	93	53	63	54	81	68	91	72	102	111	53	46	94	60	76								
24	56	51	46	39	44	47	47	68	51	59	57	56	50	48	46	43	46	40	24	22	33	48	50	55	46								
25	60	60	57	64	45	34	59	139	76	51	46	46	53	57	43	46	44	44	46	41	33	37	41	51	53								
26	50	51	106	119	164	142	58	71	89	54	55	79	60	48	59	125	120	103	61	93	94	62	93	50	53								
27	47	47	47	50	42	44	54	56	68	142	204	305	134	120	82	70	77	148	334	352	221	363	735	453	177								
28	229	177	177	460	396	466	465	281	275	554	647	782	413	336	513	544	502	232	178	423	327	308	429	560	413								
29	393	237	362	436	369	215	213	274	208	161	173	213	946	348	385	546	437	460	460	424	321	212	214	336	334								
30	532	98	51	37	84	224	295	272	326	249	419	623	993	393	122	188	839	189	161	114	278	321	132	55	254								
31	49	99	135	256	261	235	364	671	666	931	716	747	342	321	981	629	444	264	168	175	235	149	349	475	346								
MEAN	172	131	159	153	156	193	146	175	211	241	269	282	204	199	301	300	246	239	260	243	205	196	199	239	210*								
SQ MEAN	67	72	74	75	49	41	47	70	59	61	78	79	71	66	73	79	75	60	42	59	37	38	44	48	63								
SD MEAN	335	302	487	520	433	352	275	376	409	432	624	545	406	467	950	928	644	594	636	475	398	375	430	476	495								

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

Table 3 - Station which is major contributor to AU in each hour -- January 1970

[illegible]

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

JANUARY 1970	AL = MINIMUM DELTA H																							
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
UT	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
1	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
2	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
3	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
4	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
5	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
6	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
7	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
8	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
9	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
10	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
11	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
12	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
13	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
14	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
15	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
16	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
17	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
18	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
19	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
20	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
21	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
22	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
23	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
24	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
25	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
26	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
27	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
28	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
29	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
30	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE
31	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE	UE

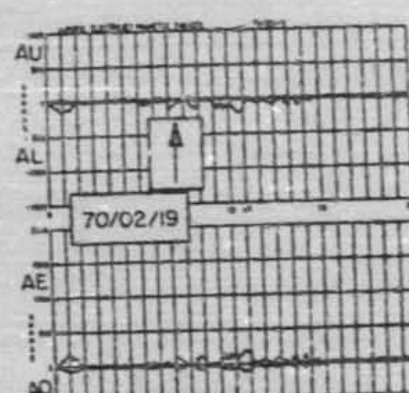
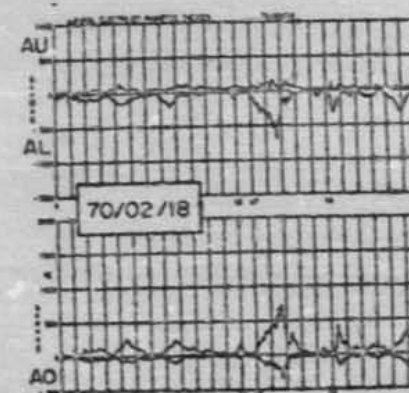
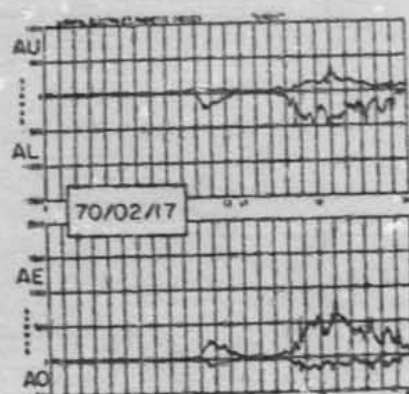
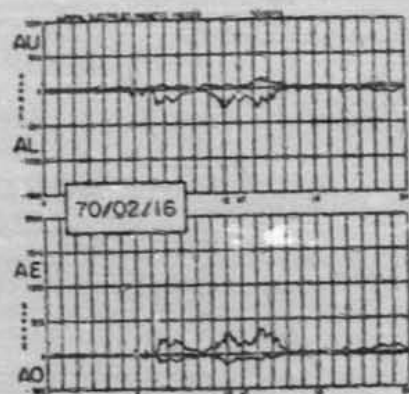
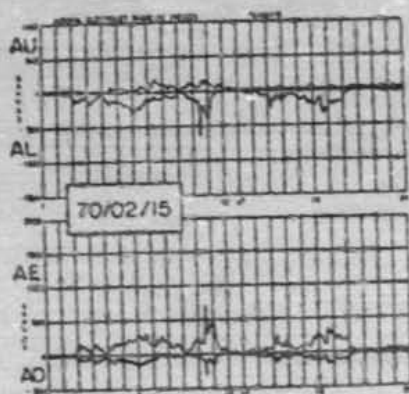
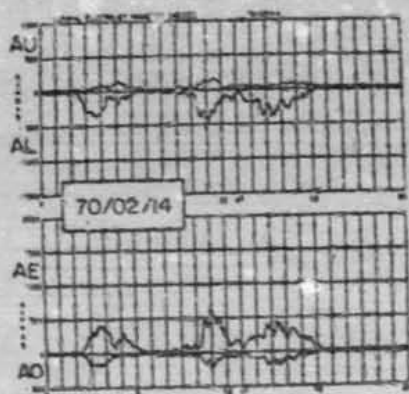


Fig. 2 - Index graphs of AU, AL, AE, AO for February 14-19, 1970

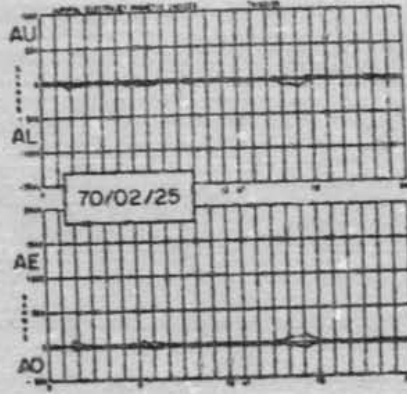
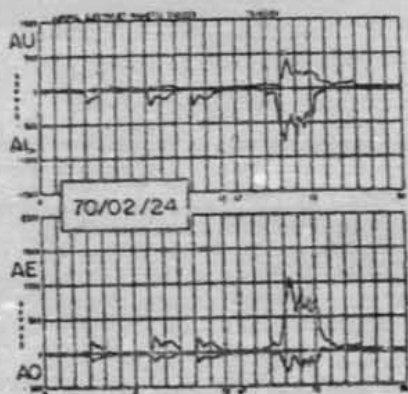
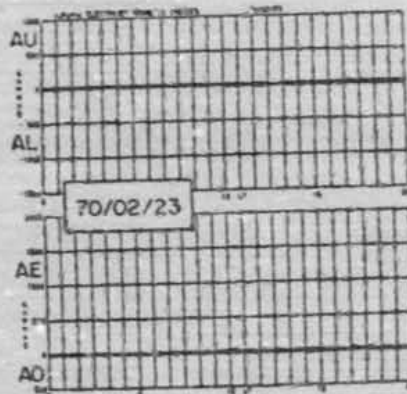
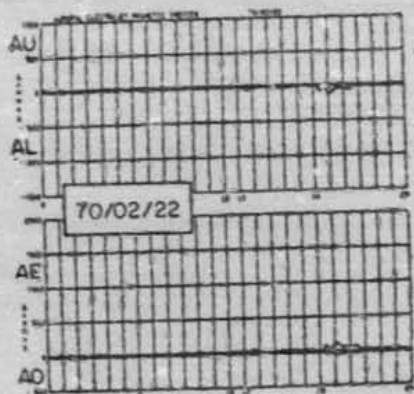
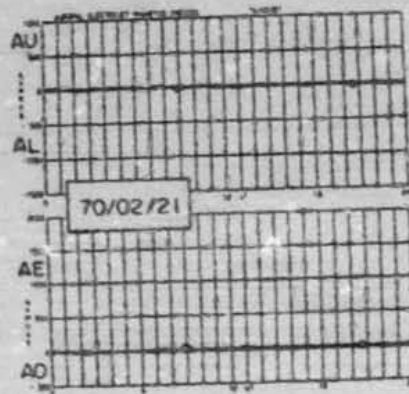
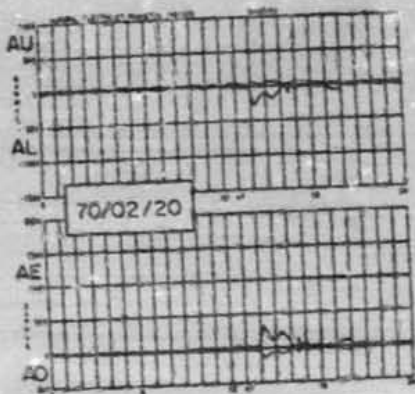


Fig. 3 - Index graphs of AU, AL, AE, AD for February 20-25, 1970

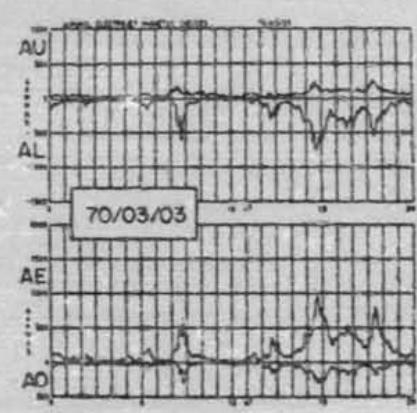
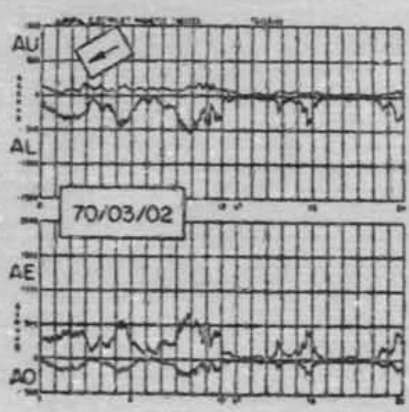
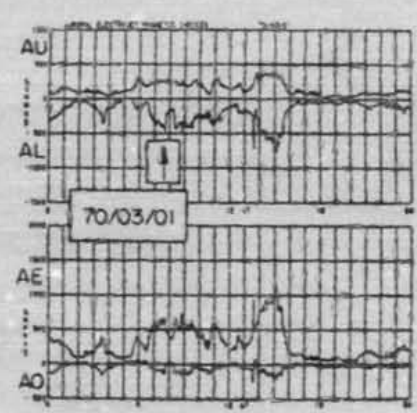
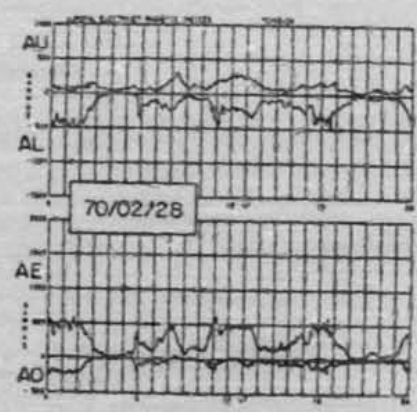
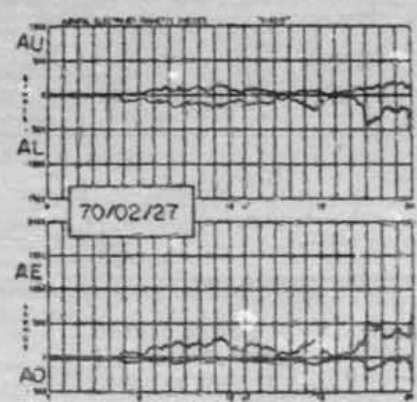
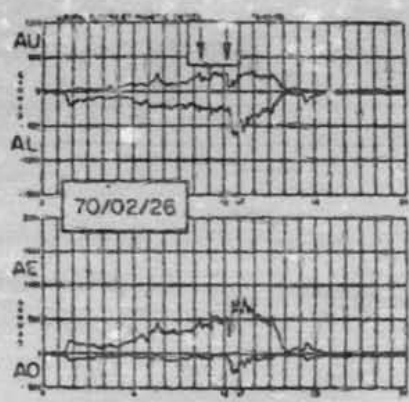


Fig. 4 - Index graphs of AU, AL, AE, AO for February 25 - March 3, 1970

(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, CG, 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

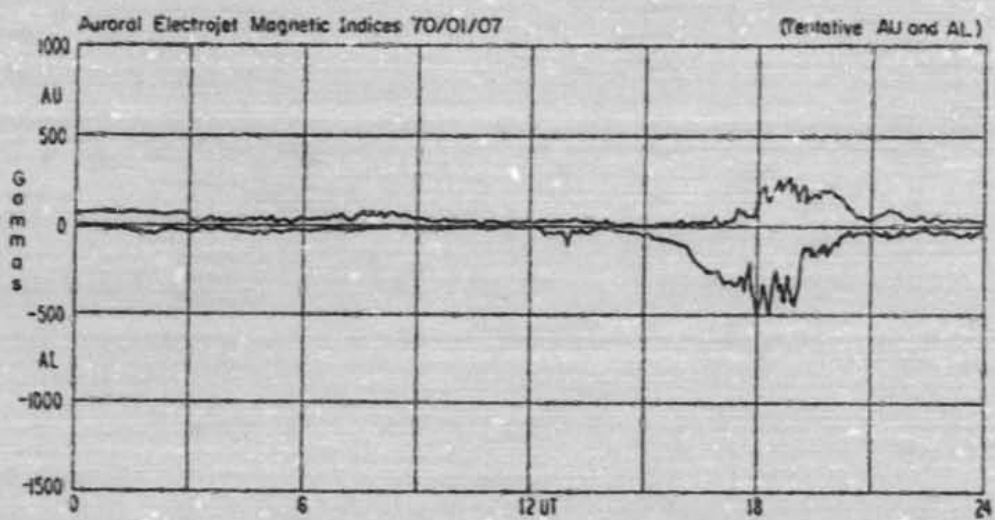
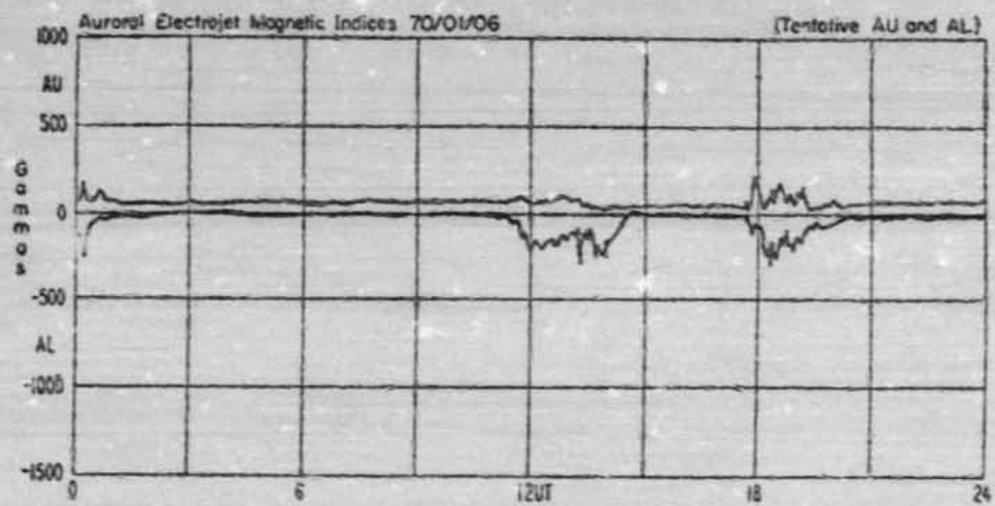


Fig. 5 - Uncorrected index graphs of AU, AL for January 6-7, 1970

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 essential 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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Pudovkin, M. I., O. M. Raspopov and L. A. Dmitrieva, V. A. Troitskaya, and R. V. Shepetnov, The Interrelation Between Parameters of the Solar Wind and the State of the Geomagnetic Field, Ann. Geophys., t. 26, fasc. 2, 389-396, 1970.

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 HSSDC 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 MIX AVG TAPE NUMBERS

	<u>De</u>	<u>Cd</u>
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

	<u>D#</u>	<u>MICROFILM M#</u>
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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Greenbelt, Maryland

VITAL
STATISTICS

October 1968

Extraterrestrial Physics Branch Preprint Series

Introduction I.

An important consequence of the solar wind earth interaction is the production of electric currents in the terrestrial ionosphere whose magnetic effects are recorded on observatory magnetograms. These currents are observed simultaneously over large geographical regions but they are most intense in auroral zone, especially in the midnight hemisphere. The currents flow approximately along parallels of latitude 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 in turn are only the geomagnetic component of the more far reaching magnetospheric substorms, a term designating ill-defined physical processes and their influences on virtually all observable magnetospheric phenomena. To allow better study of 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 wide geomagnetic activity. In recent times, however, increasing understanding of the causes of the various types of geomagnetic fluctuations contributing to Kp along with the advent of high speed computers and high time resolution spacecraft measurements point up the need for more redefined indices to supplement Xp. The Dst index (figure ?) has been defined as a measure of the magnetospheric ring current and

The auroral electrojet (AE) 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} scaled by the US Coast and Geodetic Survey 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.

1. Production of AE

Definition and discussion of the AE index

Definition. A detailed definition and discussion of the AE index has been given by Davis and Sugiure (1966). Briefly, the technique is to superpose K and X components of digitized auroral zone magnetograms 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 encompassing the traces from all the observations. The AE index is defined as the upper envelope (AU) minus the lower envelope (AL). Normally the station near midnight will be the contributors 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 suppressed and the index will represent the universal time dependence of auroral zone geomagnetic activity.

stations near midnight will be the contributors 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 suppressed 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 asymmetry of the currents relative to parallels of geomagnetic latitude. An effect Tixie Bay behaves a more northerly station than Sirka 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 K_p) 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 4 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 kept 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 contributor to the index during very quiet times. Sq currents may thus affect 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 plan is to compile an initial index when a bare minimum of stations (probably Alaska, Canada, Iceland and Scandinavia) ^{have been} 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
Lairvögur	LR	64°11'N	21°42'W	70.2°N	71.0°
Aleks	AI	68°21'N	18°49'W	66.0°N	115.0°
Kiruna	KI	67°50'N	20°25'E	65.3°N	115.7°
Sodankylä	SO	67°22'N	28°39'E	63.5°N	120.0°
Murmansk	MY	68°57'N	33°03'E	64.0°N	126.5°
Dixon Island	DI	73°32'N	80°33'E	63.0°N	161.4°
Cape Chelyuskin	CC	77°43'N	104°17'E	65.5°N	177.5°
Tixie Bay	TI	71°35'N	129°00'E	60.5°N	191.0°
Uelen	UE	66°10'N	169°50'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°
Meenook	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	66.6°N	347.4°

Range Values at Stations 1964

	Station Constant	Average Tabular Value (grams)			
		Sept.	Oct.	Nov.	Dec.
11 - Lefrvoque	11500	540	540	540	540
X - Ktruna	10500	538	538	538	538
H - Nucrangak	11500	248	248	248	248
H - Dixon Island	6000	402	402	402	402
H - Cape Chelyskia	3000	360	360	364	367
H - Tixie Bay	7000	592	592	595	599
H - Uelen		549	552	556	558
H - College	12500y	342	342	342	342
H - Sitka	15000	716	716	716	716
H - Kennok	12500	621	621	621	621
X - Fort Churchill	6000	854	854	854	854

Page Values - AE Statistics 1965

[illegible]

Papa Values - AE Stations 1966

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Ladrovogur	560	562	562	564	570	573	573	573	573	576	579	583
Kiruna	555	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
Meenook	647	651	651	654	657	665	663	663	660	663	665	668
Greenland Whale River	184	190	192	195	204	207	216	222	226			

Rain Values - All Stations 1967

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Letevogur	581	581	531	535	508	591	595	595	595	595	592	592
Kiruna												
Murmansk												
Dixon Island												
Cape Chelyuskin												
Tixie Bay												
Uelen	380	380	380	383	386	386	390	390	390	391	393	395
College	748	748	750	753	753	753	753	753	753	753	755	757
Sitka	668	670	672	672	675	679	681	681	681	681	684	687
Manook												
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 - All Stations 1968

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Lofrvogur	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
Neenook	690	693	693	697	702	706						
Fort Churchill												
Great Whale River	326	332	336	347	355	363						
Sodankyla	883	883	883	883	886							
ABisko			713	716	719	720	720	720	720	720		

FIGURE 2

BINARY TAPE FORMAT #2

<u>SYMBOL</u>	<u>WORD NUMBER</u>	<u>DESCRIPTION</u>
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".

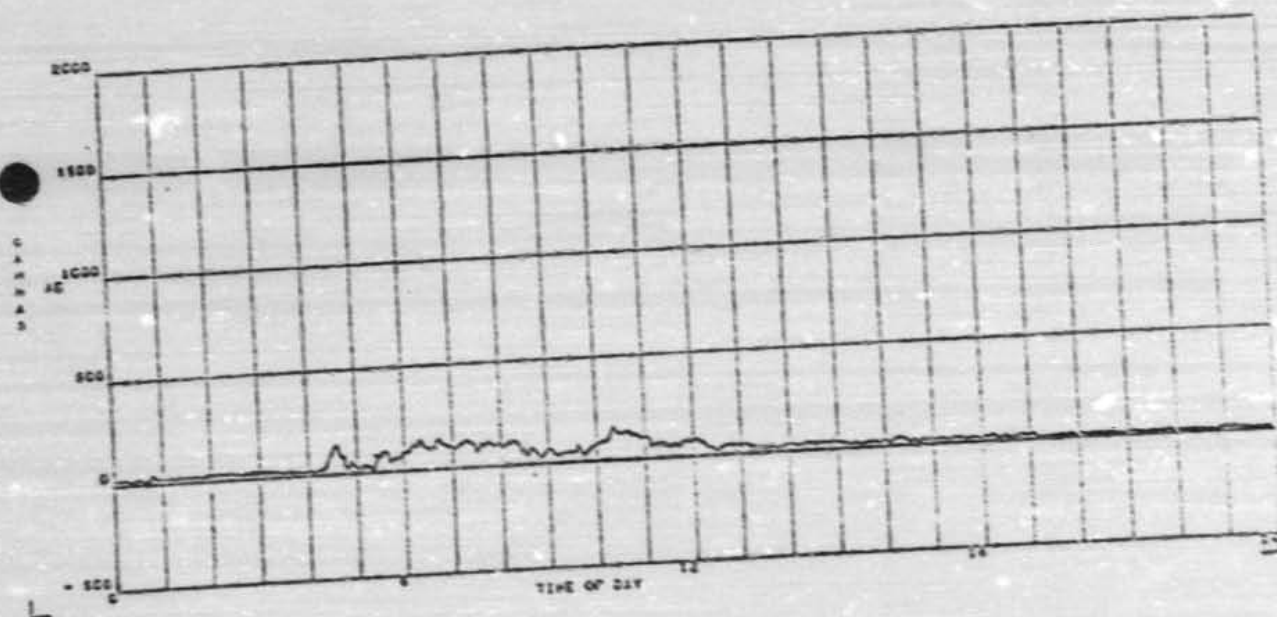
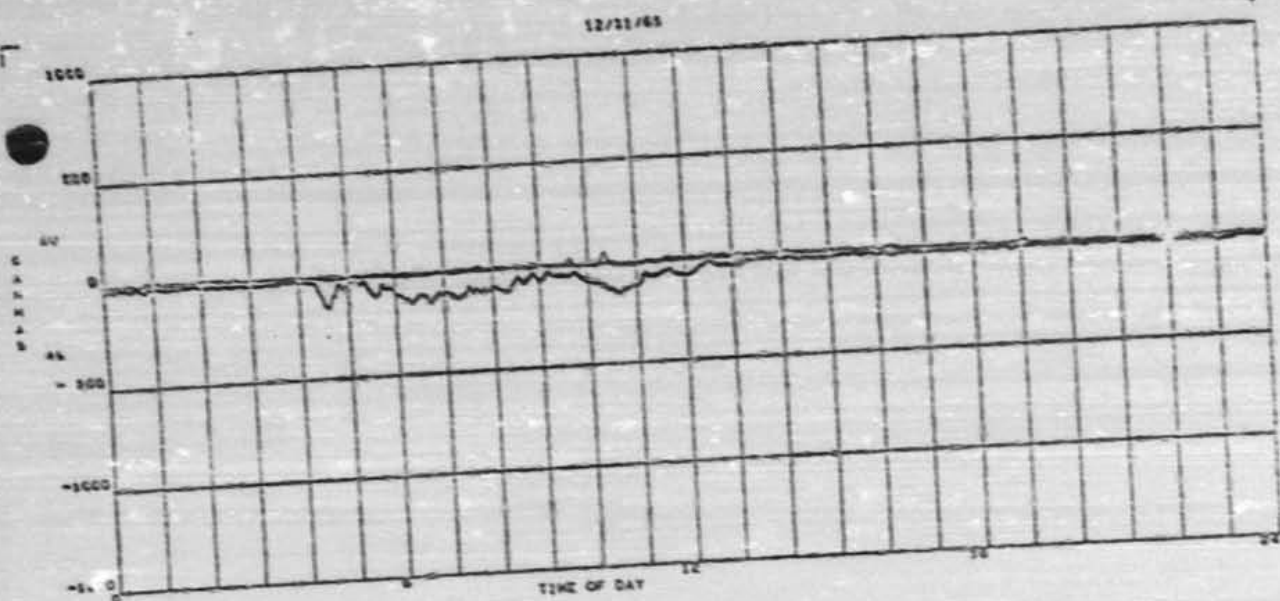


FIGURE 2 PLOTS OF AU, AL AND AE

MINUTES

HOURS 6-11

PAGES 12-17

HOURS 18-23

HOURS 18-23																							
42	43	43	44	45	45	45	44	41	41	43	42	45	45	40	41	38	41	44	49	52	50	57	58
56	53	53	54	57	57	57	57	54	56	58	52	47	47	51	54	49	46	45	42	44	48	45	40
50	59	58	49	46	47	46	52	55	50	49	50	53	30	20	27	21	36	40	33	28	26	27	33
43	47	60	63	58	60	61	52	53	58	54	51	49	45	48	49	50	52	54	54	52	50	43	36
39	38	43	45	46	47	50	50	51	51	51	50	50	49	50	43	39	35	39	42	47	43	37	34
33	35	37	41	44	65	85	97	96	90	70	45	61	83	84	82	88	82	80	89	96	97	98	91

FIGURE 3 AE TABULAR VALUES

<u>SYMBOL</u>	<u>WORD NUMBER</u>	<u>DESCRIPTION</u>
	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

VERSION 12 08 64
AC DATA FOR 1965

S-C 62/14/66
C 368

STA	DERIVED BASE FOR EACH MONTH											
	1	2	3	4	5	6	7	8	9	10	11	12
CO	350.	312.	354.	356.	398.	360.	362.	362.	362.	362.	365.	367.
PC	860.	864.	868.	872.	876.	879.	881.	881.	884.	887.	890.	892.
LR	541.	541.	541.	544.	547.	549.	549.	549.	552.	553.	558.	558.
RT	540.	542.	546.	550.	554.	554.	554.	554.	554.	554.	554.	554.
HE	625.	627.	629.	632.	635.	635.	635.	635.	635.	635.	637.	639.
SI	720.	720.	720.	722.	724.	726.	729.	731.	735.	735.	735.	735.

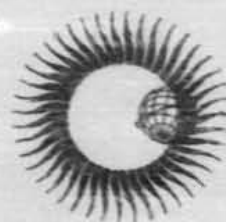
9999. INDICATE NO DATA PROCESSED FOR THE MONTH

FIGURE 5 FORMAT OF MICROFILM HEADER FRAME

**WORLD DATA CENTER A
for
Solar-Terrestrial Physics**



**AURORAL ELECTROJET
MAGNETIC ACTIVITY INDICES
(AE) FOR 1970**



November 1972

RJS 72 DEC 14

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WORLD DATA CENTER A for Solar-Terrestrial Physics



REPORT UAG - 22

AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES (AE) FOR 1970

by

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Environmental Data Service
Boulder, Colorado

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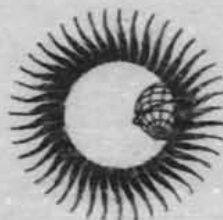


TABLE OF CONTENTS

	Page
ABSTRACT	1
Section I: General Discussion	
1. Introduction	1
1.1 Prior Derivations of AE	1
1.2 Definition and Computation of AE	2
1.3 Station Selection for 1970 AE	2
1.4 Quiet Time Reference Levels	5
1.5 Computation of Indices	5
2. Problems in Derivation of AE	6
2.1 Inherent Problems	6
2.2 Data and Recording Problems	6
2.3 Digitizing Process Problems	7
3. Availability of Indices	7
4. Acknowledgements	8
Section II: Tables	
1. Explanation	10
2. Tables of Adopted Monthly QM Reference Values	11
3. Tables of Hourly Average AE Indices	12
4. Tables of Hourly Average AL Indices	24
5. Tables of Hourly Average AU Indices	36
6. Tables of Hourly Average AD Indices	48
7. Tables Listing Observatories Supplying AU and AL for Each Hour	60
Section III: Graphs of Indices	
1. Explanation	85
2. Graphs of 2.5-min Values of Indices for Each Day	86

AURORAL ELECTROJET MAGNETIC ACTIVITY INDICES (AE) FOR 1970

by

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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 [Allredge, 1969]; the Joint COSPAR-IUCSTP Second Report on IHS [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. W. 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, $\pm H(t)$. 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.		Geomagnetic Coord.		LGM* UT
		N. Lat. ^o	E. Long. ^o	N. Lat. ^o	E. Long. ^o	
1. Leirvogur	LR	64.18	338.30	70.22	71.04	2351
2. Narssarsuaq	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	58.60	265.90	68.70	322.77	0704
5. College	CO	64.67	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. Dixon 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 Vollen, Tixie Bay, and Dixon Island.

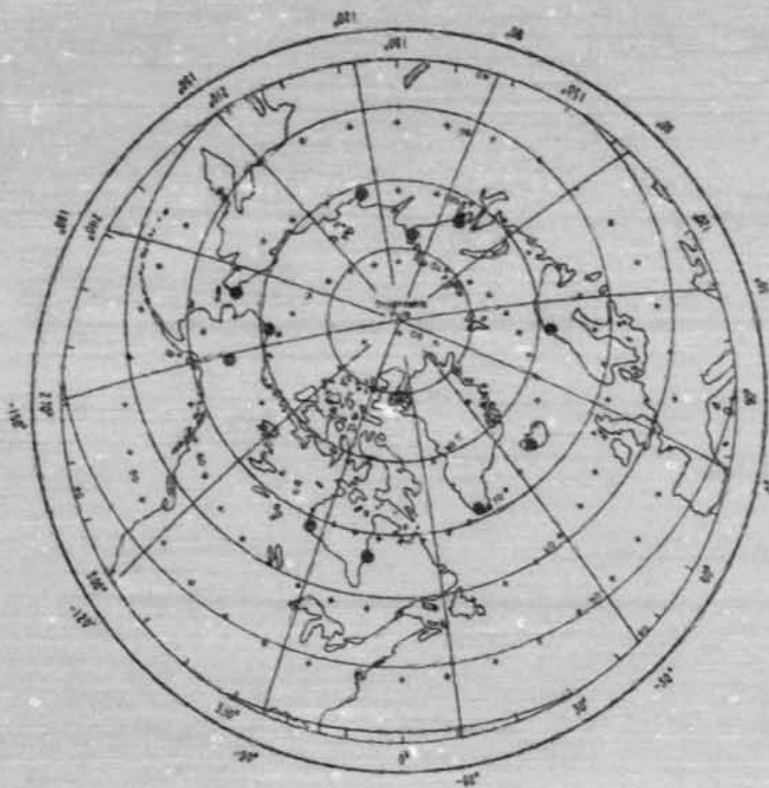


Fig. 1 Stations contributing to 1970 AE(11) are shown by solid filled circles. Polar equal-area projection centered on north geomagnetic pole with geographic and geomagnetic coordinate grids.

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°. Geomagnetic longitude is given by the inner circle of numbers and the border of hash-marks at 100 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 13 γ and the greatest change observed was 40 γ . 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 AQ 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.

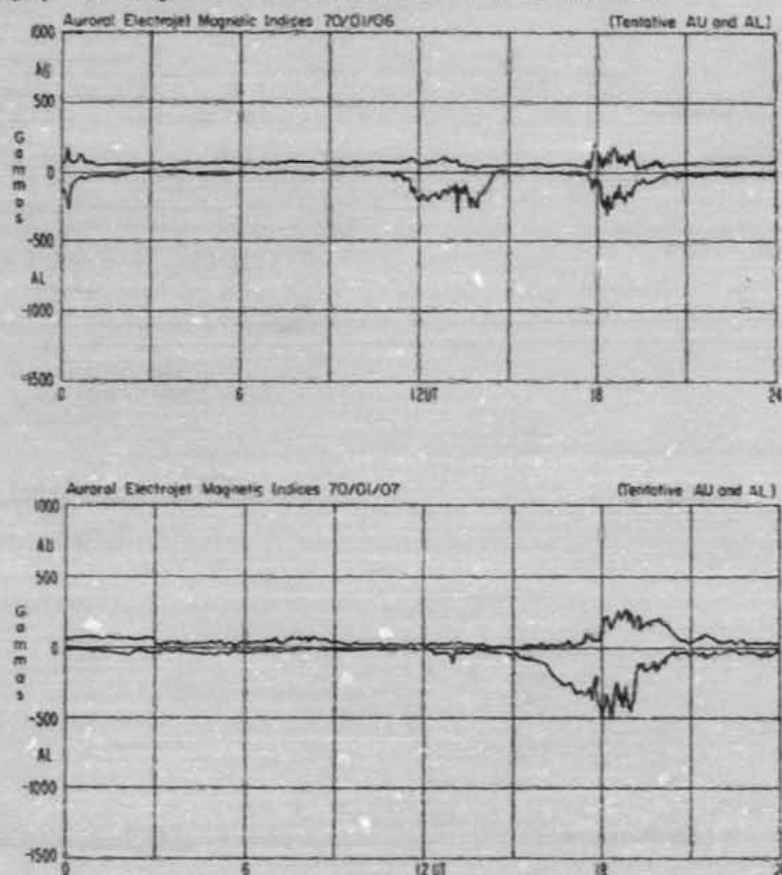


Fig. 2 Uncorrected index graphs of AU, AL for January 6-7, 1970.

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 1-8 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. W. M. Oriatsky, 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 AG. 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 -1000. 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 150 γ) 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 20-60 γ), 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 Narssarsuaq 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
AMISKO	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	12955
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
LEIPVOSUR	1970	12166	12163	12159	12160	12170	12176	12160	12175	12164	12174	12188	12187
NARSARSSUAQ	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 ULEN	1970	14159	14156	14158	14165	14164	14174	14174	14175	14161	14171	14176	14173

VALUES ARE EXPRESSED IN GAMMAS

RE INDICES

JANUARY 1970

MEAN

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
1	33	27	34	38	77	136	86	77	57	35	26	50	174	205	210	120	407	405	150	58	49	67	102	177
2	124	110	175	386	562	400	302	405	625	437	310	495	643	559	431	613	312	391	280	673	362	225	384	397
3	316	187	205	143	117	50	158	208	289	205	196	120	153	253	138	33	46	57	37	31	48	147	81	26
4	38	30	25	52	35	35	62	36	58	91	123	75	51	48	114	151	147	62	40	32	64	133	98	26
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
6	168	45	24	26	62	37	28	28	54	47	49	113	212	225	96	36	33	61	205	118	98	45	30	27
7	29	29	41	35	48	45	54	68	80	50	27	27	58	53	48	79	217	354	517	373	156	114	49	66
8	107	126	73	64	56	51	50	51	67	89	126	151	70	104	74	109	151	199	112	39	34	23	46	87
9	268	235	158	96	105	149	94	131	227	224	182	66	74	47	137	121	181	295	141	44	48	72	135	138
10	159	75	190	64	43	30	26	22	39	36	31	136	78	124	71	26	40	65	63	35	25	19	15	19
11	36	52	71	63	37	45	59	39	30	35	34	55	101	101	173	34	30	25	46	58	52	52	134	170
12	364	188	109	100	73	40	66	113	120	90	99	81	40	32	96	75	97	264	182	81	148	388	155	107
13	60	55	25	24	46	54	41	29	32	31	42	39	38	77	301	388	234	68	31	27	33	39	57	44
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
15	106	135	106	85	150	97	42	41	49	26	26	34	29	27	28	38	52	145	78	34	29	42	91	127
16	129	194	310	159	160	241	200	321	467	429	721	645	570	539	645	584	803	777	540	593	595	503	458	516
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
18	56	204	106	72	108	114	180	191	91	53	90	117	48	48	36	73	195	67	62	34	24	22	40	31
19	37	36	32	30	22	22	20	28	43	57	47	72	40	48	132	248	91	60	95	79	110	264	317	195
20	140	177	115	54	59	24	21	33	43	131	140	129	150	409	363	87	76	43	109	333	366	206	72	48
21	54	39	38	69	66	96	126	51	75	154	169	89	67	349	239	41	33	39	55	152	82	152	76	73
22	164	51	65	59	31	32	43	39	28	43	69	95	84	45	44	61	153	92	45	76	93	67	48	36
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
24	132	77	41	44	36	35	95	133	216	301	465	317	228	136	69	151	206	104	92	49	137	312	157	107
25	59	36	44	41	74	60	42	33	33	26	30	31	27	34	57	27	28	73	48	26	30	45	23	24
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
27	21	26	65	33	33	43	20	44	156	146	78	93	126	116	203	123	212	230	150	104	230	163	73	107
28	93	62	34	23	24	26	28	31	32	48	55	49	41	43	36	39	43	45	84	195	47	48	52	260
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
30	200	58	24	49	128	223	424	180	182	63	191	106	111	85	53	151	327	99	329	280	117	258	86	156
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
MEAN	131	112	107	91	105	94	108	99	121	108	124	120	120	138	139	123	146	142	124	129	107	120	103	116
50 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
50 MEAN	256	227	226	219	294	278	273	249	315	260	291	277	298	295	263	313	351	322	273	342	243	222	217	248

VALUES ARE EXPRESSED IN GAMMAS

FEBRUARY 1970 AC 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	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
2	281	97	70	181	323	197	203	170	184	300	311	442	673	227	46	61	160	336	360	506	422	270	330	576	271
3	261	244	101	78	117	51	28	41	35	65	127	138	197	67	32	57	28	24	26	22	14	25	27	22	75
4	22	41	30	33	27	30	76	92	207	376	156	201	315	474	380	180	369	597	370	195	169	232	131	133	202
5	106	153	178	298	160	140	53	42	55	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
7	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
8	21	19	19	21	10	21	21	24	24	27	25	19	27	49	74	106	128	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	70	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
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
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	26	28	21	27	26	40	138	232	188	30	32	26	34	22	24	21	27	29	49
14	35	39	199	355	218	199	64	44	45	100	324	427	156	170	289	332	283	160	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	95	92
17	32	25	33	32	27	24	15	18	23	40	201	172	75	40	37	74	252	586	491	555	378	324	286	156	159
18	69	92	129	91	205	94	78	198	132	85	60	76	63	282	528	180	53	56	185	84	99	83	205	109	137
19	93	117	35	22	20	28	27	92	37	77	36	134	155	91	63	66	61	30	27	25	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
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
22	26	31	33	34	23	29	25	24	23	25	31	26	37	48	34	40	35	33	61	85	60	34	32	31	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
24	21	22	32	131	31	20	32	159	140	34	158	99	78	40	62	211	832	714	316	83	88	39	37	37	111
25	34	51	48	24	15	41	65	53	28	29	29	26	29	26	11	54	97	93	31	25	16	22	26	22	38
26	33	103	162	125	136	183	254	373	331	349	511	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	39	132	288	78	66	202	475	353	397	157
28	467	508	397	108	57	150	207	303	339	159	256	463	683	418	184	108	308	386	459	216	56	111	76	265	274
MEAN	72	73	70	70	74	78	69	95	94	89	115	134	134	142	142	123	145	169	136	180	81	86	95	106	184
SQ MEAN	25	23	25	24	19	24	25	34	46	37	27	24	30	38	38	50	60	57	43	54	47	37	31	28	35
SD MEAN	159	141	126	162	131	119	116	155	165	194	239	326	293	266	192	194	390	440	313	288	155	139	122	201	288

$$S_x = 5.58$$

$$S_y = 9.18$$

$$S_x = 6.38$$

MARCH		VALUES ARE EXPRESSED IN GANNAS																	MEAN						
		AE INDICES																							
UT	1970	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	350 207 158	270 144 220	368 504 538	547 420 418	297 400 882	662 170 122	91 95 122	176 147 237	321																
2	283 355 392	236 278 472	196 163 264	132 56 346	132 73 43	636 585 704	636 361 641	88 56 37	379 824 263	379 824 263	547 420 418	538 476 386	112 56 66	129 124 262	102 44 68	91 95 122	176 147 237	321							
3	125 71 69	48 55 74	132 56 346	132 73 43	636 585 704	636 361 641	88 56 37	379 824 263	379 824 263	547 420 418	538 476 386	112 56 66	129 124 262	102 44 68	91 95 122	176 147 237	321								
4	151 143 246	171 97 118	230 123 276	184 143 214	48 122 423	96 210 486	689 652 671	614 620 774	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482										
5	198 117 62	68 65 56	104 143 214	48 122 423	96 210 486	689 652 671	614 620 774	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482											
6	300 266 230	125 49 36	48 122 423	96 210 486	689 652 671	614 620 774	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482												
7	602 465 594	391 350 79	1023 119 120	689 652 671	614 620 774	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482													
8	469 429 557	1023 119 120	689 652 671	614 620 774	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482														
9	257 253 611	803 325 189	177 186 200	209 399 440	563 608 468	678 926 684	250 199 143	203 317 416	343 240 452	482															
10	277 88 119	37 38 30	51 104 222	131 145 142	59 31 34	40 124 158	295 287 325	100 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	175 255 239	295 475 363	198 72 45	37 49 45	40 36 31	33 44 80	133																
13	41 37 40	39 46 39	119 272 101	122 417 176	102 272 391	254 100 63	62 316 328	81 38 42	146																
14	52 68 130	51 49 43	33 35 65	46 42 40	36 33 24	26 38 31	26 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																
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	48 40 40	61 145 324	320 131 48	136 247 89	133 109 129	261 338 151	132																
19	86 58 62	49 37 35	49 148 119	70 58 53	107 147 57	42 54 61	96 59 114	317 183 91	88																
20	85 46 41	42 40 33	37 41 43	50 57 136	171 107 65	78 64 61	102 309 96	71 106 120	83																
21	139 165 175	183 76 49	54 44 45	57 53 50	58 55 73	206 203 153	77 54 58	29 33 38	89																
22	46 48 49	46 40 35	33 77 59	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																
24	50 51 46	30 44 47	47 48 31	59 57 58	50 68 46	43 46 40	24 22 33	46 50 55	46																
25	60 60 57	64 45 34	59 139 78	51 46 46	98 57 43	48 44 44	46 41 33	37 41 51	53																
26	50 51 106	119 164 142	50 71 89	54 79 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	584 847 782	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	946 348 386	549 437 460	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																
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	198 189 289	210																
50 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	60																
50 MEAN	335 302 407	520 433 352	275 376 489	432 634 545	406 467 950	928 644 594	636 475 398	378 400 468	495																

VALUES ARE EXPRESSED IN GANHAS

AE INDICES

APRIL 1970

UT	1	2	3	4	5	5	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	39	39	83	58	62
2	44	41	36	38	26	31	47	56	60	75	66	56	84	153	313	223	63	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	48	48	84	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	55	122
5	58	52	43	41	34	41	43	58	126	379	380	426	302	117	93	74	163	169	72	65	91	57	60	80	120
6	74	111	171	307	387	329	671	411	248	338	952	815	455	302	374	422	367	274	112	65	81	234	296	76	328
7	60	229	158	55	59	190	347	211	540	189	57	98	76	62	50	43	47	51	85	45	38	52	57	71	128
8	351	289	68	91	250	173	45	79	290	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	105	64	45	60	181	211	166	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	69	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	62	88	89	67	79	50	44	44	46	25	38	49	94	77	58
Q 15	63	54	48	49	46	36	37	46	73	112	101	72	65	76	83	123	308	524	611	328	386	192	185	238	160
16	373	316	203	286	348	338	240	218	139	74	69	57	51	47	46	49	46	47	59	295	824	910	789	658	270
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	559	693	793	800	442	146	280	125	163	103	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
Q 20	44	72	165	375	427	259	114	61	60	83	171	271	531	600	226	369	568	833	518	107	136	123	258	285	280
21	176	310	174	168	491	618	668	540	716	497	664	872	1090	828	858	768	1066	1027	693	433	491	786	595	565	638
22	862	826	692	784	617	737	489	292	348	523	300	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	363	462	445	662	349	718	496	574	576	277	294	205	103	133	386
25	566	410	288	323	407	309	445	398	467	566	374	503	399	308	212	292	121	45	134	398	366	273	361	299	344
26	394	384	222	224	79	73	61	47	57	62	81	99	263	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	73	69	71	84	195
Q 28	198	421	381	236	212	225	199	195	165	117	137	147	284	173	98	75	52	56	68	54	73	133	94	77	154
29	75	113	153	162	186	200	157	86	195	290	193	284	363	441	267	153	327	432	592	320	195	230	340	188	246
30	128	196	595	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	216	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	482	423	407	468	539	384	195	266	305	303	222	389

VALUES ARE EXPRESSED IN GAMMAS

AE INDICES

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
1	193	107	78	92	106	256	365	253	101	49	65	76	152	429	258	154	117	73	160	331	362	513	319	277	293
2	343	121	77	156	309	96	149	215	261	127	96	77	92	73	54	61	152	159	320	235	89	118	177	248	160
3	111	75	56	46	40	35	31	55	56	64	106	237	339	286	276	153	154	247	322	130	233	268	595	333	177
4	188	91	68	58	58	44	59	91	165	227	221	137	139	105	129	177	296	334	136	81	180	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	116	132	361	202
6	188	78	59	53	47	46	42	58	74	131	140	142	191	167	130	85	222	180	122	105	60	59	66	60	134
7	61	56	49	79	50	50	49	52	59	77	157	166	150	159	71	51	59	119	126	180	117	71	65	59	89
Q	66	96	55	47	54	47	47	50	67	89	73	73	65	71	58	53	168	310	234	231	191	157	195	205	111
Q	134	138	117	98	190	171	144	152	182	64	86	199	90	105	93	115	152	106	91	129	08	63	58	59	111
Q	62	56	51	55	113	88	72	67	155	130	115	80	78	59	63	59	56	36	38	46	46	50	55	56	73
Q	55	46	37	41	47	53	62	73	64	77	80	93	91	71	64	59	43	46	52	74	83	135	166	337	61
Q	198	213	145	265	224	78	52	229	121	208	421	475	483	482	423	308	568	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	156	415	746	754	812	795	389	321	398	325
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	165
16	138	110	116	118	127	267	233	135	313	113	71	83	193	139	265	233	289	388	224	201	248	173	139	265	187
17	351	213	119	74	409	576	363	97	50	64	125	286	301	408	232	84	97	101	62	79	50	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	58	86
19	67	74	82	100	167	127	343	332	350	464	493	348	231	166	81	74	95	195	187	163	167	275	229	132	207
Q	230	249	178	246	495	559	267	129	148	346	414	344	358	467	343	478	472	446	332	249	479	346	273	407	346
21	614	327	299	337	270	200	168	158	194	347	392	337	251	296	305	310	160	150	261	254	233	92	117	221	256
22	267	359	310	195	107	131	233	265	100	94	130	243	269	225	351	387	315	541	541	297	238	177	123	97	248
23	83	68	89	87	66	49	33	124	308	210	230	251	141	81	83	102	91	217	385	254	258	261	511	466	183
24	394	294	139	118	76	59	41	81	121	165	233	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	258	391	363	406	209	252	253	202	132	166	193	275	156	265
Q	57	70	60	48	39	33	30	45	53	71	73	69	59	58	80	146	125	100	137	121	98	125	160	87	61
Q	133	94	37	120	115	173	361	286	380	326	145	195	390	526	305	288	576	792	782	570	802	815	729	687	400
Q	446	653	319	126	95	74	62	57	149	446	786	853	9681	3661	1081	737	656	281	200	259	214	171	145	300	445
Q	375	297	144	106	359	403	919	643	451	246	222	159	238	166	79	92	128	134	68	262	335	190	106	166	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	266	189	136	143	175	168	167	155	175	212	243	275	223	244	210	167	222	257	225	203	213	203	201	217	200
50 MEAN	77	61	64	66	99	78	71	81	88	86	85	85	77	73	72	86	109	128	110	120	101	106	119	149	51
50 MEAN	276	341	175	173	256	257	252	291	250	315	398	405	407	695	446	397	440	455	362	373	484	465	348	370	357

VALUES ARE EXPRESSED IN GAMMAS

AE INDICES

JUNE

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

JUNE		1970		RE		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	
D	1	94	132	201	733	524	234	174	164	237	597	268	343	392	598	706	722	590	660	418	320	232	331	345	211	393	
	2	222	127	237	295	244	161	77	76	64	62	118	104	138	135	151	217	305	236	242	246	273	202	177	297	183	
	3	147	171	208	312	545	507	344	244	469	501	473	414	451	233	359	336	259	168	285	391	253	274	223	398	355	
	4	327	369	386	156	267	169	177	257	373	376	345	219	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	156	
Q	6	40	44	52	64	90	81	59	131	111	156	208	97	63	65	52	57	44	39	33	52	44	45	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	43	276	236	305	103	53	46	69	103	186	215	144	162	250	171	242	
	9	112	79	130	162	73	45	51	68	126	92	56	48	53	53	78	84	90	104	194	376	338	321	301	160	134	
	10	146	111	134	113	79	73	69	200	262	160	236	126	54	134	173	162	234	466	404	363	340	195	61	91	153	
Q	11	161	189	250	147	56	56	63	69	64	67	65	71	62	53	55	112	124	306	261	186	116	59	57	75	114	
	12	125	165	150	164	156	96	77	82	124	174	185	208	152	203	123	65	78	119	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	230	160	
	15	497	438	369	198	113	271	308	401	496	517	610	647	421	411	251	271	269	347	279	227	255	465	315	352	363	
Q	16	380	291	283	238	308	409	186	47	49	53	63	65	168	128	177	116	126	79	74	137	228	149	199	296	175	
	17	98	52	54	57	54	34	51	74	81	99	116	145	357	379	234	93	206	457	522	711	691	580	634	587	254	
	18	504	307	128	86	68	97	65	370	628	219	918	853	112	882	873	738	628	425	345	507	686	685	657	544	528	
D	19	463	417	391	174	74	74	211	96	111	253	235	126	85	108	117	112	103	147	235	258	280	495	945	643	236	
	20	706	699	572	554	639	625	503	682	649	660	636	787	591	612	666	907	917	773	579	669	861	745	616	600	673	
D	21	625	499	600	581	510	552	685	684	632	442	482	680	346	468	395	468	407	385	240	50	46	134	95	86	413	
	22	134	153	107	92	61	59	53	53	48	64	114	175	133	95	76	93	63	51	81	208	249	213	174	131	112	
Q	23	170	182	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	67	49	55	50	83	135	185	77	65	129	229	444	214	259	355	127	
	25	376	412	121	62	57	50	166	142	212	317	358	407	369	378	246	216	136	112	132	108	96	181	312	245	218	
D	26	74	69	86	199	444	481	500	616	577	422	273	131	124	86	135	524	777	574	609	784	572	307	202	131	365	
	27	153	130	248	614	584	318	309	439	324	924	500	344	895	672	341	149	156	290	150	65	106	150	127	70	363	
Q	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	400	574	543	447	273	168	206	
	30	93	77	58	51	53	55	71	381	461	503	458	276	109	60	43	44	55	61	63	56	52	55	53	91	191	
MEAN		233	221	221	220	211	206	200	225	265	284	286	266	277	261	236	226	226	246	236	270	270	254	245	255	244	
50 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	195	
50 MEAN		416	353	368	914	465	365	351	452	612	668	565	569	667	646	614	585	544	507	339	322	368	393	372	302	474	

VALUES ARE EXPRESSED IN GAMMAS

AE INDICES

1970

JULY

UT

MEAN

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	69	204	262	235	364	246	392	396	372	267	140	122	184	296	550	174	123	120	112	114	121	65	61	89	212
2	73	68	66	54	105	199	433	474	422	205	378	701	171	67	47	60	111	83	59	48	53	73	52	121	172
3	289	212	261	172	397	688	644	646	606	616	711	398	279	230	119	84	67	49	57	49	163	312	509	964	355
4	943	592	294	126	343	655	644	398	624	310	227	129	137	130	74	81	80	58	52	55	57	54	63	66	750
5	96	91	126	256	646	685	507	359	387	127	85	78	50	111	171	166	285	503	177	60	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
7	61	65	61	50	36	35	38	77	176	206	150	57	79	55	63	43	49	61	53	127	290	263	292	507	121
8	302	208	336	545	608	602	616	363	179	90	65	69	234	430	287	268	356	544	534	457	468	451	506	615	369
9	814	440	159	670	738	636	474	260	392	652	799	814	967	1299	1150	910	470	317	407	465	756	776	619	693	652
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	282	182	55	83	211	297	292	275	266	265	281	256	221	266	330	311	219	267	340	388	262	422	253
12	513	454	461	501	292	187	192	227	273	393	194	174	309	299	334	428	314	100	336	375	153	178	372	387	386
13	303	260	393	440	190	359	207	85	36	35	111	120	116	110	112	171	297	595	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	111	455	415	169	121	145	356	177
15	280	97	105	114	180	41	39	69	137	377	368	259	128	127	37	81	90	102	96	74	57	63	111	151	131
16	271	383	356	194	118	152	59	45	45	49	50	154	368	308	102	38	137	243	376	235	118	53	45	47	164
17	48	82	145	87	26	26	35	92	45	51	55	67	106	152	263	216	366	532	260	182	218	439	618	318	162
18	114	90	125	146	194	168	55	35	37	81	129	115	99	80	65	78	44	51	64	169	194	183	187	81	187
19	71	69	87	212	275	155	112	71	70	133	310	230	58	43	50	97	194	386	185	78	116	291	291	425	167
20	302	180	139	141	61	143	177	126	69	88	70	64	62	74	60	52	62	76	144	239	333	241	383	680	167
21	741	446	239	330	285	102	79	63	217	200	337	519	384	606	853	327	233	205	656	603	317	330	570	603	366
22	488	222	81	160	195	289	225	243	469	473	290	124	118	93	113	164	379	505	203	165	410	478	527	543	291
23	505	328	235	142	96	136	242	251	245	164	149	164	237	94	298	777	94	298	483	267	126	61	64	74	191
24	165	443	646	743	574	488	598	308	69	56	59	129	324	126	507	590	309	355	458	307	99	153	395	485	361
25	1090	604	768	1045	421	733	705	710	876	916	826	1131	453	645	349	116	118	116	85	60	202	742	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	140	336	460	311	53	64	377	348	262	198	361	359	580	448	411	284	444	346	122	163	342	288
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
29	300	195	124	294	784	813	864	660	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	90	174	174	126	142	155	76	68	177	246	136	205	474	323	162
31	388	506	233	432	455	423	242	344	951	415	380	424	361	313	250	406	549	818	774	308	196	388	692	456	429
MEAN	357	261	250	279	288	307	306	257	297	285	263	284	258	263	244	230	221	265	268	229	217	254	319	340	275
50 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
50 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

VALUES ARE EXPRESSED IN GAWHAS

RE INDICES

AUGUST 1979

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
0	319	242	242	140	93	71	91	98	131	110	146	95	53	43	61	46	183	95	63	51	74	103	82	125	108
1	121	156	303	361	332	198	35	54	192	272	113	61	92	80	79	60	57	49	48	43	68	57	92	63	124
2	72	67	87	61	72	59	67	39	48	64	98	88	92	72	89	131	61	61	39	46	46	46	42	56	81
3	64	39	92	71	70	63	46	61	109	178	114	103	41	77	114	179	184	88	81	169	111	117	91	76	95
4	77	95	111	149	185	131	67	60	30	36	54	57	53	61	59	60	44	47	38	61	60	68	62	58	69
5	51	66	61	35	65	50	49	62	100	270	183	63	95	63	61	86	84	76	61	91	145	306	312	497	117
6	313	213	88	61	47	67	70	132	106	79	75	69	78	76	129	192	263	65	110	186	167	612	702	922	172
7	276	176	408	314	97	95	270	334	735	770	705	688	305	105	128	189	100	176	601	466	166	252	375	586	336
8	669	813	463	275	332	257	240	256	179	97	398	574	308	201	74	70	60	359	482	176	109	92	66	97	276
9	58	143	165	174	67	86	184	156	317	283	183	486	348	160	59	77	136	103	92	97	71	117	162	139	157
10	162	107	133	171	260	114	103	126	269	411	195	166	98	264	292	199	69	70	69	199	171	98	266	628	134
11	641	829	496	623	949	210	65	109	299	296	62	86	80	78	56	37	48	60	150	281	973	409	196	08	243
12	73	74	118	73	61	238	216	113	162	218	268	142	131	263	179	102	129	173	316	892	489	918	919	174	214
13	92	105	157	276	206	91	66	69	60	71	60	69	91	66	62	79	128	102	95	79	88	130	136	166	100
14	171	161	189	177	120	192	165	74	180	200	199	222	183	87	52	59	102	67	85	162	97	101	216	411	149
15	302	229	108	108	103	223	187	238	227	297	242	172	358	334	149	103	123	231	935	192	118	120	798	981	269
16	860	493	596	815	887	811	1068	912	945	676	741	594	898	923	695	968	826	973	1056	834	252	226	393	408	710
17	324	672	461	930	176	200	346	522	607	483	656	787	985	808	743	952	988	113	776	294	287	232	392	617	982
18	653	952	342	236	242	296	214	60	182	406	588	169	239	277	322	311	376	236	129	67	84	53	50	56	268
19	48	47	44	60	69	49	56	193	247	234	133	236	226	129	74	61	66	54	51	81	72	111	109	101	183
20	189	141	238	191	138	107	106	121	97	96	176	177	126	66	64	98	198	134	120	54	50	88	101	74	116
21	92	40	64	76	126	130	117	106	121	106	167	293	626	333	297	268	411	343	331	232	108	57	86	138	187
22	181	823	129	233	293	214	326	383	467	439	269	191	302	174	81	87	110	298	143	12	63	96	97	48	194
23	57	64	64	153	59	45	37	37	62	99	61	77	107	151	118	90	110	111	173	128	111	170	159	110	95
24	119	110	143	195	229	302	441	986	463	359	330	376	465	678	674	379	352	306	143	264	339	296	399	299	319
25	308	215	86	197	679	615	481	621	610	758	664	682	434	674	589	699	937	315	317	149	232	390	707	261	498
26	374	338	314	181	328	964	489	133	86	159	93	95	137	199	602	658	967	359	668	216	309	423	619	132	324
27	64	91	46	43	68	216	192	170	92	58	68	66	46	44	299	561	913	393	471	486	377	397	767	353	220
28	134	66	188	658	619	396	271	368	388	271	111	168	298	191	165	359	187	60	72	77	99	96	67	97	236
29	184	312	272	220	168	115	161	196	223	111	108	100	103	89	84	112	77	79	95	170	124	99	91	91	136
30	39	60	42	92	80	297	628	367	500	377	279	146	164	364	348	318	436	676	693	956	402	112	129	74	267
31	222	203	200	219	223	265	210	213	296	262	239	231	243	229	209	317	237	239	261	203	170	183	224	234	221
MEAN	134	95	105	115	66	76	98	95	72	87	87	64	69	61	84	102	66	69	79	83	108	181	87	83	86
90 MEAN	468	474	460	428	474	408	481	907	993	557	633	641	633	562	637	612	492	596	607	391	192	281	267	374	476

VALUES ARE EXPRESSED IN GAMMAS

SEPTEMBER 1970 AF 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
D	1	63	46	39	36	46	38	164	538	654	568	912	465	146	153	227	540	464	535	796	677	534	390	228	158	349
	2	271	247	123	70	50	120	117	78	64	243	575	448	292	277	227	199	273	515	372	162	226	236	136	92	225
	3	62	55	81	413	413	91	63	176	387	561	463	532	581	166	130	332	298	150	117	167	163	346	537	315	272
	4	185	169	125	77	55	95	164	148	168	79	87	194	342	66	75	177	381	115	165	173	238	226	67	121	153
	5	208	93	93	134	165	116	51	59	65	70	79	65	92	129	118	356	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	218	74	111
	7	69	104	88	41	32	26	26	62	67	62	95	86	142	123	110	65	56	40	49	125	252	348	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	56	151	116	93	80	93	71	65	95	69	81	83	93	165	95	78	177	497	467	476	363	150
	10	432	377	241	292	283	195	67	62	64	47	51	53	64	76	63	46	45	33	28	30	31	32	32	32	112
Q	11	36	40	35	28	25	24	26	31	45	52	57	53	95	48	42	53	52	56	44	41	37	37	30	31	41
	12	31	44	57	58	299	309	234	326	273	83	50	44	46	39	41	42	57	91	61	36	40	49	41	38	98
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
Q	14	199	362	384	189	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	528	482	250	313	88	55	48	129	217	312	173	54	68	58	140	247	225	97	207	179	64	214
	16	91	124	297	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	101
	18	130	253	229	422	287	183	234	399	378	229	142	54	46	90	129	296	73	167	264	121	98	216	260	89	191
	19	51	57	123	234	364	646	398	283	458	542	562	279	287	384	386	278	580	599	594	715	502	336	420	160	382
	20	172	164	80	54	137	446	346	230	347	465	302	282	408	386	474	425	453	315	172	219	247	160	211	558	294
D	21	505	435	391	350	333	432	481	573	655	210	76	244	793	886	706	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	232	544	392	97	91	70	208	180	216
	23	241	224	87	59	40	45	208	322	399	494	522	280	277	230	141	100	171	211	75	77	65	80	73	63	187
	24	248	188	127	250	208	265	334	349	422	310	68	37	46	74	79	57	54	87	171	404	86	89	113	82	173
	25	66	62	56	134	429	412	351	222	336	300	75	37	44	55	89	132	125	161	321	94	53	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
Q	27	402	448	323	380	429	424	375	482	235	119	299	372	271	186	450	495	691	392	525	386	88	156	492	633	375
	28	435	194	108	97	66	71	39	29	28	43	66	81	77	77	77	59	47	38	49	40	47	49	48	58	80
Q	29	59	58	53	50	47	66	90	113	83	60	42	64	56	48	52	51	49	34	33	33	35	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	168	154	171	210	215	211	209	245	219	221	211	213	197	196	215	241	234	232	208	192	189	190	168	202
5Q MEAN		53	90	93	58	121	114	98	116	118	64	54	55	58	56	66	97	107	94	100	49	144	142	171	118	92
5D MEAN		241	265	239	200	222	293	332	466	505	383	474	554	482	522	516	484	466	489	429	424	420	349	266	344	388

VALUES ARE EXPRESSED IN GAMMAS

OCTOBER 1979 AE 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	195	251	108	65	121	246	131	71	47	45	85	53	50	54	112	172	105	108	351	542	348	202	172	420	189
2	588	299	144	116	178	83	95	92	91	120	183	76	112	102	110	82	78	156	248	252	157	125	185	121	192
3	231	182	156	226	135	95	97	112	95	93	77	85	83	82	133	370	466	258	331	415	262	398	288	425	211
4	347	262	216	503	629	229	360	401	343	259	494	503	277	437	162	64	163	378	381	203	282	118	178	130	303
5	97	130	258	168	84	146	322	237	90	137	81	58	111	59	68	62	123	73	66	242	250	147	81	45	133
6	53	146	108	99	122	107	109	94	58	65	154	233	74	85	56	46	38	34	69	203	184	232	175	44	109
7	26	24	23	40	26	26	50	102	73	53	53	46	83	141	49	42	39	33	33	32	37	45	51	50	69
8	42	34	34	88	59	42	29	28	37	48	46	46	38	41	39	38	41	42	50	30	38	43	16	56	43
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	28	27	33	30	101	117	198	346	163	70	50	51	43	41	63	74	151	318	562	573	506	409	361	430	198
11	462	418	338	301	346	582	457	686	567	684	470	303	424	389	459	525	412	403	407	521	135	73	227	314	484
12	428	408	345	465	632	422	265	431	302	386	362	258	217	168	59	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	365	273	228	240	132	137	81	55	184
14	179	281	207	208	183	60	84	105	225	175	169	243	199	136	56	49	53	123	156	146	177	146	122	73	151
15	224	134	166	86	109	115	105	79	58	89	85	50	55	112	205	90	44	45	35	36	71	125	35	30	88
16	32	31	29	38	61	67	36	31	35	155	298	946	761	552	427	604	726	1011	542	490	189	192	275	395	338
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
18	436	487	451	418	121	109	126	369	515	345	174	217	283	142	165	374	411	244	222	232	140	258	337	146	280
19	193	165	212	196	296	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	187	43	37	35	95	82	39	203
21	35	43	32	37	35	30	27	29	27	38	31	39	39	43	44	47	63	60	77	48	41	51	87	76	46
22	180	268	276	273	246	292	231	174	420	326	323	460	418	516	634	681	789	783	517	429	382	384	257	385	309
23	321	325	241	153	320	391	431	271	246	247	326	283	204	268	821	459	707	391	775	602	497	357	265	255	398
24	340	62	74	183	202	371	192	190	544	240	229	462	353	323	276	164	81	79	187	202	215	67	42	71	215
25	54	55	116	103	36	37	167	278	169	120	165	141	221	360	238	136	384	215	76	183	86	72	36	38	138
26	31	50	163	130	66	44	48	59	84	74	200	331	292	164	139	71	68	183	84	68	43	31	52	42	99
27	40	39	34	46	57	50	76	64	59	44	48	38	69	82	64	53	48	34	27	29	77	291	180	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	166	129	191
29	131	66	36	32	58	141	207	156	57	104	72	108	114	221	136	75	182	485	525	683	518	332	457	391	216
30	206	173	215	301	185	47	35	73	46	88	78	181	60	42	43	143	252	66	38	36	38	50	45	40	187
31	53	40	34	27	60	46	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	182	191	182	180	212	213	209	201	226	236	224	244	261	199	174	166	160	194
50 MEAN	76	56	46	56	54	48	41	55	49	58	56	49	57	79	77	52	45	49	62	61	44	60	58	48	55
50 MEAN	285	267	296	258	266	212	301	342	335	326	349	507	437	463	464	571	594	514	536	447	297	265	330	268	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	60	59	35	26	31	36	33	30	39
2	45	39	54	50	50	40	34	45	226	230	80	110	307	251	131	184	71	39	35	22	23	29	32	76	88
3	140	165	145	104	108	77	99	97	180	156	69	25	43	42	127	385	343	467	417	427	277	358	216	132	109
4	216	216	140	107	67	47	37	64	216	108	173	216	87	46	44	85	140	139	79	144	167	203	187	101	133
5	97	201	154	68	109	123	205	147	296	160	80	110	105	64	69	199	163	67	105	245	371	426	280	234	167
6	192	231	224	286	337	427	347	337	606	539	507	510	614	643	390	375	223	116	58	63	121	233	188	139	322
7	199	765	599	666	705	712	646	923	624	786	860	1476	959	839	1079	361	268	272	311	470	532	320	225	560	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	228	221	317	292	271	275	249	173	67	89	442	396	489	304	168	234	127	37	33	195
10	92	193	281	130	219	289	101	66	56	286	565	584	407	272	376	759	442	271	273	126	178	163	61	169	265
11	307	486	296	316	159	183	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	148	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	370	298	186	243	299	236
14	329	298	85	39	55	126	90	163	131	96	54	68	52	54	160	148	376	352	317	221	97	99	28	20	184
15	24	19	16	14	15	17	16	20	30	64	77	215	119	55	36	38	35	32	57	143	231	96	38	33	60
16	27	36	31	42	38	34	27	23	34	47	195	154	117	58	54	76	224	358	175	66	99	167	93	126	36
17	137	163	108	205	165	45	43	46	52	55	115	199	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	364	178
19	277	316	396	529	422	451	400	179	146	47	71	54	40	33	44	33	28	31	23	19	20	21	26	23	151
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
21	47	87	216	361	177	53	175	119	615	1021	117	1121	848	931	1057	759	365	316	249	269	250	249	290	107	462
22	399	313	355	446	179	98	67	109	263	227	424	358	355	535	577	591	748	589	617	493	482	366	347	345	387
23	280	331	314	430	262	316	384	453	598	698	573	497	362	386	1872	1844	785	607	314	342	230	230	414	250	464
24	105	116	131	128	98	114	50	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	305	329	147	60	165	472	123	98	41	122
27	38	47	103	72	82	84	78	101	112	387	259	263	374	594	169	59	62	237	264	81	182	212	227	169	177
28	83	55	59	99	152	313	150	51	49	47	90	97	162	102	273	426	185	36	42	78	52	89	34	41	112
29	27	23	26	48	42	33	29	32	42	38	44	88	58	34	30	29	60	68	44	57	28	22	18	20	39
30	20	17	11	26	33	37	24	30	36	42	41	45	33	30	31	25	57	55	42	42	38	32	28	40	34
MEAN	139	162	195	173	141	150	141	140	195	233	243	266	226	239	272	261	260	226	188	164	167	157	134	129	191
50 MEAN	23	21	22	27	28	26	25	24	30	40	46	102	62	37	31	31	48	47	39	56	69	39	34	37	39
50 MEAN	246	396	358	448	296	272	335	342	522	645	696	733	461	601	805	629	543	394	311	331	351	295	276	274	441

VALUES ARE EXPRESSED IN GAMMAS

AE INDICES

DECEMBER 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	
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	282	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	147	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	146	131	340	268	335	163	90	414	582	415	510	375	255	251	187	92	49	34	209
	7	59	43	46	52	103	67	170	125	75	74	135	176	479	339	291	223	171	191	152	229	316	362	335	311	191
	8	384	438	453	568	414	239	202	434	336	239	536	417	478	691	509	76	58	183	335	388	284	124	163	99	329
Q	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	35
	12	21	28	81	46	40	37	42	44	47	163	136	178	274	225	160	86	43	40	100	57	68	83	192	142	97
	13	109	73	53	60	42	29	29	33	60	43	33	27	28	27	20	18	44	101	180	43	20	49	171	281	69
Q	14	138	226	335	237	405	924	821	952	949	451	428	315	373	182	165	146	68	133	648	923	362	394	527	287	416
D	15	120	209	431	179	131	235	339	455	426	403	343	318	149	486	259	397	320	208	237	103	67	77	79	117	255
	16	97	105	91	72	59	52	92	73	40	41	31	71	62	51	54	56	70	101	86	92	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	92	27	31	40	69	44	33	42	59	35	29	37	38	32	37	47
	19	66	38	52	74	35	38	117	136	331	451	136	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	75	187	199	115	110	76	186
	21	131	141	100	62	76	97	148	198	168	160	126	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	165	161	62	77	70	103	137	179	65	130
	23	52	74	137	176	117	96	77	39	43	34	87	234	182	183	158	161	103	51	47	25	21	35	40	141	98
	24	363	426	401	363	193	137	114	73	110	199	59	47	68	132	234	188	52	33	39	128	158	94	61	71	156
D	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	169	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	185	234	273	496	458	366	179
	28	387	330	202	276	131	137	187	103	81	261	190	103	540	425	238	337	650	542	494	545	452	393	318	369	324
D	29	226	62	82	118	146	203	161	137	172	126	48	30	70	114	123	147	213	280	380	169	99	111	218	449	159
	30	371	263	371	476	331	102	49	45	39	46	27	27	24	32	46	78	521	343	68	26	48	58	20	27	143
Q	31	29	27	20	50	21	15	15	32	17	20	26	27	33	30	24	27	27	31	24	21	24	25	26	32	25
MEAN		110	122	126	123	102	117	128	142	174	164	138	121	138	167	142	132	148	123	134	132	123	128	141	131	134
50 MEAN		49	36	26	35	31	28	36	33	59	65	65	76	83	67	69	56	56	43	52	58	42	37	27	26	50
50 MEAN		280	343	364	325	255	374	333	403	380	311	311	256	322	367	282	229	238	202	351	338	257	216	230	183	296

VALUES ARE EXPRESSED IN GAMMAS

JANUARY 1970 AL 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
0	-6	-3	-3	-3	-4	104	-44	-35	-21	-7	-3	-14	-124	-132	-126	-82	-311	-352	-99	-9	-9	-26	-56	-108	-72
1	-54	-42	-87	-263	-286	-219	-180	-368	-431	-262	-220	-394	-576	-415	-322	-425	-150	-243	-186	-581	-311	-168	-299	-292	-282
2	-230	-100	-119	-85	-38	-8	-89	-158	-233	-191	-130	-71	-110	-210	-102	-18	-36	-93	-28	-22	-41	-135	-62	-16	-94
3	-14	-15	-10	-12	-10	-14	-40	-15	-25	-56	-80	-35	-33	-26	-96	-137	-127	-20	0	-1	-16	-34	-83	-15	-39
4	-9	-7	-12	-11	-13	-10	-6	-3	-13	-44	-130	-77	-48	-68	-95	-57	-34	-6	0	-1	-16	-34	-83	-15	-39
5	-92	-11	-3	-3	-16	-13	-8	-9	-12	-16	-25	-83	-182	-170	-74	-11	-11	-46	-132	-104	-31	-11	-6	-8	-47
6	-4	-4	-10	-11	-8	-11	-14	-16	-25	-20	-8	-9	-33	-28	-29	-69	-202	-311	-363	-200	-52	-47	-8	-27	-63
7	-64	-76	-30	-25	-23	-11	-5	-11	-15	-21	-13	-51	-14	-37	-13	-29	-75	-445	-65	-5	1	4	-16	-45	-35
8	-202	-149	-25	-17	-46	-65	-8	-73	-150	-67	-15	-16	-25	-21	-104	-85	-151	-807	-115	-32	-24	-41	-91	-94	-77
9	-105	-18	-132	-1	0	-3	-3	0	-8	-8	-12	-99	-48	-89	-28	-14	-16	-55	-70	-22	-12	-6	-4	-6	-32
10	-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
11	-288	-101	-32	-55	-28	-8	-14	-78	-83	-45	-46	-40	-15	-17	-51	-38	-61	-206	-147	-58	-93	-395	-63	-8	-78
12	-4	-6	0	-6	-11	-12	-10	0	-3	-6	-12	-10	-25	-19	-203	-50	-167	-78	-17	-11	-11	-11	-22	-9	-37
13	-5	-7	-19	-72	-43	-64	0	-19	-15	-10	-10	-19	-24	-116	-88	-39	-20	-10	-7	-7	-6	-9	-17	-133	-35
14	-70	-25	-4	-3	-47	14	5	0	-6	-1	-4	-6	0	-6	-6	-19	-34	-120	-43	-14	-10	-13	-26	-39	-20
15	-34	-12	-178	-86	-67	-112	-125	-211	-315	-263	-538	-443	-370	-431	-477	-399	-503	-537	-361	-478	-481	-391	-333	-421	-323
16	-421	-486	-345	-219	-380	-210	-115	-64	-88	-67	-62	-37	-48	-26	-28	-84	-84	-69	-55	-83	-61	-29	-11	-22	-124
17	-18	-15	-62	-22	-69	-52	-136	-85	-29	-16	-44	-45	-17	-17	-17	-46	-108	-27	-27	-19	-11	-8	-26	-16	-46
18	-13	-15	-7	-3	-1	-2	-5	-7	-19	-35	-46	-24	-18	-22	-97	-241	-81	-52	-80	-83	-84	-285	-244	-81	-68
19	-80	-112	-66	-21	-44	-9	-6	-6	-11	-79	-93	-80	-97	-303	-273	-19	-46	-22	-91	-252	-298	-134	-12	-15	-93
20	-11	-7	-7	-14	-44	-56	-91	-24	-43	-110	-119	-52	-31	-380	-175	-18	-16	-18	-39	-132	-63	-123	-50	-41	-64
21	-161	-17	-28	-28	-6	-3	-14	-18	-0	-11	-29	-57	-47	-10	-25	-44	-152	-82	-35	-80	-72	-64	-20	-11	-41
22	-12	-2	-160	-134	-78	-62	-69	-89	-32	-10	-12	-38	-54	-42	-37	-24	-20	-32	-30	-31	-36	-23	-130	-103	-14
23	-114	-46	-22	-20	-18	-17	-41	-107	-142	-226	-361	-186	-145	-116	-46	-131	-152	-88	-72	-22	-94	-262	-84	-47	-108
24	-19	-8	-12	-17	-44	-43	0	-5	-6	-8	-10	-14	-12	-13	-36	-16	-16	-65	-39	-11	-16	-34	-12	-11	-19
25	-18	-22	-41	-53	0	1	-3	-7	-67	-10	-13	-15	-15	-15	-26	-34	-37	-39	-18	-9	-13	-9	-10	-11	-20
26	-9	-6	-39	-21	1	0	0	-1	-114	-71	-23	-32	-58	-59	-137	-7	-150	-203	-110	-99	-92	-67	-28	-62	-61
27	-36	-7	-5	0	0	0	-1	-2	-3	-8	-16	-4	-8	-16	-4	-8	-10	-12	-36	-125	-58	-21	-23	-216	-25
28	-105	-45	-21	-23	-20	-50	-146	-159	-114	-26	0	-4	-10	-14	-11	-11	-9	-10	-9	1	0	0	0	-47	-95
29	-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
30	-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
31	-82	-62	-58	-45	-52	-42	-47	-54	-67	-55	-74	-67	-75	-92	-93	-63	-104	-102	-86	-39	-69	-80	-60	-74	-71
MEAN	-11	-13	-15	-18	-13	-14	-11	-6	-21	-18	-25	-20	-31	-33	-96	-90	-73	-17	-22	-18	-26	-40	-38	-31	-38
50 MEAN	-171	-149	-131	-125	-171	-149	-140	-160	-202	-136	-192	-140	-218	-187	-190	-217	-291	-324	-186	-262	-188	-155	-153	-105	-100

VALUES ARE EXPRESSED IN GAMMAS

AL INDICES

FEBRUARY 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

1	-14	-10	-12	-24	-15	-11	-32	-7	-1	-4	-2	-5	-7	-13	-13	-19	-32	-33	-24	-14	-8	-35	-176	-293	-64
2	-12	-27	-10	-19	-18	-94	-78	-63	-96	-230	-230	-380	-387	-152	-11	-21	-109	-254	-257	-371	-339	-163	-216	-406	-161
3	-15	-151	-21	-42	-51	-18	-7	-11	-13	-22	-25	-96	-166	-17	-15	-23	-18	-16	-14	-13	-5	-7	-5	-6	-43
4	-0	-10	-11	-8	-7	-7	-39	-33	-121	-269	-54	-124	-221	-383	-267	-69	-276	-467	-269	-130	-91	-168	-13	-53	-131
5	-41	-103	-125	-134	-71	-61	0	-3	-26	-26	-34	-42	-169	-320	-234	-69	-87	-129	-56	-29	-54	-83	-254	-204	-38
6	-59	-13	-9	-16	-23	-12	0	-79	-43	-13	-6	-7	-10	-10	-10	-12	-15	-34	-62	-41	-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
8	-8	-7	-9	-10	-2	-1	-4	-4	-4	-6	-6	-7	-12	-28	-55	-81	-104	-98	-58	-86	-55	-34	-16	-7	-29
9	-5	-7	-27	-37	-7	-6	-36	-16	-7	-7	-8	-15	-17	-18	-61	-124	-85	-84	-49	-9	-5	-6	-5	-4	-27
10	-3	-3	-4	-4	-4	-4	-11	-44	-26	-5	-5	-5	-14	-35	-76	-348	-391	-335	-209	-22	-20	-15	-17	-12	-68
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	-2	-4	-6	-6	-6	-9	-11	-23	-19	-26	-26	-22	-20	-11	-10	-16	-18	-16	-12
13	-10	-11	-9	-3	-7	-46	1	0	1	-5	-9	-19	-98	-180	-122	-5	-4	-8	-10	-3	-7	-5	-8	-10	-24
14	-13	-12	-84	-323	-152	-111	-27	-30	-38	-67	-255	-301	-117	-120	-209	-284	-210	-109	-17	-11	-9	-12	-9	-12	-108
15	-10	-15	-94	-93	-124	-190	-209	-112	-74	-59	-253	-92	-5	-23	-47	-120	-71	-145	-227	-181	-29	-2	-10	-14	-92
16	-8	-5	-13	-7	-2	-10	-22	-121	-143	-64	-46	-137	-180	-442	-188	-78	-14	-13	-5	-18	-23	-35	-60	-48	-56
17	-6	-7	-15	-6	-3	-1	0	-1	-1	-7	-140	-130	-42	-24	-20	-43	-210	-309	-337	-369	-248	-248	-238	-92	-107
18	-30	-59	-82	-52	-142	-62	-37	-147	-49	-27	-8	-33	-21	-212	-460	-108	-21	-35	-152	-49	-69	-51	-173	-119	-91
19	-71	-91	-15	-9	-5	-4	-9	-19	-11	-6	-19	-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	-20	-162	-137	-39	-29	-19	-72	-34	-17	-15	-14	-29
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
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
24	-4	-4	-17	-12	-12	-1	-17	-127	-102	-14	-136	-84	-18	-10	-17	-158	-79	-96	-153	-14	-12	-14	-16	-19	-89
25	-14	-23	-20	-6	-2	-21	-42	-34	-9	-12	-15	-14	-13	-14	-16	-36	-61	-70	-9	-4	-1	-7	-13	-13	-21
26	-21	-91	-138	-99	-96	-99	-165	-222	-235	-13	-244	-253	-127	-23	-309	-167	-39	-91	-30	-23	-20	-27	-25	-28	-146
27	-24	-23	-21	-21	-26	-87	-80	-114	-187	-126	-145	-148	-94	-231	-110	-56	-96	-17	-63	-30	-17	-169	-14	-248	-112
28	-40	-449	-290	-42	-7	-62	-148	-187	-136	-87	-151	-266	-223	-243	-108	-120	-281	-246	-206	-133	-1	-41	-25	-157	-168
MEAN	-46	-45	-42	-44	-39	-38	-37	-33	-31	-49	-69	-83	-90	-98	-95	-81	-103	-123	-86	-65	-46	-52	-59	-67	-65
50 MEAN	-9	-10	-13	-10	-4	-5	-8	-13	-25	-17	-10	-11	-18	-24	-24	-36	-44	-42	-33	-41	-33	-22	-17	-14	-20
50 MEAN	-119	-100	-82	-121	-73	-59	-62	-92	-99	-133	-165	-225	-133	-133	-125	-133	-275	-315	-200	-132	-94	-80	-82	-109	-135

VALUES ARE EXPRESSED IN GAMMAS

MARCH 1970 AL INVOICES

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	-250	-80	-68	-199	-66	-98	-150	-337	-320	-336	-270	-218	-143	-271	-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	-339	-325	-224	-338	-137	-61	-130
4	-78	-85	-176	-67	-40	-36	-66	-65	-178	-317	-253	-444	-493	-481	-493	-450	-263	-622	-470	-394	-260	-209	-135	-204	-261
5	-116	-38	-21	-16	-18	-15	-54	-63	-106	-23	-21	-15	-15	-10	-28	-60	-179	-269	-530	-475	-321	-312	-173	-201	-128
6	-244	-204	-116	-36	-7	-5	-19	-81	-334	-293	-671	-165	-80	-67	-167	-199	-299	-319	-372	-289	-475	-463	-581	-566	-253
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
8	-250	-223	-326	-725	-752	-703	-425	-383	-275	-182	-431	-473	-369	-537	-525	-1638	-363	-117	-743	-1216	-633	-552	-326	-223	-597
9	-117	-138	-367	-675	-232	-92	-45	-81	-68	-80	-295	-342	-519	-527	-368	-581	-720	-474	-131	-99	-77	-172	-258	-370	-284
10	-226	-55	-66	-37	-26	-29	-40	-79	-169	-87	-106	-120	-54	-33	-41	-51	-120	-116	-237	-212	-242	-76	-35	-41	-96
11	-47	-45	-44	-41	-43	-38	-30	-42	-42	-40	-39	-42	-45	-36	-44	-48	-50	-43	-36	-52	-193	-148	-113	-63	-57
12	-39	-65	-81	-201	-108	-89	-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	-108	-69	-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	-87
15	-32	-110	-119	-118	-176	-200	-137	-58	-43	-40	-115	-70	-26	-15	-124	-256	-104	-21	-27	-120	-70	-32	-19	-20	-87
16	-23	-23	-28	-31	-27	-24	-31	-32	-27	-63	-108	-42	-45	-65	-116	-48	-38	-26	-26	-17	-14	-33	-28	-29	-39
17	-29	-26	-25	-38	-29	-21	-49	-26	-26	-32	-35	-29	-25	-72	-126	-57	-83	-403	-218	-94	-13	-15	-64	-81	-59
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	-48	-32	-33	-42	-80	-32	-59	-261	-102	-67	-60
20	-61	-27	-28	-30	-26	-23	-29	-31	-26	-27	-25	-71	-129	-78	-33	-60	-48	-27	-60	-247	-64	-38	-69	-79	-56
21	-60	-71	-92	-180	-28	-19	-32	-33	-21	-27	-34	-33	-42	-30	-40	-150	-179	-114	-39	-9	-11	-19	-17	-21	-52
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	-91	-50	-81	-21	-20	-30	-35	-44
24	-36	-32	-28	-20	-23	-27	-28	-27	-28	-33	-33	-33	-26	-25	-16	-17	-23	-17	-4	-1	-7	-17	-28	-29	-23
25	-34	-36	-31	-32	-25	-19	-32	-80	-34	-26	-29	-23	-34	-32	-20	-24	-23	-20	-32	-18	-12	-14	-21	-28	-28
26	-30	-31	-28	-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	-23	-38	-38	-28	-32	-10	-10	-38	-57	-79	-64	-56	-51	-36	-36	-80	-179	-175	-94	-189	-321	-286	-86
28	-135	-121	-123	-225	-267	-317	-287	-154	-136	-352	-611	-469	-254	-212	-239	-314	-276	-106	-77	-298	-187	-159	-49	-455	-261
29	-319	-140	-282	-221	-18	-10	-100	-164	-129	-61	-73	-112	-408	-284	-258	-382	-275	-284	-229	-273	-180	-188	-108	-257	-202
30	-321	-20	-16	-17	-25	-80	-93	-174	-255	-141	-266	-370	-298	-219	-75	-107	-231	-118	-61	-45	-138	-236	-32	-80	-147
31	-24	-48	-93	-460	-207	-74	-130	-624	-409	-343	-539	-411	-173	-180	-584	-498	-230	-118	-60	-73	-118	-66	-150	-355	-233
MEAN	-115	-85	-103	-127	-102	-88	-81	-104	-130	-133	-166	-161	-132	-131	-223	-221	-165	-140	-162	-178	-136	-126	-123	-145	-137
50 MEAN	-40	-36	-41	-42	-26	-22	-29	-44	-38	-35	-49	-47	-37	-36	-44	-53	-56	-27	-19	-14	-11	-18	-24	-28	-34
50 MEAN	-220	-198	-254	-380	-232	-194	-132	-213	-302	-276	-479	-351	-278	-115	-760	-750	-417	-307	-402	-454	-295	-271	-301	-374	-340

VALUES ARE EXPRESSED IN GAMMAS

AL INDOICES

APRIL 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
1	-46	-61	-65	-100	-82	-47	-87	-77	-86	-54	-46	-42	-83	-44	-44	-45	-50	-49	-45	-38	-27	-34	-54	-40	-56
2	-33	-33	-31	-35	-24	-32	-37	-41	-40	-38	-51	-43	-48	-87	-246	-152	-52	-47	-75	-39	-25	-13	-28	-110	-64
3	-70	-67	-56	-101	-252	-212	-203	-67	-39	-106	-228	-164	-164	-281	-75	-138	-169	-96	-12	-6	-5	-13	-28	-27	-184
4	-70	-76	-235	-116	-28	-30	-52	-228	-230	-90	-43	-156	-238	-58	-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	-115	-93	-25	-14	-1	-11	-20	-20	-71
6	-27	-65	-126	-109	-262	-195	-448	-298	-117	-176	-768	-508	-247	-220	-255	-283	-216	-185	-52	-4	-28	-139	-233	-75	-208
7	-33	-178	-118	-13	-24	-119	-256	-116	-368	-125	-36	-43	-47	-34	-38	-23	-32	-28	-54	-13	-20	-17	-22	-31	-74
8	-262	-190	-20	-39	-159	-136	-24	-24	-99	-296	-269	-73	-47	-131	-48	-35	-69	-73	-34	-27	-20	-48	-147	-125	-100
9	-36	-27	-20	-75	-281	-120	-135	-135	-321	-198	-85	-318	-339	-439	-80	-51	-45	-68	-32	-8	-4	-71	-126	-98	-129
10	-68	-27	-23	-23	-26	-26	-31	-36	-34	-30	-33	-31	-27	-26	-41	-45	-47	-35	-26	-20	-17	-38	-102	-143	-40
11	-170	-133	-126	-95	-116	-67	-59	-80	-208	-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
13	-78	-25	-23	-25	-28	-27	-22	-29	-25	-23	-34	-68	-118	-105	-67	-13	-17	-23	-12	-6	-13	-21	-24	-30	-35
14	-26	-27	-30	-38	-30	-27	-22	-23	-30	-28	-42	-44	-42	-45	-52	-29	-25	-16	-19	-7	-14	-18	-48	-45	-31
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	-69	-133	-217	-210	-108	-90	-46	-37	-48	-37	-34	-32	-29	-25	-19	-12	-14	-119	-481	-519	-435	-452	-154
17	-463	-334	-280	-233	-343	-159	-66	-35	-117	-421	-258	-117	-101	-342	-316	-266	-194	-274	-326	-151	-316	-511	-220	-41	-246
18	-35	-26	-35	-28	-19	-17	-19	-17	-51	-202	-468	-492	-537	-533	-330	-94	-123	-53	-66	-20	-32	-283	-521	-532	-190
19	-22	-334	-419	-308	-240	-128	-35	-498	-397	-288	-470	-458	-131	-61	-34	-79	-103	-145	-94	-43	-62	-116	-19	-11	-215
20	-18	-44	-122	-248	-278	-148	-62	-34	-27	-33	-67	-156	-341	-485	-143	-228	-308	-670	-339	-3	-23	-40	-122	-177	-159
21	-126	-265	-132	-98	-236	-367	-408	-298	-475	-353	-306	-529	-721	-561	-593	-620	-868	-989	-588	-317	-477	-704	-491	-393	-460
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	-528	-528	-395	-262	-158	-301	-400	-358	-224	-67	-298	-359	-234
24	-169	-181	-339	-208	-153	-211	-253	-242	-165	-131	-158	-208	-275	-268	-167	-585	-347	-353	-724	-90	-137	-124	-58	-51	-280
25	-42	-276	-105	-217	-293	-173	-219	-176	-269	-214	-231	-337	-213	-198	-122	-178	-70	-18	-59	-210	-216	-139	-173	-211	-285
26	-242	-211	-113	-157	-35	-30	-40	-28	-28	-38	-46	-38	-133	-263	-178	-73	-63	-151	-241	-453	-321	-223	-174	-340	-151
27	-38	-198	-150	-165	-77	-153	-207	-55	-26	-28	-30	-146	-168	-116	-106	-94	-57	-74	-185	-97	-7	-20	-27	-36	-107
28	-124	-368	-222	-155	-117	-132	-105	-94	-61	-32	-29	-43	-109	-116	-65	-52	-30	-25	-13	-12	-26	-68	-42	-32	-86
29	-32	-46	-102	-113	-113	-120	-71	-25	-70	-179	-62	-85	-219	-208	-181	-75	-198	-263	-330	-108	-29	-71	-208	-100	-230
30	-43	-112	-414	-438	-361	-114	-215	-149	-260	-335	-208	-102	-39	-38	-144	-227	-303	-146	-15	-61	-102	-108	-103	-230	-185
MEAN	-142	-146	-142	-142	-147	-125	-143	-114	-140	-161	-174	-175	-177	-186	-138	-138	-140	-150	-137	-84	-96	-124	-135	-130	-141
50 MEAN	-54	-94	-63	-93	-44	-46	-40	-39	-35	-40	-35	-45	-67	-66	-58	-40	-62	-64	-30	-41	-68	-48	-58	-69	-55
50 MEAN	-253	-278	-247	-271	-298	-256	-246	-162	-191	-261	-362	-284	-289	-322	-276	-296	-336	-375	-265	-101	-174	-201	-221	-136	-259

VALUES ARE EXPRESSED IN GAMMAS

AL INDICES

MAY 1970

UT

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	-26	-32	-32	-61	-291	-163	-71	-50	-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	-89	-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	-408	-233	-180
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	-105
5	-76	-60	-36	-49	-34	-16	-27	-40	-33	-124	-420	-22	-137	-110	-162	-144	-90	-121	-71	-45	-17	-49	-53	-190	-105
6	-144	-48	-43	-42	-34	-37	-33	-36	-41	-71	-65	-63	-120	-103	-60	-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	-46	-58	-98	-47	-27	-30	-33	-44
8	-38	-73	-38	-30	-31	-27	-28	-31	-27	-38	-37	-34	-29	-27	-21	-29	-82	-37	-137	-100	-87	-75	-69	-105	-60
9	-79	-80	-60	-53	-111	-111	-73	-63	-33	-23	-39	-44	-45	-43	-39	-68	-94	-74	-49	-65	-32	-27	-29	-32	-57
10	-28	-23	-28	-67	-66	-31	-23	-32	-66	-44	-43	-34	-39	-37	-39	-46	-40	-22	-14	-20	-18	-23	-28	-30	-35
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
12	-101	-86	-98	-125	-134	-40	-16	-38	-42	-68	-177	-245	-271	-320	-314	-239	-300	-273	-235	-171	-591	-370	-227	-89	-178
13	-81	-93	-291	-377	-399	-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	-46	-134	-165	-34	-188	-77	-24	-29	-38	-27	-31	-72	-221	-339	-103	-144	-354	-181	-124	-218	-163
15	-213	-112	-77	-56	-39	-78	-67	-34	-142	-349	-219	-43	-32	-27	-40	-42	-23	-89	-64	-85	-89	-41	-39	-48	-98
16	-78	-44	-49	-51	-53	-155	-146	-52	-161	-51	-19	-18	-29	-54	-172	-153	-188	-270	-96	-77	-85	-49	-38	-161	-94
17	-278	-135	-37	-28	-146	-382	-199	-41	-11	-17	-31	-112	-140	-67	-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	-22	-99	-89	-217	-168	-50	-27	-153	-124	-75	-11	-15	-30	-93	-74	-22	-31	-145	-126	-49	-101
20	-157	-184	-133	-104	-267	-302	-108	-43	-28	-151	-257	-150	-169	-266	-148	-277	-302	-264	-124	-94	-282	-203	-145	-215	-161
21	-68	-54	-246	-105	-28	-16	-159	-105	-117	-164	-220	-145	-99	-125	-183	-200	-78	-72	-125	-136	-111	-46	-60	-255	-168
22	-203	-225	-283	-126	-57	-47	-94	-99	-24	-20	-30	-79	-76	-73	-175	-182	-195	-314	-284	-110	-58	-71	-42	-38	-119
23	-37	-42	-17	-46	-40	-34	-17	-36	-159	-125	-89	-111	-55	-27	-49	-75	-54	-180	-176	-129	-95	-121	-286	-21	-94
24	-183	-127	-19	-55	-11	-39	-28	-23	-33	-82	-125	-164	-71	-74	-106	-111	-133	-104	-22	-16	-11	-63	-70	-153	-79
25	-173	-254	-111	-229	-266	-255	-257	-58	-33	-27	-50	-184	-247	-242	-250	-118	-175	-178	-114	-56	-83	-79	-117	-58	-150
26	-24	-24	-26	-35	-31	-22	-17	-38	-33	-47	-51	-49	-34	-31	-45	-109	-92	-65	-82	-54	-42	-41	-55	-28	-45
27	-55	-38	-37	-77	-23	-108	-159	-103	-168	-156	-49	-54	-193	-317	-176	-125	-338	-489	-17	-325	-458	-29	-55	-476	-221
28	-224	-596	-241	-58	-26	-23	-27	-20	-45	-155	-60	-54	-53	-62	-435	-320	-296	-111	-85	-146	-71	-55	-40	-123	-229
29	-242	-190	-90	-57	-196	-191	-272	-309	-237	-73	-90	-82	-155	-128	-43	-48	-72	-66	-6	-13	-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	-17	-36	-44	-54	-82
MEAN	-117	-110	-62	-84	-99	-93	-88	-76	-62	-99	-128	-109	-113	-135	-112	-100	-119	-139	-110	-92	-95	-98	-102	-117	-104
50 MEAN	-48	-47	-37	-42	-55	-45	-35	-38	-38	-36	-42	-41	-39	-36	-36	-57	-66	-84	-68	-53	-41	-43	-58	-71	-67
50 MEAN	-152	-219	-120	-83	-139	-135	-116	-119	-104	-121	-271	-215	-272	-355	-223	-202	-262	-237	-174	-169	-245	-236	-157	-202	-188

JUNE		VALUES ARE EXPRESSED IN GAMMAS																								
UT		AL INDICES																								
		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
0	1	-55	-69	-100	-133	-220	-191	-135	-75	-65	-413	-156	-179	-204	-334	-471	-414	-241	-323	-103	-146	-119	-208	-231	-130	-221
	2	-171	-86	-117	-192	-151	-99	-41	-46	-32	-19	-40	-36	-58	-70	-70	-118	-185	-137	-130	-143	-161	-111	-108	-195	-185
	3	-79	-77	-230	-231	-327	-310	-217	-119	-225	-269	-267	-249	-315	-147	-178	-193	-159	-49	-112	-190	-119	-139	-131	-228	-198
	4	-218	-206	-296	-91	-202	-158	-110	-160	-198	-181	-157	-118	-163	-151	-276	-180	-84	-59	-62	-19	-25	-28	-141	-207	-148
	5	-64	-56	-138	-256	-126	-195	-273	-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	-64	-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	-209	-299	-179	-202	-84	-85
	8	-264	-272	-347	-198	-167	-389	-345	-70	-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	-105	-140	-61	-106	-60	-31	-62	-104	-87	-95	-171	-155	-146	-157	-99	-27	-37	-85
Q	11	-81	-111	-179	-92	-30	-33	-35	-48	-57	-37	-35	-33	-34	-29	-32	-50	-42	-150	-131	-106	-69	-38	-36	-36	-64
	12	-58	-81	-81	-103	-108	-75	-65	-34	-67	-74	-101	-80	-63	-64	-46	-17	-25	-20	-49	-82	-80	-74	-76	-67	-87
	13	-65	-49	-44	-48	-65	-35	-113	-245	-183	-258	-333	-288	-349	-374	-284	-92	-53	-111	-136	-07	-125	-134	-96	-74	-151
	14	-96	-132	-167	-241	-142	-100	-53	-56	-54	-43	-40	-35	-22	-19	-24	-43	-39	-48	-56	-256	-108	-24	-37	-79	-80
	15	-325	-298	-222	-131	-69	-189	-209	-104	-205	-265	-305	-370	-256	-200	-128	-112	-92	-155	-121	-61	-58	-282	-153	-156	-196
D	16	-186	-159	-160	-164	-159	-260	-184	-29	-20	-22	-29	-30	-82	-43	-79	-58	-68	-80	-30	-62	-117	-51	-92	-148	-97
	17	-48	-28	-30	-34	-32	-15	-36	-41	-27	-37	-41	-56	-179	-250	-135	-45	-67	-213	-206	-71	-179	-279	-264	-334	-131
	18	-307	-243	-35	-39	-38	-47	-47	-184	-385	-425	-621	-586	-615	-404	-445	-426	-313	-163	-98	-225	-268	-309	-414	-262	-292
	19	-241	-290	-299	-132	-38	-50	-161	-53	-43	-100	-133	-87	-52	-55	-63	-59	-39	-41	-95	-117	-76	-261	-292	-374	-131
	20	-488	-544	-419	-347	-425	-354	-277	-386	-428	-375	-222	-368	-364	-353	-356	-521	-528	-460	-289	-263	-167	-421	-397	-447	-400
Q	21	-495	-408	-659	-448	-404	-397	-470	-53	-403	-273	-235	-337	-194	-294	-352	-211	-179	-115	-46	-17	-13	-50	-27	-34	-259
	22	-51	-84	-60	-63	-45	-51	-49	-51	-36	-40	-50	-90	-52	-42	-39	-47	-24	-17	-26	-87	-106	-69	-60	-52	-59
	23	-65	-115	-351	-45	-50	-77	-59	-29	-68	-40	-36	-42	-30	-23	-21	-27	-28	-29	-22	-13	-28	-39	-28	-33	-42
	24	-31	-99	-254	-36	-35	-65	-31	-36	-64	-26	-27	-29	-24	-23	-40	-29	-22	-9	-25	-48	-232	-65	-93	-158	-55
	25	-195	-310	-74	-28	-28	-29	-123	-75	-85	-115	-17	-20	-44	-39	-133	-126	-77	-37	-68	-64	-58	-68	-188	-138	-120
Q	26	-23	-38	-21	-65	-144	-182	-152	-275	-213	-269	-118	-36	-54	-36	-45	-228	-318	-214	-312	-356	-288	-39	-99	-22	-162
	27	-87	-55	-155	-40	-401	-206	-168	-11	-457	-599	-217	-124	-447	-347	-175	-27	-44	-140	-58	-23	-59	-74	-70	-23	-191
	28	-50	-146	-329	-104	-141	-201	-108	-57	-23	-56	-20	-204	-30	-50	-245	-92	-23	-58	-54	-27	-42	-42	-55	-56	-134
	29	-74	-66	-27	-21	-35	-99	-141	-231	-67	-25	-30	-40	-30	-32	-19	-92	-210	-228	-175	-250	-263	-247	-152	-85	-107
	30	-40	-48	-35	-31	-29	-32	-41	-218	-258	-232	-209	-166	-132	-35	-25	-16	-9	-1	2	-6	-8	-21	-25	-46	-68
MEAN		-132	-142	-150	-166	-132	-131	-127	-127	-146	-152	-144	-142	-156	-145	-128	-116	-105	-105	-97	-106	-134	-126	-127	-136	-132
5Q MEAN		-57	-84	-81	-68	-61	-61	-52	-47	-68	-47	-67	-58	-44	-42	-32	-36	-30	-48	-46	-40	-58	-58	-46	-40	-53
5D MEAN		-204	-264	-254	-337	-328	-259	-219	-256	-340	-417	-310	-319	-305	-362	-340	-350	-269	-236	-135	-139	-169	-242	-258	-181	-273

JULY		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	1	-37	-93	-103	-161	-250	-161	-245	-211	-248	-193	-47	-59	-57	-130	-313	-86	-34	-57	-27	-16	-18	-15	-14	-30	-110
2	2	-30	-33	-25	-29	-59	-135	-198	-295	-216	-71	-131	-77	-79	-9	-7	-19	-40	-18	-10	-26	-30	-29	-25	-46	-81
3	3	-152	-102	-138	-114	-253	-441	-412	-324	-348	-399	-366	-208	-145	-146	-83	-44	-37	-24	-25	-14	-50	-117	-264	-867	-212
4	4	-755	-592	-161	-74	-206	-370	-412	-201	-361	-136	-117	-55	-33	-67	-47	-46	-42	-20	-17	-27	-28	-32	-44	-47	-155
5	5	-57	-50	-49	-80	-306	-448	-321	-177	-196	-50	-32	-35	-30	-43	-89	-84	-142	-273	-62	-23	-36	-46	-51	-195	-125
6	6	-446	-227	-296	-204	-237	-142	-298	-221	-406	-262	-175	-138	-265	-205	-34	-19	-10	-4	-1	-3	-12	-20	-35	-37	-162
7	7	-37	-40	-40	-37	-33	-31	-23	-32	-120	-127	-89	-42	-32	-26	-17	-15	-16	-13	-8	-47	-136	-150	-139	-286	-65
8	8	-142	-73	-182	-273	-279	-375	-297	-185	-79	-36	-25	-20	-106	-295	-463	-152	-186	-329	-275	-190	-204	-175	-255	-575	-199
9	9	-519	-233	-40	-233	-391	-327	-196	-116	-130	-356	-517	-576	-697	-709	-495	-409	-208	-114	-120	-154	-430	-421	-396	-433	-343
10	10	-706	-187	-64	-57	-38	-37	-45	-39	-34	-26	-16	-13	-108	-103	-118	-309	-274	-321	-170	-213	-286	-293	-176	-144	-160
11	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	12	-333	-286	-239	-318	-161	-86	-84	-90	-123	-189	-70	-67	-185	-191	-171	-272	-211	-30	-143	-264	-56	-85	-226	-155	-166
13	13	-144	-130	-257	-282	-87	-239	-153	-53	-21	-22	-45	-38	-35	-58	-74	-90	-170	-338	-343	-76	-79	-198	-149	-71	-131
14	14	-83	-192	-200	-65	-140	-63	-41	-59	-218	-145	-63	-35	-27	-26	-18	-22	-20	-37	-300	-258	-68	-92	-60	-187	-99
15	15	-170	-50	-55	-87	-60	-24	-20	-31	-54	-231	-231	-156	-51	-11	-3	-2	-5	-13	-24	-19	-25	-31	-51	-82	-61
16	16	-171	-279	-277	-100	-77	-110	-42	-34	-30	-29	-27	-60	-217	-219	-40	-14	-73	-140	-293	-151	-58	-32	-24	-24	-103
17	17	-25	-37	-61	-55	-12	-11	-18	-25	-25	-31	-31	-32	-40	-53	-171	-127	-236	-384	-134	-63	-96	-221	-297	-184	-96
18	18	-38	-35	-67	-84	-58	-90	-31	-19	-16	-26	-49	-48	-34	-23	-22	-35	-23	-18	-23	-76	-112	-82	-84	-34	-47
19	19	-34	-39	-40	-145	-106	-95	-45	-30	-27	-41	-135	-96	-19	-19	-18	-46	-106	-236	-92	-28	-35	-142	-134	-210	-83
20	20	-125	-93	-89	-97	-50	-83	-106	-74	-18	-62	-38	-32	-26	-31	-25	-23	-31	-30	-69	-124	-163	-122	-206	-451	-98
21	21	-534	-257	-139	-118	-141	-51	-19	-17	-69	-61	-94	-277	-178	-373	-430	-161	-142	-81	-402	-347	-152	-152	-397	-486	-208
22	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	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	-28
24	24	-87	-296	-419	-492	-311	-258	-389	-142	-26	-30	-32	-44	-156	-255	-299	-330	-130	-114	-183	-135	-9	-43	-204	-239	-192
25	25	-643	-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	26	-473	-580	-414	-420	-101	-113	-382	-174	-280	-311	-376	-418	-383	-273	-82	-33	-23	-22	-31	-35	-58	-114	-366	-77	-232
27	27	-51	-54	-82	-113	-174	-302	-199	-38	-29	-208	-207	-160	-149	-241	-204	-299	-271	-269	-150	-263	-190	-62	-98	-221	-164
28	28	-80	-34	-40	-40	-34	-29	-22	-19	-28	-51	-35	-30	-29	-21	-29	-28	-26	-29	-34	-34	-43	-51	-80	-67	-38
29	29	-159	-112	-55	-133	-516	-612	-560	-530	-612	-718	-660	-461	-391	-357	-314	-459	-313	-312	-404	-307	-75	-25	-19	-31	-338
30	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	31	-232	-360	-156	-283	-279	-201	-145	-199	-298	-200	-204	-233	-245	-222	-149	-251	-339	-547	-493	-145	-85	-233	-464	-292	-264
MEAN	MEAN	-228	-170	-169	-156	-164	-187	-181	-147	-170	-166	-153	-155	-140	-157	-126	-122	-117	-143	-134	-111	-99	-130	-183	-216	-155
50 MEAN	50 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
50 MEAN	50 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												MEAN		
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					
Q	-204-130-165	-115-23-30	-209-207-115	-21-25-51	-27-49-34	-26-19-21	-35-38-54	-42-67-42	-27-24-26	-29-55-26	-21-24-21	-17-13-20	-31-32-29	-57															
Q	-59-85-203	-209-207-115	-21-25-51	-27-49-34	-26-19-21	-35-38-54	-42-67-42	-27-24-26	-29-55-26	-21-24-21	-17-13-20	-31-32-29	-57																
Q	-32-36-31	-27-49-34	-26-19-21	-35-38-54	-42-67-42	-27-24-26	-29-55-26	-21-24-21	-17-13-20	-31-32-29	-57																		
Q	-27-25-24	-40-42-29	-21-14-37	-100-53	-27-30-50	-128-69-33	-20-58-115	-57-44-40																					
Q	-44-28-51	-87-113-65	-32-24-12	-21-31-31	-20-29-24	-20-21-22	-10-12-26	-34-23-23																					
6	-20-21-19	-16-25-31	-25-27-24	-140-115-26	-30-31-31	-25-25-17	-7-16-42	-200-164-250	-56																				
7	-139-80-35	-26-19-19	-19-48-36	-31-30-27	-40-48-57	-114-177-51	-42-19-63	-152-552-344	-90																				
8	-156-87-198	-165-38-44	-115-176-519	-657-531-434	-200-54-72	-135-50-63	-224-292-83	-117-190-310	-295																				
9	-462-610-267	-164-104-134	-115-98-115	-98-210-630	-198-107-44	-35-38-215	-334-83-42	-35-38-28	-159																				
10	-25-90-123	-130-26-47	-111-100-191	-176-97-263	-257-87-16	-29-92-59	-35-52-33	-39-88-74	-93																				
11	-78-67-83	-114-194-60	-39-44-130	-216-115-75	-42-172-206	-125-30-29	-24-131-109	-68-145-406	-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	-142																				
13	-33-43-66	-57-21-108	-125-55-62	-90-130-61	-45-165-81	-31-62-96	-115-246-225	-277-335-94	-110																				
14	-30-27-78	-188-111-30	-36-26-22	-29-30-35	-35-32-28	-92-81-67	-53-54-50	-76-69-72	-38																				
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	-65																				
16	-152-42-90	-37-21-57	-92-106-94	-84-100-101	-194-186-48	-24-38-124	-289-84-46	-35-418-643	-189																				
17	-368-151-237	-423-679-263	-803-446-330	-313-527-390	-284-435-297	-313-582-668	-683-506-89	-101-234-337	-300																				
18	-210-453-285	-360-252-118	-179-334-310	-298-495-489	-650-502-390	-244-585-723	-428-115-76	-128-268-561	-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	-31-37-62	-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	-61-85-95	-96-69-53	-58-57-162	-388-243-194	-160-229-196	-164-137-78	-29-40-74	-116																				
23	-102-82-80	-139-198-121	-197-152-237	-209-126-86	-203-101-46	-51-56-125	-69-21-16	-26-23-27	-104																				
24	-29-34-33	-136-88-25	-25-30-34	-40-39-40	-45-83-77	-54-71-59	-123-77-66	-106-113-71	-60																				
25	-69-76-89	-168-170-215	-286-342-247	-202-198-214	-272-295-288	-213-244-192	-77-120-182	-176-196-128	-194																				
26	-215-155-22	-82-469-402	-265-324-290	-510-413-452	-530-452-278	-405-298-180	-166-108-113	-216-124-124	-200																				
27	-267-262-208	-123-166-363	-321-64-41	-110-92-20	-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	-224-170-244	-133																				
29	-78-34-67	-356-386-205	-131-168-201	-136-37-48	-183-120-104	-203-108-58	-37-34-48	-27-31-43	-118																				
30	-64-235-202	-161-106-92	-97-98-123	-40-40-31	-39-46-43	-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	-183-200-249	-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																				
50 MEAN	-67-52-61	-81-51-37	-28-25-32	-48-45-42	-31-40-46	-69-55-32	-38-26-53	-55-50-43	-46																				
30 MEAN	-321-293-202	-243-324-192	-380-276-334	-368-439-439	-355-310-216	-226-311-370	-371-221-81	-119-170-272	-281																				

SEPTEMBER 1970		AL INDICES										VALUES ARE EXPRESSED IN GAMMAS													MEAN	
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
D	1	-25	-12	-16	-10	-15	-10	-56	-349	-436	-350	-619	-236	-49	-83	-146	-361	-275	-337	-486	-437	-350	-139	-95	-51	-207
	2	-177	-136	-40	-16	-13	-33	-29	-24	-26	-104	-353	-667	-196	-169	-127	-99	-147	-320	-243	-64	-73	-165	-98	-32	-123
	3	-21	-23	-32	-287	-322	-40	-19	-63	-253	-396	-252	-287	-168	-69	-41	-165	-201	-74	-39	-52	-72	-245	-334	-193	-160
	4	-60	-71	-63	-32	-19	-19	-60	-76	-105	-44	-38	-81	-263	-36	-20	-65	-256	-47	-85	-79	-146	-164	-33	-53	-79
	5	-151	-54	-43	-60	-132	-66	-8	-15	-20	-27	-38	-29	-46	-72	-62	-216	-397	-170	-139	-161	-122	-95	-221	-94	-102
Q	6	-25	-21	-42	-42	-39	-25	-16	-16	-18	-25	-30	-36	-33	-29	-46	-183	-168	-123	-221	-78	-40	-35	-135	-38	-61
	7	-28	-60	-43	-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	-180	-16	-25	-29	-29	-113
Q	9	-22	-19	-21	-31	-74	-31	-28	-21	-28	-32	-35	-28	-48	-60	-63	-46	-119	-62	-28	-88	-368	-114	-305	-213	-86
Q	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	-295	-358	-175	-206	-178	-26	-22	-25	-27	-20	-23	-24	-25	-62	-13	-11	-7	-18	-11	-9	-68
Q	13	-9	-14	-21	-17	-130	-397	-353	-348	-369	-479	-530	-410	-396	-427	-372	-101	-217	-226	-44	-137	-527	-376	-240	-623	-271
Q	14	-121	-226	-296	-122	-40	-11	-43	-107	-33	-160	-132	-679	-471	-844	-376	-823	-245	-174	-151	-260	-398	-173	-91	-158	-246
Q	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	-63	-212	-61	-119	-159	-203	-135	-198	-66	-110	-127	-163	-145	-50	-31	-25	-49	-174	-166	-160	-63	-27	-26	-113
	17	-27	-128	-174	-148	-156	-358	-458	-188	-167	-43	-19	-24	-48	-26	-40	-189	-190	-148	-11	-54	-54	-66	-119	-63	-117
	18	-65	-198	-174	-315	-195	-123	-123	-245	-271	-123	-79	-24	-19	-36	-55	-232	-34	-87	-176	-50	-51	-131	-175	-34	-127
	19	-12	-17	-85	-163	-205	-138	-227	-189	-295	-309	-56	-161	-194	-250	-233	-173	-356	-29	-371	-466	-225	-165	-306	-11	-247
	20	-100	-100	-36	-25	-82	-323	-262	-110	-06	-318	-61	-176	-225	-70	-119	-262	-280	-179	-81	-107	-149	-90	-116	-441	-105
D	21	-337	-204	-274	-243	-184	-262	-714	-425	-339	-105	-16	-115	-555	-886	-483	-279	-178	-289	-268	-202	-62	-116	-59	-72	-262
	22	-38	-27	-268	-184	-25	-212	-29	-20	-57	-176	-15	-109	-108	-72	-71	-100	-140	-429	-278	-42	-56	-31	-151	-94	-148
	23	-84	-125	-41	-25	-20	-18	-133	-37	-359	-357	-84	-165	-173	-64	-79	-60	-132	-167	-46	-39	-21	-18	-21	-33	-119
	24	-178	-19	-64	-168	-175	-154	-170	-233	-298	-199	-26	-20	-24	-21	-34	-30	-22	-43	-101	-291	-32	-27	-52	-39	-184
	25	-21	-22	-21	-91	-106	-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	-204	-489	-241	-235	-320	-258	-294	-87	-38	-69	-196	-130	-111	-69	-315	-167	-250	-312	-263	-42	-49	-308	-271	-239
	28	-307	-94	-32	-59	-58	-44	-18	-8	-6	-13	-23	-27	-32	-29	-24	-25	-20	-13	-26	-14	-18	-16	-20	-17	-39
Q	29	-26	-24	-21	-12	-5	-16	-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	-16	-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	-106	-123
5Q MEAN		-17	-18	-23	-23	-78	-69	-54	-61	-56	-26	-28	-30	-36	-32	-35	-62	-73	-59	-58	-40	-86	-78	-96	-58	-50
5Q MEAN		-160	-170	-159	-128	-141	-200	-205	-205	-317	-228	-233	-327	-220	-270	-241	-216	-256	-255	-256	-260	-276	-171	-160	-255	-245

VALUES ARE EXPRESSED IN GANNAS

OCTOBER 1970 AL INDICES

UY	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	-167-193	-44	-23	-68-175	-75	-17	-11	-15	-38	-25	-23	-23	-49	-114	-75	-63	-235-368-294	-78	-65-236	-98					
2	-396-140	-55	-59	-53	-48	-45	-50	-45	-57	-128	-49	-59	-72	-71	-52	-52	-92	-151-157	-86	-77	-96	-65			
3	-116	-78	-74	-69	-71	-40	-41	-36	-40	-55	-40	-45	-52	-49	-93	-295-354-170	-189-257	-152	-274-158-326	-129					
4	-210-176	-120	-290	-358	-95	-242	-263	-245	-163	-388-388	-177	-353	-95	-37	-102	-269	-302	-142	-141	-63	-114	-78			
5	-36	-64	-173	-91	-31	-82	-259	-132	-39	-143	-51	-25	-66	-40	-36	-37	-92	-36	-35	-161	-173	-96	-38	-18	
6	-22	-93	-60	-34	-57	-47	-55	-30	-25	-36	-97	-159	-27	-32	-26	-28	-25	-18	-27	-159	-125	-162	-93	-14	
7	-7	-10	-8	-9	-7	-7	-17	-67	-47	-19	-23	-27	-58	-115	-25	-29	-24	-21	-16	-14	-17	-20	-22	-10	
8	-11	-8	-8	-34	-17	-10	-10	-10	-15	-22	-25	-28	-24	-23	-24	-29	-29	-27	-10	-11	-17	-27	-28	-22	
9	-15	-15	-18	-20	-16	-11	-12	-17	-25	-20	-22	-24	-36	-27	-25	-26	-26	-27	-91	-9	-14	-15	-15	-14	
10	-14	-12	-14	-0	-72	-82	-126	-242	-53	-20	-13	-22	-19	-12	-30	-36	-102	-216	-380	-349	-308	-180	-152	-25	
11	-262	-274	-205	-165	-160	-265	-308	-443	-360	-387	-294	-217	-295	-277	-304	-299	-242	-235	-243	-328	-37	-14	-103	-167	
12	-362	-295	-162	-308	-564	-273	-157	-340	-276	-212	-194	-119	-105	-92	-36	-29	-23	-20	-16	-16	-13	-2	-6	-11	
13	-8	-11	-10	-21	-54	-280	-21	-147	-20	-25	-32	-39	-321	-151	-54	-235	-254	-192	-172	-175	-82	-87	-32	-16	
14	-130	-267	-185	-175	-156	-16	-44	-142	-158	-104	-103	-169	-134	-100	-41	-38	-38	-90	-127	-118	-128	-113	-82	-46	
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	
16	-12	-15	-14	-22	-24	-48	-16	-15	-11	-66	-143	-786	-595	-340	-265	-510	-471	-679	-430	-304	-46	-35	-98	-270	
17	-282	-163	-312	-165	-180	-207	-502	-537	-402	-416	-295	-458	-466	-554	-473	-537	-799	-381	-619	-565	-296	-359	-404	-370	
18	-324	-344	-336	-308	-57	-43	-52	-215	-373	-219	-126	-180	-261	-116	-160	-206	-293	-101	-148	-121	-77	-175	-262	-108	
19	-121	-123	-191	-172	-193	-170	-304	-158	-360	-138	-152	-227	-269	-317	-200	-146	-229	-181	-148	-162	-188	-92	-189	-110	
20	-108	-133	-137	-196	-158	-210	-221	-121	-147	-375	-304	-179	-247	-142	-154	-160	-98	-83	-22	-20	-18	-64	-32	-13	
21	-17	-21	-20	-22	-19	-16	-16	-12	-9	-14	-20	-26	-28	-30	-37	-38	-44	-81	-53	-24	-10	-21	-35	-49	
22	-144	-191	-182	-191	-115	-107	-91	-83	-316	-221	-141	-234	-317	-370	-372	-318	-393	-459	-308	-341	-340	-278	-218	-202	
23	-173	-180	-148	-101	-247	-291	-321	-181	-132	-135	-223	-203	-150	-186	-560	-529	-401	-197	-510	-380	-271	-239	-11	-104	
24	-259	-16	-12	-123	-151	-268	-112	-96	-387	-150	-152	-311	-262	-241	-201	-114	-56	-45	-137	-155	-152	-27	-13	-52	
25	-28	-30	-54	-87	-6	-12	-122	-241	-117	-60	-107	-96	-179	-309	-134	-101	-235	-162	-44	-67	-58	-41	-8	-8	
26	-9	-25	-138	-109	-41	-18	-26	-35	-21	-36	-143	-207	-189	-107	-87	-53	-59	-84	-61	-50	-20	-10	-12	-10	
27	-10	-7	-4	-18	-19	-3	-43	-10	-13	-17	-13	-10	-35	-49	-34	-18	-12	-17	-8	-7	-32	-23	-117	-22	
28	-11	-12	-181	-57	-44	-65	-231	-46	-7	-13	-16	-16	-24	-19	-115	-187	-131	-93	-251	-467	-371	-226	-102	-43	
29	-72	-21	1	0	-4	-77	-143	-23	5	-29	-17	-45	-51	-121	-62	-35	-122	-249	-383	-464	-357	-187	-34	-251	
30	-104	-89	-242	-217	-114	0	0	-14	-10	-27	-37	-145	-34	-20	-24	-105	-214	-32	-16	-20	-22	-30	-23	-13	
31	-6	-10	-8	-2	-21	-12	-3	0	-11	-118	-8	-7	-30	-45	-87	-144	-48	-37	-19	-57	-81	-29	-12	-10	
MEAN	-114	-184	-101	-102	-102	-99	-123	-120	-120	-109	-110	-145	-146	-162	-130	-149	-164	-143	-167	-178	-125	-107	-94	-98	
50 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	
50 MEAN	-164	-176	-186	-177	-173	-137	-227	-242	-233	-200	-235	-403	-330	-309	-311	-379	-413	-341	-409	-302	-166	-172	-196	-202	

VALUES ARE EXPRESSED IN GAMMAS

AL INDICES

NOVEMBER 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
0	-10	-10	-12	-11	-11	-10	-10	-10	-12	-17	-34	-74	-22	-31	-31	-35	-59	-45	-26	-19	-20	-23	-20	-10	-24
1	-29	-23	-41	-39	-37	-25	-16	-23	-103	-182	-43	-66	-229	-210	-103	-64	-39	-26	-22	-10	-13	-11	-16	-41	-52
2	-98	-98	-19	-46	-76	-24	-13	-45	-112	-74	-15	-14	-70	-24	-87	-233	-266	-117	-271	-216	-129	-271	-135	-63	-111
3	-122	-72	-56	-43	-39	-26	-18	-31	-133	-91	-69	-118	-44	-31	-32	-60	-102	-107	-51	-96	-78	-186	-91	-40	-73
4	-30	-89	-36	-13	-25	-44	-92	-20	-97	-89	-39	-70	-76	-41	-43	-167	-131	-60	-71	-199	-382	-358	-215	-167	-102
5	-112	-143	-152	-209	-12	-232	-206	-231	-134	-341	-344	-329	-480	-184	-555	-244	-152	-85	-44	-41	-69	-192	-132	-88	-217
6	-133	-138	-163	-388	-102	-399	-343	-175	-650	-525	-597	-142	-390	-597	-599	-229	-509	-210	-233	-376	-170	-249	-131	-440	-429
7	-239	-99	-156	-165	-45	-49	-24	-54	-101	-186	-183	-215	-123	-176	-233	-169	-62	-50	-147	-187	-20	-20	-21	-35	-119
8	-85	-29	-25	-40	-88	-188	-171	-240	-203	-207	-200	-176	-127	-53	-69	-410	-344	-238	-237	-126	-185	-102	-10	-14	-153
9	-54	-170	-259	-75	-140	-224	-50	-30	-23	-217	-674	-684	-260	-170	-286	-569	-342	-221	-194	-72	-189	-120	-24	-118	-196
10	-270	-428	-235	-254	-95	-133	-334	-166	-206	-395	-358	-123	-209	-267	-198	-274	-374	-138	-26	-42	-171	-245	-42	-47	-209
11	-117	-50	-90	-163	-176	-78	-93	-113	-206	-251	-208	-166	-100	-399	-447	-181	-301	-29	-14	-20	-20	-14	-16	-13	-141
12	-16	-50	-132	-175	-26	-85	-134	-41	-10	-16	-132	-236	-113	-355	-323	-338	-289	-381	-60	-181	-18	-127	-136	-256	-169
13	-287	-269	-49	-12	-24	-85	-52	-65	-68	-53	-25	-26	-29	-35	-132	-121	-224	-267	-221	-141	-59	-60	-10	-6	-101
14	-5	-5	-6	-6	-6	-7	-7	-7	-12	-46	-55	-157	-59	-38	-74	-28	-27	-21	-32	-83	-138	-40	-11	-8	-35
15	-13	-8	-7	-7	-8	-9	-1	-3	-6	-21	-145	-114	-75	-23	-14	-38	-149	-227	-124	-8	-30	-100	-36	-65	-51
16	-69	-100	-64	-146	-116	-12	0	-6	-18	-9	-75	-172	-110	-35	-16	-29	-24	-22	-19	-13	-15	-18	-16	-20	-46
17	-45	-20	-6	-34	-16	-46	-27	-26	-11	-4	-5	-47	-457	-253	-383	-357	-86	-29	-18	-15	-16	-74	-422	-383	-117
18	-225	-212	-277	-322	-228	-297	-182	-32	-41	-8	-45	-29	-38	-27	-31	-24	-19	-23	-21	-19	-20	-20	-21	-18	-90
19	-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
20	-12	-76	-211	-312	-129	-26	-8	-243	-525	-920	-935	-844	-609	-667	-723	-439	-218	-242	-238	-249	-229	-230	-247	-152	-356
21	-366	-284	-315	-334	-85	-54	-18	-70	-108	-183	-301	-242	-279	-457	-434	-438	-559	-360	-455	-313	-335	-251	-248	-255	-203
22	-220	-294	-267	-332	-177	-229	-271	-353	-420	-541	-443	-396	-109	-242	-832	-885	-550	-316	-150	-272	-160	-163	-335	-202	-364
23	-64	-75	-94	-103	-61	-62	-13	-21	-42	-24	-28	-19	-28	-23	-27	-71	-280	-426	-259	-131	-44	-61	-25	-63	-84
24	-68	-100	-100	-4	0	-11	-20	-27	-54	-251	-95	-95	-95	-41	-111	-232	-270	-348	-402	-147	-55	-46	-46	-89	-114
25	-67	-27	1	-5	-31	-43	-4	-2	-9	-34	-74	-75	-36	-20	-55	-266	-276	-69	-24	-94	-389	-81	-49	-12	-73
26	-13	-15	-57	-26	-30	-31	-17	-17	-58	-310	-167	-196	-318	-407	-80	-38	-177	-225	-42	-101	-149	-171	-100	-8	-15
27	-20	-17	-9	-62	-180	-259	-82	-5	-7	-11	-44	-72	-134	-65	-244	-399	-84	-12	-19	-50	-29	-58	-10	-8	-75
28	-5	-3	-3	-11	-3	-2	-1	-2	-7	-5	-10	-29	-8	-5	-6	-11	-30	-36	-28	-39	-11	-4	-2	-1	-11
29	-2	-2	1	-1	-1	-7	-1	-1	-4	-9	-8	-11	-11	-12	-16	-10	-36	-42	-29	-23	-18	-6	-6	-23	-12
30	-98	-118	-105	-112	-81	-90	-73	-73	-131	-160	-175	-193	-163	-173	-198	-209	-188	-154	-128	-108	-112	-118	-92	-92	-131
MEAN	-8	-7	-7	-9	-8	-6	-7	-7	-10	-16	-23	-63	-27	-20	-18	-20	-33	-31	-24	-35	-39	-17	-16	-21	-29
SD MEAN	-206	-364	-298	-324	-178	-160	-190	-205	-412	-515	-543	-649	-335	-442	-577	-651	-388	-293	-214	-250	-273	-228	-199	-219	-324

VALUES ARE EXPRESSED IN GANNAS

AL INDICES

DECEMBER 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
Q 1	-4	-2	0	-4	-3	-3	-1	-1	-4	-3	-4	-12	-12	-17	-16	-19	-31	-20	-7	-3	-5	-7	-9	-9	-9
Q 2	-6	-6	-3	-3	-6	-9	0	0	1	-4	-6	-12	-12	-10	-15	-37	-41	-69	-91	-162	-100	-18	-9	-8	-26
Q 3	-33	-13	-131	-17	-6	-11	-28	-93	-210	-96	-30	-5	-5	-6	-10	-10	-11	-89	-20	-9	-8	-41	-73	-28	-46
Q 4	-7	-2	-1	-3	-1	0	-2	-36	-58	-14	-8	-7	-82	-102	-9	-15	-14	-16	-15	-17	-139	-372	-207	-144	-52
Q 5	-117	-112	-168	-156	-130	-193	-112	-68	-166	-218	-52	-56	-56	-159	-109	-289	-93	-26	-15	-13	-7	-7	-9	-11	-100
Q 6	-9	-45	-90	-51	-18	-44	-90	-111	-277	-221	-24	-76	-45	-332	-405	-319	-340	-286	-155	-124	-79	-36	-18	-13	-141
Q 7	-16	-7	-5	-19	-75	-53	-131	-63	-46	-58	-77	-130	-369	-217	-199	-156	-122	-121	-95	-190	-173	-76	-229	-237	-126
Q 8	-256	-330	-255	-425	-303	-141	-151	-359	-204	-106	-456	-299	-367	-555	-442	-51	-20	-76	-66	-302	-112	-66	-108	-17	-236
Q 9	-37	-71	-65	-17	-44	-97	-14	-30	-31	-26	-133	-117	-19	-60	-86	-71	-81	-110	-42	-6	-8	-5	-5	-5	-53
Q 10	-10	-7	-1	-1	-3	-1	-4	-2	-12	-152	-72	-76	-197	-206	-133	-95	-101	-53	-86	-152	-71	-33	-9	-9	-65
Q 11	-11	-7	-5	-15	-3	-20	-13	-23	-47	-56	-14	-10	-17	-7	-16	-11	-13	-14	-77	-14	1	0	-2	-5	-19
Q 12	-3	-6	-57	-25	-20	-10	-19	-18	-23	-115	-81	-121	-167	-126	-107	-44	-28	-25	-78	-59	-16	-43	-102	-43	-55
Q 13	-15	-2	-6	-7	-3	-2	-3	-2	-5	-11	-8	-7	-7	-7	-3	-4	-8	-134	-14	-16	4	-6	-77	-135	-25
Q 14	-16	-77	-102	-0	-12	-614	-749	-105	-798	-258	-342	-231	-166	-110	-105	-106	-53	-98	-599	-376	-223	-286	-43	-198	-295
Q 15	-88	-203	-356	-143	-100	-199	-319	-421	-337	-330	-296	-241	-100	-209	-173	-330	-242	-149	-17	-56	-56	-14	-48	-71	-198
Q 16	-49	-46	-17	-21	-20	-17	-26	-16	-14	-17	-19	-48	-28	-18	-41	-31	-45	-87	-65	-76	-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
Q 18	-8	-7	-7	-9	-14	-27	-67	-50	-47	-24	-12	-16	-27	-76	-31	-24	-37	-51	-16	-10	-18	-6	8	-4	-25
Q 19	-34	-13	-26	-38	-11	-18	-82	-92	-209	-311	-72	-15	-15	-20	-16	-18	-6	-11	-36	-90	-80	-87	-304	-114	-71
Q 20	-27	-41	-57	-34	-93	-133	-106	-263	-429	-373	-263	-154	-102	-154	-175	-76	-51	-43	-54	-162	-151	-75	-64	-44	-133
Q 21	-92	-97	-66	-45	-62	-77	-128	-150	-112	-112	-96	-79	-136	-49	-18	-15	-20	-24	-20	-27	-78	-168	-119	-68	-78
Q 22	-79	-130	-83	-68	-67	-96	-57	-50	-151	-91	-71	-45	-64	-103	-82	-100	-115	-69	-56	-47	-61	-108	-116	-28	-79
Q 23	-16	-20	-107	-77	-35	-16	-10	-2	-6	-7	-48	-160	-102	-93	-104	-124	-124	-14	-19	-2	-5	-13	-13	-90	-50
Q 24	-323	-304	-290	-273	-108	-60	-52	-16	-29	-6	-4	-15	-39	-78	-200	-120	-7	-14	-22	-80	-109	-51	-25	-31	-55
Q 25	-53	-12	-8	-11	-11	-9	-10	-12	-13	-11	-13	-12	-12	-14	-61	-87	-162	-116	-64	-44	-142	-21	-16	-72	-59
Q 26	-8	-5	-9	-9	-3	-113	-56	-35	-61	-21	-6	-3	-5	-29	-37	-60	-92	-31	-9	-10	-9	-68	-30	-12	-20
Q 27	-2	-4	-9	-32	-6	0	-7	-9	-15	-41	-52	-11	-2	-226	-92	-24	-194	-150	-90	-104	-146	-361	-227	-161	-92
Q 28	-158	-171	-90	-146	-25	-12	-52	-32	-25	-162	-68	-46	-310	-210	-140	-205	-442	-388	-43	-44	-331	-276	-252	-380	-137
Q 29	-82	-13	-36	-69	-80	-91	-64	-49	-122	-22	-10	-14	-6	-71	-83	-91	-144	-108	-194	-73	-11	-26	-138	-412	-55
Q 30	-292	-186	-263	-274	-137	-18	-2	-8	-13	-24	-7	-6	-8	-10	-15	-62	-451	-276	-15	-3	-9	-23	-8	-6	-18
Q 31	-0	-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	-70	-84	-109	-100	-92	-184	-83	-94	-66	-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	-369	-279	-173	-232	-166	-202	-242	-214	-158	-183	-144	-297	-283	-166	-145	-169	-123	-204

JANUARY 1970		AU INDICES										VALUES ARE EXPRESSED IN GANNAS										MEAN		
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
D	26	23	31	34	36	32	42	42	36	25	35	49	72	83	37	96	133	51	49	39	40	45	68	40
Q	70	68	87	103	265	181	122	117	193	175	82	101	64	143	109	168	162	148	94	122	51	56	65	104
Q	85	87	86	78	42	69	50	55	53	66	46	34	42	35	15	9	4	8	9	7	12	18	13	41
Q	15	15	15	19	24	20	21	21	33	33	42	40	17	22	17	14	20	34	34	21	18	19	14	13
Q	29	33	36	29	31	22	40	32	41	34	73	124	99	67	69	56	71	56	33	32	27	24	40	56
Q	75	33	20	23	46	23	20	19	42	31	24	30	29	54	23	25	22	14	12	13	26	34	24	19
Q	28	24	30	28	39	34	40	51	53	29	19	17	19	24	18	9	15	42	154	172	103	67	41	38
Q	42	49	43	39	32	40	45	40	51	67	57	100	56	66	61	80	75	54	47	34	35	28	32	42
Q	57	85	123	78	59	83	85	57	68	157	67	49	49	25	32	36	20	47	26	11	21	30	24	36
Q	53	57	56	63	42	26	22	21	31	28	19	37	29	34	43	12	24	10	12	12	13	8	11	13
Q	26	38	61	63	38	40	57	36	26	26	21	28	27	25	54	21	11	9	14	18	9	19	70	59
Q	77	77	76	45	45	32	51	34	37	44	53	41	28	14	45	36	36	57	35	32	54	92	102	96
Q	56	49	25	17	35	42	31	30	29	25	29	29	17	37	98	98	67	29	13	15	21	27	35	35
Q	32	25	31	29	61	62	52	58	58	56	60	55	47	43	58	35	24	17	19	12	17	17	33	73
Q	115	105	101	81	103	111	48	41	39	25	21	27	29	21	21	19	18	25	26	19	19	29	64	87
Q	94	71	131	113	92	128	154	109	155	165	163	202	200	108	167	184	209	240	178	135	114	112	125	95
Q	144	131	117	147	162	167	151	61	83	78	70	35	46	21	18	30	47	21	21	35	32	23	21	17
Q	17	17	36	43	40	36	62	43	106	62	36	49	31	30	19	27	56	40	34	15	13	14	14	15
Q	23	23	25	27	20	20	14	20	24	21	58	46	22	25	34	56	10	7	6	16	25	39	103	73
Q	52	65	48	32	25	14	14	23	31	52	47	49	52	106	89	37	26	20	17	81	70	74	50	33
Q	42	32	31	54	42	39	36	26	31	43	49	37	36	99	63	31	17	12	18	20	18	29	25	32
Q	22	34	36	31	24	30	29	28	19	31	30	37	37	26	19	16	1	10	9	15	21	23	27	24
Q	21	18	20	36	42	36	34	39	70	43	33	44	32	36	20	18	13	14	13	12	11	19	28	19
Q	10	31	18	24	17	18	53	26	76	75	83	131	79	80	22	20	54	15	19	27	43	50	73	69
Q	28	27	31	24	29	37	42	27	27	17	19	17	15	21	26	11	11	7	6	14	13	11	10	12
Q	18	15	19	24	26	25	22	25	32	39	39	24	46	17	9	18	9	6	10	8	15	19	12	12
Q	12	20	25	12	35	43	20	33	41	74	55	60	75	57	66	50	56	27	40	84	130	110	62	44
Q	62	55	28	22	25	27	26	28	28	32	40	42	32	25	32	30	32	32	48	70	36	27	28	44
Q	41	25	29	30	49	42	72	72	104	62	24	22	23	25	25	20	20	20	24	26	27	23	25	37
Q	55	31	16	30	53	81	151	97	63	42	71	45	41	41	32	37	60	35	116	91	94	109	65	61
Q	70	115	88	50	42	35	30	30	29	27	29	26	21	23	23	20	20	20	27	23	30	33	26	24
MEAN	40	49	49	45	53	51	53	45	54	53	50	51	44	46	46	40	42	39	38	40	37	39	43	44
SD MEAN	27	29	30	31	30	33	35	28	29	28	30	28	24	24	40	23	24	17	16	14	15	19	26	26
SD MEAN	84	77	95	94	122	126	133	88	112	123	99	86	80	68	72	95	100	98	87	79	63	66	64	63

FEBRUARY 1970			AU INDICES										VALUES ARE EXPRESSED IN GAMMAS												MEAN		
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			
1	26	42	38	37	74	51	31	16	13	12	12	10	14	22	19	16	13	15	16	23	36	58	192	129	35		
2	148	70	60	62	135	103	125	94	85	61	81	81	86	75	34	40	50	82	110	135	82	157	114	120	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		
4	13	31	19	29	20	23	37	58	85	87	102	77	94	90	132	97	93	129	180	64	77	64	87	80	78		
5	65	58	53	74	89	79	53	38	39	33	27	34	34	52	65	51	34	20	21	22	32	41	44	41	47		
6	61	55	41	37	93	50	31	45	55	74	24	15	11	9	12	12	11	13	16	4	9	12	10	10	28		
7	11	11	12	11	9	11	10	14	15	20	18	18	7	10	13	6	4	3	7	9	7	12	15	6	11		
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	55	48	35	29	27	29	22	20	19	27		
10	20	17	15	19	22	18	26	30	33	15	12	11	10	14	32	69	100	181	185	36	42	31	34	31	40		
11	28	17	14	14	18	26	27	31	32	24	15	9	10	9	10	25	30	28	12	12	10	19	18	16	13		
12	15	23	17	15	15	12	12	13	11	17	14	13	12	13	11	14	16	19	21	16	16	13	12	12	15		
13	12	14	15	22	26	15	30	26	23	21	16	28	39	42	66	32	28	17	24	18	16	16	16	16	24		
14	22	26	24	31	66	86	37	14	6	32	69	125	39	42	40	48	73	56	33	29	30	30	25	26	42		
15	28	32	28	14	28	40	44	105	66	66	92	70	33	23	22	35	25	31	34	34	30	36	36	36	41		
16	32	29	24	26	22	23	17	42	34	31	36	39	38	46	116	60	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	130	75	48	83	51		
18	39	33	46	38	62	31	40	50	83	57	51	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	19	13	9	13	17	15	21		
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		
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	16	17		
24	17	18	15	18	18	16	15	32	40	28	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	15	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	185	38	17	5	2	0	18	3	7	89		
27	6	2	0	2	8	4	41	77	68	89	82	123	54	79	51	29	36	51	15	36	74	106	139	148	55		
28	66	59	106	66	49	68	59	116	203	101	104	207	200	175	84	67	107	137	153	63	35	70	52	107	106		
MEAN	32	26	27	25	34	34	32	42	42	39	46	50	45	44	46	41	42	46	45	35	32	34	35	39	38		
50 MEAN	15	13	11	13	14	18	16	20	20	19	15	12	12	14	13	15	15	15	10	13	13	13	14	14	13		
50 MEAN	53	41	45	40	56	60	55	63	85	68	74	101	101	82	67	61	118	124	112	76	61	99	68	71	72		

VALUES ARE EXPRESSED IN GANNAS

MARCH		1970			AU INDICES				VALUES ARE EXPRESSED IN GANNAS																MEAN	
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	
1		99	119	90	70	78	162	217	247	217	210	149	200	156	201	364	244	96	74	37	43	62	80	73	117	141
2		94	47	35	111	74	105	82	94	89	99	138	112	62	34	34	44	61	44	39	27	38	30	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	53
4		72	57	83	103	57	82	164	87	97	118	107	197	142	103	210	169	277	220	293	203	184	133	106	167	141
5		62	78	61	52	47	40	50	79	107	65	35	21	20	22	52	60	73	197	262	243	164	165	109	158	94
6		56	62	113	89	42	30	29	41	89	85	152	97	59	46	53	79	205	272	253	228	261	220	78	137	116
7		147	90	157	84	86	61	53	93	159	143	149	137	107	120	230	360	131	281	275	198	124	101	139	158	154
8		211	205	229	298	436	437	264	306	295	232	189	300	217	372	118	118	377	555	415	126	23	121	46	186	225
9		140	115	224	128	82	96	131	124	131	129	104	98	43	81	99	96	206	210	119	99	66	30	78	45	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	18	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	13	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	20	36	27	13	11	5	37
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	29	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
21		58	94	83	82	47	30	22	11	23	30	18	17	15	24	33	55	24	38	37	45	43	14	16	16	36
22		17	21	22	16	14	15	11	29	26	35	51	82	77	46	31	12	14	19	19	20	23	20	20	18	28
23		20	29	24	25	23	24	23	44	53	70	35	33	31	27	29	29	22	20	52	30	29	26	24	24	31
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
25		26	22	25	31	19	14	26	59	44	24	16	22	24	25	22	23	21	23	23	22	20	22	20	22	25
26		20	19	28	31	29	34	18	34	40	22	20	37	30	22	31	35	28	48	32	35	45	34	31	26	31
27		21	18	14	12	11	15	22	46	78	103	17	226	129	63	31	34	41	46	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	157	239	150	141	112	106	138	151
30		210	77	44	19	18	144	92	97	101	108	163	249	255	134	46	81	177	70	80	68	141	84	70	34	187
31		24	50	41	96	53	161	234	246	257	180	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	70	83	100	75	68	79	79	82	99	98	65	75	70	66	64	72
50 MEAN		26	34	32	31	23	18	18	26	28	26	28	32	34	30	28	25	18	23	23	25	25	19	19	19	25
100 MEAN		116	104	153	139	140	157	142	162	166	155	154	193	135	152	189	197	227	267	234	48	103	107	98	114	154

APRIL			1970										AU INDICES						VALUES ARE EXPRESSED IN GAMMAS										MEAN			
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						
1	42	25	7	0	-4	1	-2	-6	-5	-7	-5	1	-5	1	12	4	4	0	2	5	1	1	2	4	20	18	5					
2	10	7	5	3	1	-1	10	14	19	10	15	13	10	15	36	56	66	40	16	19	47	19	21	36	29	22	21					
3	31	41	55	72	150	138	216	163	123	108	162	94	120	129	47	58	60	58	60	49	45	40	27	26	28	36	86					
4	17	29	18	19	21	19	42	69	91	77	60	107	70	62	34	42	34	26	23	36	20	22	16	18	23	19	38					
5	22	21	16	13	13	17	22	40	63	108	120	133	81	54	32	54	32	6	47	76	47	51	50	46	45	51	49					
6	47	46	44	137	124	134	222	153	130	161	191	314	208	86	119	138	86	138	150	88	59	61	52	94	63	50	128					
7	40	57	39	42	37	71	90	93	172	64	20	54	28	27	12	28	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	30	43	46	24	31	27	27	29	44	71	72	60					
9	44	35	37	49	01	45	124	101	294	153	124	191	184	250	69	36	35	36	35	36	31	36	36	109	85	67	94					
10	51	33	36	23	16	15	19	21	28	27	22	20	20	30	31	20	31	26	35	31	30	27	27	49	74	93	33					
11	98	42	72	70	54	42	74	91	140	158	118	136	75	63	60	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	93	111	93	129	74	60	48	46	36	41	69					
13	20	24	18	12	15	12	20	36	29	34	28	89	69	67	54	29	31	29	31	45	22	10	22	29	32	33	33					
14	34	38	31	23	16	10	13	23	23	24	20	44	47	21	26	24	18	24	18	26	27	10	23	30	46	32	26					
15	39	30	31	25	22	16	17	34	46	46	64	33	27	40	39	63	107	63	107	207	232	168	153	98	108	155	75					
16	69	106	113	152	130	127	132	127	91	37	28	20	16	15	16	16	15	24	27	35	55	176	343	391	353	286	116					
17	113	179	150	183	174	137	85	46	140	160	132	87	75	173	183	93	85	93	85	161	215	167	256	87	89	58	135					
18	61	49	29	16	14	12	11	14	112	156	140	201	256	267	104	51	867	51	867	71	96	87	68	136	198	282	109					
19	130	109	119	160	232	214	180	152	234	287	257	178	165	67	42	63	70	63	70	67	93	71	61	60	31	37	129					
20	25	28	43	135	157	110	51	27	32	49	103	114	159	195	85	160	259	160	259	413	178	164	115	83	135	108	120					
21	52	45	41	70	255	251	259	242	240	144	157	343	368	259	265	147	218	147	218	110	184	115	13	82	104	171	165					
22	253	136	115	166	254	324	234	105	129	98	75	68	85	87	79	35	43	35	43	38	36	24	22	22	21	36	184					
23	58	39	62	63	93	126	149	141	99	170	197	257	167	107	126	169	236	169	236	249	224	239	230	199	182	179	157					
24	177	141	135	176	105	177	199	192	173	158	209	253	169	193	161	158	148	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	113	51	26	74	179	169	114	188	87	138					
26	151	169	109	66	43	43	20	19	20	24	35	60	119	126	112	36	58	36	58	121	179	217	261	263	261	190	112					
27	188	117	95	70	93	166	224	82	23	28	79	104	84	100	83	54	92	54	92	76	111	89	71	49	43	40	87					
28	73	54	78	82	98	92	93	100	104	85	108	104	94	56	32	83	22	83	22	31	46	41	49	85	52	44	88					
29	43	63	50	69	73	85	85	60	116	110	110	119	144	151	86	77	131	131	131	189	261	212	166	158	134	88	116					
30	85	84	161	177	219	159	96	156	224	197	270	174	79	96	190	351	303	351	303	190	431	85	101	103	171	170	166					
MEAN	74	67	61	75	94	93	102	91	110	106	109	119	108	100	79	72	86	72	86	96	94	88	88	67	90	83	90					
50 MEAN	45	36	39	33	33	29	32	43	46	43	46	58	51	43	36	32	43	32	43	68	71	54	55	54	62	69	47					
50 MEAN	98	87	79	130	193	191	170	115	134	124	132	185	185	160	146	111	151	111	151	164	118	94	92	74	82	85	138					

		VALUES ARE EXPRESSED IN GANNAS																							
		AU INDICES																							
MAY	1970	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
UT																									MEAN
1	104	69	42	52	54	170	139	69	84	24	33	43	90	137	86	82	56	41	99	169	154	276	128	120	96
2	128	58	41	74	125	35	89	102	84	65	49	40	63	43	31	34	83	70	149	109	1	65	80	77	73
3	49	43	28	17	14	7	4	29	22	34	65	147	128	94	110	53	69	104	105	75	137	164	184	99	76
4	55	46	29	24	27	15	35	63	93	142	116	69	60	56	70	68	111	159	92	62	7	55	48	68	68
5	57	56	47	42	37	23	38	47	51	100	317	296	115	81	91	98	131	99	106	79	81	68	79	151	97
6	44	25	15	11	12	10	9	21	33	99	55	79	70	63	50	41	113	113	70	62	55	42	40	38	47
7	31	29	26	53	21	17	16	19	28	40	195	91	65	60	30	19	23	71	69	82	69	44	34	25	45
8	27	22	17	17	22	10	19	24	36	50	35	38	36	44	36	34	86	72	97	131	103	62	85	99	51
9	55	56	57	44	79	60	71	88	69	48	47	65	44	61	54	47	58	31	42	63	55	35	26	26	53
10	34	33	25	28	46	57	48	55	89	85	71	45	38	26	23	12	10	14	23	26	27	27	27	28	30
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	42
12	96	127	46	139	89	37	35	90	79	140	243	230	211	162	109	148	267	350	192	166	256	435	259	159	170
13	85	76	131	192	259	174	104	29	27	37	30	42	52	62	83	32	33	21	38	59	54	64	93	131	88
14	105	66	61	89	177	179	213	194	202	105	55	35	51	59	47	86	193	306	351	367	351	207	196	179	162
15	157	166	60	28	103	122	65	110	189	326	203	80	54	30	29	37	30	86	65	64	63	57	73	95	95
16	60	65	67	67	73	111	93	82	181	62	52	64	74	45	93	79	92	110	128	123	161	124	101	104	93
17	72	78	82	46	263	214	144	56	39	47	95	174	160	140	62	70	34	77	68	63	47	70	90	125	99
18	99	82	82	22	32	26	36	56	43	35	34	41	83	89	80	72	72	60	57	48	43	36	32	32	94
19	33	38	50	44	44	28	133	115	182	234	236	194	187	90	70	58	65	101	113	141	135	130	102	82	105
20	72	64	45	141	218	257	159	85	120	195	177	193	189	201	194	200	170	181	208	154	197	142	127	191	162
21	146	72	52	32	11	15	9	52	77	182	172	192	152	171	121	110	81	78	136	117	141	46	57	85	96
22	83	133	106	69	58	84	138	166	75	73	99	163	193	152	176	124	120	247	257	177	140	106	81	59	128
23	46	25	42	41	26	15	15	93	119	84	141	139	86	54	33	26	36	76	129	124	162	159	214	244	39
24	231	167	80	63	35	20	13	37	78	182	157	193	97	117	119	73	36	81	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	58	114
Q	43	36	21	13	7	11	13	15	19	23	21	28	24	26	34	36	33	34	55	67	55	83	134	58	35
Q	98	59	50	43	42	65	201	192	212	169	95	141	196	209	130	183	238	323	364	244	343	366	284	131	179
Q	222	256	77	78	69	51	35	36	103	293	166	309	295	673	646	417	360	169	115	154	143	115	105	167	216
Q	133	106	54	48	163	211	246	254	214	172	132	76	82	97	36	43	55	66	59	189	210	115	61	89	118
Q	131	44	42	76	44	91	33	118	209	246	305	118	50	47	35	139	128	272	141	122	51	48	43	48	108
31	27	26	27	27	15	3	56	49	94	173	116	74	228	132	151	162	193	94	44	35	30	32	36	26	70
MEAN	89	78	53	58	76	75	78	76	92	112	115	116	109	109	97	86	103	118	115	110	113	113	99	99	95
50 MEAN	37	34	27	23	33	33	35	43	50	69	43	44	37	37	35	31	42	35	51	67	60	62	68	78	44
50 MEAN	124	122	54	89	116	124	135	131	146	194	167	190	215	260	223	194	216	288	168	169	238	239	151	147	169

VALUES ARE EXPRESSED IN GANNAS

AU INDICES

JUNE

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MEAN

0	1	39	62	93	319	204	43	39	89	172	183	132	163	108	263	325	307	309	336	233	174	113	126	114	81	171
2	51	40	119	103	93	61	36	29	32	43	69	67	79	64	80	101	119	99	111	103	112	84	72	102	76	
3	71	94	57	80	218	189	127	124	243	231	216	185	135	36	180	145	99	118	172	192	134	134	91	170	145	
4	117	83	89	61	64	11	58	96	175	197	168	90	112	118	133	152	124	95	68	92	81	70	148	141	107	
5	22	17	55	36	53	84	142	158	145	124	146	138	40	24	23	20	22	54	31	30	31	26	18	12	61	
Q	6	10	12	16	29	15	12	19	57	61	114	99	53	43	52	31	16	14	24	32	40	36	35	24	12	35
7	13	13	16	22	13	14	16	36	49	65	92	52	43	44	58	73	74	94	111	154	271	233	249	226	84	
8	236	195	134	68	155	236	216	80	44	48	137	99	111	40	87	24	44	77	90	101	80	101	124	94	187	
9	91	30	50	34	88	21	21	34	33	23	16	15	18	21	33	33	56	68	121	217	157	157	145	103	52	
10	100	68	51	41	36	34	23	95	122	79	130	59	23	72	69	74	138	295	246	223	182	95	54	53	99	
Q	11	79	77	70	54	26	22	27	21	27	30	29	37	28	24	21	61	71	155	129	89	47	20	20	38	50
12	66	84	68	61	48	21	12	28	57	99	84	128	88	119	77	47	53	86	118	151	68	89	105	91	77	
13	109	93	72	66	48	34	97	168	106	244	326	248	278	443	194	150	71	128	157	114	157	120	96	97	189	
14	182	153	131	174	68	37	16	11	11	26	33	49	45	42	32	33	27	36	119	237	149	80	74	150	80	
15	172	139	147	67	44	101	90	216	210	231	305	276	165	123	123	158	177	191	148	166	196	182	161	195	166	
16	193	135	103	54	152	129	21	18	29	30	34	35	85	64	97	58	59	18	38	74	110	97	106	107	78	
17	49	27	24	23	22	19	14	32	54	61	75	49	177	128	98	47	139	243	315	339	312	221	169	252	122	
18	196	64	89	47	30	50	37	186	235	293	296	267	497	397	429	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	140	140	123	233	253	268	105	
20	218	154	153	207	214	270	226	215	220	265	314	338	227	259	310	388	410	333	289	386	394	323	240	153	272	
Q	21	148	90	141	133	105	154	214	230	228	169	246	263	152	173	142	196	228	270	154	33	32	84	68	51	154
22	83	68	46	29	15	7	4	2	11	23	63	64	81	52	37	46	38	33	94	121	142	125	93	78	56	
23	104	66	43	43	47	34	21	12	13	12	16	53	53	50	41	15	24	33	30	36	33	60	29	30	37	
24	63	90	44	24	28	28	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	282	210	177	144	138	112	89	58	75	54	43	38	112	124	106	97	
Q	26	50	40	45	134	300	318	347	341	263	153	195	94	78	49	90	296	459	359	357	348	274	168	103	58	203
27	65	74	92	173	182	111	141	257	466	324	282	228	447	325	165	122	111	150	91	41	96	76	57	37	171	
28	48	95	12	19	45	96	46	32	42	190	197	166	164	123	101	82	27	32	33	35	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	280	121	82	99	
30	53	37	23	19	24	22	30	163	223	271	249	129	58	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	
50 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	
50 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	

VALUES ARE EXPRESSED IN GAMMAS

AU INDICES

1970

JULY

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	11	79	74	114	87	146	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	136	246	323	91	98	40	91	71	64	41	22	23	43	26	74	91
3	126	109	123	57	143	246	232	321	259	220	344	190	134	82	36	40	29	24	31	34	113	194	225	90	142
4	168	200	112	51	137	285	232	196	262	173	110	74	104	43	26	34	37	37	34	27	20	21	18	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	150	166	142	91	182	121	149	223	209	212	161	167	164	169	69	58	54	50	33	26	25	24	28	21	114
7	23	24	21	13	4	4	15	25	47	78	61	15	67	38	25	27	33	38	45	79	151	133	182	220	59
8	150	135	154	271	329	326	319	183	99	54	48	49	127	135	123	115	170	214	256	267	263	275	251	241	190
9	205	207	119	436	346	309	278	144	221	206	282	237	270	590	662	501	262	203	287	310	325	334	223	204	389
10	214	167	97	60	37	33	55	35	16	21	61	119	178	145	136	128	168	240	150	207	294	210	195	129	131
11	64	45	57	33	22	45	109	101	98	129	119	106	113	116	93	74	130	174	105	144	158	133	125	198	104
12	179	164	222	282	138	60	108	128	149	204	127	106	123	107	162	156	102	69	132	170	197	93	146	182	139
13	158	129	136	158	102	120	94	31	15	13	65	81	80	52	37	80	126	227	152	104	143	114	110	55	98
14	65	68	59	103	51	20	24	63	152	75	82	83	51	64	55	59	25	64	154	157	91	60	84	119	77
15	113	46	49	47	40	16	18	37	82	146	137	102	69	115	84	79	85	88	71	55	31	32	50	68	69
16	100	104	78	93	40	42	17	11	14	20	22	93	143	86	62	24	54	103	122	64	59	20	20	22	60
17	14	45	63	32	13	15	19	26	19	19	24	35	65	88	92	88	130	148	121	110	122	217	321	214	85
18	75	54	58	61	136	77	24	15	19	55	79	66	65	56	42	42	21	32	41	73	81	100	102	46	59
19	37	30	47	67	89	60	67	41	43	92	174	134	38	23	32	60	68	149	92	50	80	148	157	215	83
20	177	67	49	44	31	59	70	51	50	46	32	32	35	42	35	29	31	46	75	115	170	118	177	239	77
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	181	148	124	177	125	116	129	120	68	70	74	52	149	220	193	77	32	37	35	103
24	78	146	220	251	262	229	213	166	42	25	26	85	168	171	208	259	176	240	275	172	69	110	198	225	186
25	446	246	443	551	185	387	192	81	173	262	332	407	208	268	126	69	100	74	70	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	161	102	49	120	154	200	176	142	133	161	155	59	85	121	112
28	66	42	17	12	5	-1	6	17	95	54	32	38	24	22	16	27	26	35	24	37	43	25	81	75	32
29	140	81	67	161	267	200	298	330	318	163	338	292	358	411	190	353	300	180	283	187	86	66	33	30	214
30	20	21	20	28	85	139	44	35	29	13	38	86	87	63	82	46	33	36	61	91	85	118	202	171	58
31	155	137	76	148	176	142	96	145	253	215	176	191	116	91	100	155	209	270	260	162	11	154	228	164	165
MEAN	120	110	101	123	121	119	124	110	126	119	130	129	118	125	116	107	104	122	129	118	118	123	136	132	120
50 MEAN	62	39	78	40	55	31	26	27	49	85	97	69	49	51	40	45	51	68	95	59	77	80	110	125	60
50 MEAN	260	182	165	287	196	180	176	127	175	176	2	259	244	333	307	243	188	166	210	205	200	220	153	168	211

VALUES ARE EXPRESSED IN GAMMAS

AU INDICES

AUGUST 1973

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	82	26	18	15	19	46	29	35	32	37	53	40	69	50
Q 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	50
Q 3	40	30	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	46	60	90	95	60	46	36	47
Q 5	32	26	60	61	72	65	35	15	16	17	22	25	24	31	34	31	22	25	27	29	31	33	33	35	33
Q 6	38	25	21	19	19	18	24	35	75	129	67	36	25	31	29	39	59	50	53	73	102	105	108	238	61
Q 7	174	133	45	34	28	27	50	83	72	48	64	42	30	47	67	77	65	33	73	67	83	259	149	177	82
Q 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
Q 9	206	194	196	115	148	123	102	117	64	39	187	143	103	93	30	35	52	144	147	92	58	57	35	28	105
Q 10	25	53	41	48	39	38	73	95	126	107	86	143	91	73	42	47	45	43	59	44	39	78	62	64	63
Q 11	74	40	49	57	66	34	63	80	135	195	79	90	55	92	85	70	38	41	60	68	62	38	141	214	88
Q 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	100
Q 13	39	30	44	15	20	129	89	78	79	127	137	80	81	98	88	71	67	79	196	206	223	241	183	80	103
Q 14	61	77	78	92	95	31	26	23	37	41	20	29	15	14	14	27	47	34	42	25	26	53	67	94	45
Q 15	91	102	92	97	60	66	48	57	73	120	125	141	109	58	27	18	17	27	46	82	52	95	126	209	79
Q 16	150	147	99	71	82	165	94	133	132	123	142	170	195	148	101	79	85	106	146	107	54	85	379	330	139
Q 17	249	342	358	391	208	547	264	465	607	361	214	203	488	468	398	235	242	305	372	328	162	126	159	71	316
Q 18	113	219	165	155	125	131	167	186	187	183	160	217	236	305	359	308	321	410	354	179	131	103	127	75	209
Q 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
Q 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
Q 21	62	50	31	43	46	33	20	35	18	47	93	93	62	40	29	56	80	36	32	39	34	47	47	29	45
Q 22	13	10	11	15	41	35	20	36	68	97	90	130	45	90	103	128	101	146	166	95	30	27	44	63	70
Q 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	36	20	11	6	8	14	22	36	62	67	40	35	39	52	50	51	44	63	45	39	34
Q 25	40	34	53	46	59	86	154	224	216	136	195	162	193	182	166	166	137	113	65	96	152	119	104	76	125
Q 26	93	80	64	113	206	212	216	226	219	247	250	189	353	222	230	294	238	154	127	80	119	134	82	136	178
Q 27	110	75	186	40	162	280	138	68	47	46	40	66	97	107	167	261	236	271	230	109	140	163	185	65	138
Q 28	45	33	18	10	44	123	24	22	58	26	15	14	32	46	114	118	179	167	157	120	203	173	169	78	87
Q 29	56	31	120	202	232	192	148	138	187	135	74	112	115	78	61	126	79	22	34	62	47	29	35	13	97
Q 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
Q 31	23	28	13	22	58	119	151	185	189	165	141	86	110	102	98	149	234	307	333	221	179	71	65	31	132
MEAN	87	79	81	80	81	93	79	99	121	110	99	98	106	94	89	90	92	103	108	96	86	90	96	88	94
50 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
90 MEAN	107	101	198	165	149	213	181	231	256	189	197	201	277	232	220	185	181	225	235	170	111	111	116	101	160

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	
Q	1	37	34	22	17	30	27	107	188	218	207	292	226	97	80	179	189	197	270	239	163	251	133	107	142	
	2	91	111	83	54	87	87	94	39	139	217	172	95	107	99	99	125	187	128	98	192	71	37	50	181	
	3	60	31	49	126	91	51	43	112	133	164	208	244	173	96	88	156	94	79	78	94	91	101	203	111	
	4	124	97	61	45	36	35	184	72	62	35	49	112	79	29	47	111	125	67	79	54	92	81	93	73	
	5	57	34	49	54	53	49	42	43	45	43	41	36	49	57	55	139	149	94	110	87	59	103	138	69	
Q	6	68	35	24	53	45	38	30	23	40	47	23	23	27	36	64	63	44	73	124	79	71	65	75	50	
	7	48	44	43	22	18	22	17	46	51	32	52	49	64	85	46	29	34	28	38	74	117	118	74	49	
	8	39	29	26	33	51	41	104	67	101	70	65	42	169	157	247	219	180	70	219	180	70	39	41	35	
Q	9	30	32	31	26	77	84	65	58	65	39	29	27	20	21	20	46	45	33	52	88	136	143	171	63	
	10	112	131	111	153	91	86	35	37	43	21	21	23	32	41	27	17	23	16	13	14	16	10	21	46	
Q	11	25	25	13	13	9	11	17	20	23	22	22	21	23	22	19	14	16	20	19	23	24	26	29	27	
Q	12	27	32	43	40	44	51	58	120	95	37	27	16	18	19	16	18	31	29	27	31	35	38	58	30	
Q	13	28	26	38	47	83	114	185	214	265	269	319	321	187	215	105	59	218	130	71	186	244	295	161	151	
Q	14	78	136	87	36	48	49	57	65	91	110	99	279	185	189	286	253	174	117	102	138	173	131	73	129	
	15	75	87	106	189	221	127	134	37	38	38	92	100	155	47	33	36	24	62	85	77	60	94	57	85	
	16	43	40	44	51	90	112	126	73	127	71	65	86	50	74	27	15	21	41	61	51	63	42	40	27	
	17	27	38	51	58	72	121	133	142	89	62	30	23	41	32	47	42	67	100	76	48	38	75	63	84	
	18	43	55	55	106	92	89	110	113	107	106	82	29	27	54	73	64	39	99	78	70	46	84	85	95	
	19	39	40	36	70	98	207	176	93	123	152	206	117	93	133	155	184	153	170	223	249	276	170	113	48	
	20	72	84	64	29	55	123	83	120	141	147	141	106	175	116	154	143	183	135	90	112	98	70	95	117	
Q	21	160	140	116	116	149	169	166	147	215	184	88	128	237	189	223	170	142	178	185	135	74	110	72	61	
	22	51	54	92	52	108	67	36	32	65	126	129	67	68	37	47	59	62	115	114	55	35	36	56	56	
	23	56	98	45	33	20	27	74	84	139	137	198	115	103	88	61	40	39	43	28	37	44	61	52	30	
	24	76	68	63	62	32	111	164	115	165	110	42	17	22	63	45	27	32	43	70	113	53	61	60	43	
	25	45	40	34	42	122	92	110	110	125	100	45	19	20	31	81	57	38	57	119	53	43	34	30	31	
	26	30	30	38	52	61	62	78	41	47	62	49	52	51	33	26	41	40	36	37	30	34	52	66	86	
Q	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	
	28	128	100	68	38	27	27	21	21	22	29	42	53	45	40	92	33	26	25	21	25	20	32	28	32	
Q	29	32	34	31	38	41	46	48	61	46	41	24	34	25	23	29	27	29	23	26	26	28	46	65	38	
	30	39	40	37	72	104	80	64	34	46	42	30	47	56	34	36	34	41	50	38	24	37	82	50	53	
MEAN	60	62	59	62	70	75	86	84	97	86	92	92	92	76	70	77	81	89	88	93	88	82	86	79	61	79
5Q MEAN	35	32	30	34	43	45	44	56	54	37	25	25	25	23	24	38	34	33	36	50	49	58	63	74	60	42
50 MEAN	81	94	79	71	81	92	126	160	187	154	180	226	226	161	152	175	168	209	193	168	164	144	179	126	89	142

VALUES ARE EXPRESSED IN GAMMAS

OCTOBER 1970			AU TWOICES										VALUES ARE EXPRESSED IN GAMMAS										MEAN		
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	88	75	92	88	142	158	110	124	132	98	82
4	137	105	96	212	270	133	116	137	98	95	106	114	100	84	67	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	26	52
6	31	52	48	65	64	59	53	63	33	28	57	73	47	53	29	16	13	16	42	44	58	70	8	29	47
7	19	13	15	30	79	16	33	35	26	34	29	20	33	25	24	12	15	12	17	17	20	25	28	31	23
8	30	26	25	46	42	32	19	17	22	26	20	18	14	16	14	9	12	14	31	19	21	16	20	33	23
9	36	31	18	18	23	17	20	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	25	23	28	33	37	69	101	162	224	197	221	209	184	84
11	200	144	103	136	186	237	156	162	207	267	175	86	129	112	154	225	168	167	163	193	97	58	126	127	157
12	65	113	182	176	128	149	108	86	116	155	167	139	112	76	23	20	10	16	19	24	19	16	19	21	82
13	12	20	11	12	19	31	47	44	49	21	27	34	94	64	30	89	51	81	55	65	50	49	49	39	43
14	98	13	22	33	27	44	39	72	67	70	55	73	64	35	15	11	22	32	28	28	49	33	40	26	60
15	58	39	47	29	22	31	54	43	25	27	24	20	29	31	50	26	11	10	14	13	35	37	19	17	30
16	19	16	15	16	16	19	29	15	23	89	154	159	186	212	162	293	255	321	102	125	142	157	177	125	120
17	87	44	30	12	36	54	47	101	135	207	156	126	176	242	251	198	161	164	139	174	158	47	190	185	128
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	82	76	116	81	90	80	104	82	138	124	91	77	59	87	84	67	84	51	69	44	74
20	78	72	58	68	69	67	89	83	113	84	106	91	141	180	69	29	25	23	20	17	16	30	49	26	64
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	62	130	184	139	90	104	184	182	226	101	146	261	384	396	324	209	87	42	86	39	143	192
23	148	144	92	51	72	130	110	89	114	111	102	80	94	82	260	330	306	194	255	221	225	117	154	71	145
24	88	66	61	59	51	102	80	94	157	89	77	131	90	82	75	58	25	13	52	86	62	39	28	18	69
25	26	24	23	16	29	24	45	37	51	60	57	44	41	51	95	34	68	53	31	36	28	31	27	22	40
26	21	24	25	21	25	25	22	20	33	38	56	124	82	97	51	16	28	19	22	16	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	93	62	66	37
28	47	61	61	88	81	69	143	91	56	37	23	27	47	34	60	66	62	11	118	125	123	168	63	86	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	98
30	102	84	73	84	71	47	35	58	35	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	38	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
50 MEAN	37	26	23	28	24	22	27	26	25	30	24	21	24	23	23	14	14	15	22	19	23	25	26	24	24
100 MEAN	180	98	69	80	92	74	74	99	102	125	113	103	107	134	153	191	180	178	130	144	130	92	132	78	115

NOVEMBER 1970			AU INCHES							VALUES ARE EXPRESSED IN GAMMAS																MEAN
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		
Q	1	6	9	15	15	15	14	13	14	24	17	47	62	10	8	6	8	14	8	7	10	12	12	12	15	
	2	16	15	13	11	13	17	21	42	48	37	43	78	41	28	40	31	13	13	11	9	17	16	33	26	
	3	42	67	126	55	30	53	81	51	82	33	13	23	18	40	72	77	170	146	210	140	86	93	68	77	
	4	94	144	91	63	28	20	18	32	72	97	104	99	43	14	24	37	32	28	47	89	97	96	60	80	
	5	66	111	118	79	83	79	113	126	96	70	40	40	28	22	26	31	32	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	41	55	51	104	
	7	65	27	136	297	302	312	305	348	173	263	163	333	169	242	379	131	70	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	19	42	162
	9	16	10	18	14	31	32	49	76	89	64	69	73	45	14	20	32	51	71	66	42	40	24	27	19	42
	10	37	22	22	62	78	64	51	35	22	69	91	99	747	101	89	189	108	49	78	53	69	42	37	61	69
	11	36	57	61	63	64	50	166	119	84	97	117	92	69	65	42	113	153	50	36	32	88	64	60	43	75
	12	38	18	38	17	45	58	46	76	138	75	113	74	47	53	67	53	41	23	19	9	12	6	11	17	43
	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	68
	14	42	28	36	27	31	41	38	90	62	43	29	39	22	19	27	26	52	64	95	80	38	39	17	14	43
	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
Q	16	17	22	24	35	29	25	25	20	27	25	51	39	41	39	39	38	75	130	51	57	69	68	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	29	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	126	206	193	154	210	147	105	39	26	26	10	6	13	9	8	6	2	0	0	1	4	4	61
	20	10	8	14	5	4	6	5	0	1	2	3	5	5	9	5	6	5	5	5	0	6	7	6	7	5
Q	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
	22	32	26	50	112	94	43	30	38	83	43	123	116	77	70	142	153	198	226	201	184	147	115	187	88	105
	23	59	40	47	97	84	87	113	100	138	157	130	100	173	144	240	158	234	290	155	69	69	66	70	47	120
	24	40	41	36	24	36	52	37	35	43	20	18	10	15	17	13	45	132	160	187	137	95	78	54	46	58
	25	48	75	92	95	61	50	58	72	62	41	56	97	59	75	56	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	46
	27	25	32	45	45	51	53	61	84	53	76	92	67	60	187	88	29	29	60	39	39	81	62	56	69	68
	28	62	38	49	36	44	58	76	46	42	35	49	24	28	36	28	27	20	23	23	27	23	30	24	32	37
	29	21	20	23	36	39	31	28	30	35	32	36	59	46	28	24	18	30	31	24	18	16	18	16	16	26
Q	30	18	14	12	24	27	30	32	28	31	32	33	34	22	17	14	19	21	12	13	19	20	25	19	16	22
MEAN	41	44	49	60	59	59	67	66	64	68	67	73	63	65	73	71	71	72	68	55	54	46	42	37	59	19
50 MEAN	15	13	15	18	19	18	18	17	20	21	23	38	35	16	13	11	14	15	15	21	21	29	21	18	16	19
SD MEAN	39	32	68	123	118	104	144	136	110	132	147	183	145	159	237	177	162	141	96	80	77	67	76	54	115	115

VALUES ARE EXPRESSED IN GAMMAS

DECEMBER 1970

AU INDICES

UT

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	17	18	14	16	13	15	18	18	21	26	27	22	17	11	11	12	16	14	13	12	12	13	15	15	16
	20	22	19	21	18	16	15	14	14	20	21	18	16	17	22	22	30	50	37	90	93	47	33	22	30
	31	26	31	24	23	29	35	45	62	76	42	20	16	14	13	37	19	28	12	13	14	31	40	45	30
	29	24	16	17	16	24	28	31	83	65	33	40	52	41	29	38	28	24	27	46	86	72	116	132	44
	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
																105	162	139	99	116	108	54	22	25	68
	17	24	11	48	21	19	57	69	62	47	111	86	44	81	96	66	49	70	57	93	143	86	109	74	64
	40	35	34	33	28	33	39	41	28	36	57	46	129	122	92	66	38	27	68	86	91	57	54	42	92
	128	106	197	142	111	97	50	74	131	133	85	117	91	166	66	47	38	27	68	86	91	57	54	42	43
	53	54	38	38	39	63	80	62	65	32	77	116	49	37	52	43	13	11	21	20	13	15	16	16	24
	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	17	13	15	17	12	13	21	22	24	22	21	18	19	20	12	12	11	13	11	10	12	15	14	19	16
	18	21	24	20	19	18	22	25	24	47	54	57	107	98	90	41	17	14	22	18	31	40	89	99	61
	94	70	46	52	38	27	26	31	55	32	25	20	21	19	16	14	34	46	56	27	25	43	94	146	44
	101	149	232	227	282	310	71	104	150	192	86	84	206	71	63	40	14	35	48	147	158	106	114	98	120
	47	85	74	36	30	35	24	33	89	73	47	76	48	116	85	66	78	51	70	67	30	33	31	45	56
Q	48	56	73	51	39	38	65	56	26	24	11	23	84	33	12	24	25	14	20	16	16	17	28	72	33
	61	58	41	42	57	35	50	48	40	29	29	23	24	10	4	24	25	31	13	29	29	22	23	24	32
	29	22	23	23	24	27	37	30	39	28	15	14	12	13	12	9	5	8	18	19	18	31	32	33	22
	32	24	25	35	23	20	35	43	121	148	66	31	29	25	21	13	12	15	20	46	38	34	126	96	45
	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
	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
	39	65	72	58	46	56	66	89	59	45	40	36	36	50	63	39	65	46	13	23	42	82	62	37	51
	36	54	29	98	81	49	66	36	37	28	42	73	59	89	54	54	60	59	37	22	16	21	27	69	47
	39	122	111	80	84	89	82	56	81	190	55	32	28	54	33	67	44	18	17	38	69	42	35	39	61
	24	61	25	17	18	16	15	15	14	10	10	15	23	22	18	45	42	45	51	36	67	35	45	51	32
	31	32	33	49	52	64	132	80	92	65	36	21	19	25	37	35	41	36	22	22	30	38	41	38	44
	31	36	46	83	59	35	40	45	75	91	76	80	48	101	111	61	86	78	97	129	126	135	238	205	87
	220	166	111	130	106	125	134	71	55	98	122	137	222	215	49	132	208	156	91	105	121	116	65	68	127
	143	49	46	53	65	112	96	88	50	104	39	23	20	43	49	55	68	91	106	95	87	85	71	36	73
	78	78	108	201	194	83	46	37	26	21	19	19	16	22	30	16	70	66	45	33	31	35	21	20	60
	21	18	15	29	18	13	13	11	14	15	16	22	24	23	18	21	16	17	18	18	21	25	24	23	19
Q	55	53	52	55	52	50	47	41	57	60	51	50	53	57	41	40	43	39	39	46	51	46	54	54	58
MEAN	28	24	20	25	25	19	24	23	24	26	23	25	23	31	14	16	16	18	14	18	18	19	18	17	21
90 MEAN	109	126	165	125	123	127	68	26	101	137	79	89	119	124	67	70	76	57	53	65	90	71	60	56	91
50 MEAN																									

JANUARY		AO INCHES										VALUES ARE EXPRESSED IN GAMMAS													MEAN			
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				
D	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	7	12	0	-90	-10	-18	-20	-125	-118	-43	-72	-146	-256	-135	-106	-116	5	-47	-45	-213	-130	-55	-106	-93	-26			
Q	-72	-6	-16	-13	19	17	-10	-53	-88	-48	-31	-11	-41	-83	-33	0	-13	-24	-9	-6	-16	-61	-21	-1	-10			
Q	0	0	2	3	6	2	-9	10	53	-10	-18	2	-7	-2	-38	-61	-53	2	14	5	-13	-46	-38	0	4			
Q	0	12	12	0	9	5	16	14	13	-4	-28	23	25	0	-12	0	18	24	16	15	5	-4	-5	-66	-10			
Q	-8	10	8	9	14	4	5	5	14	7	0	-26	-76	-57	-25	6	5	-16	-89	-45	-2	11	8	5	-9			
Q	10	9	9	6	15	11	12	17	13	4	5	4	-6	-2	-5	-29	-93	-134	-104	-13	25	16	7	-1	-18			
Q	-10	-13	6	6	4	14	19	14	17	22	35	24	21	14	23	24	0	-45	-9	14	18	-5	-33	-24	-2			
Q	-72	-31	43	30	6	0	38	-7	-44	44	-5	16	11	1	-5	-24	-70	-79	-44	-10	0	1	3	3	-13			
Q	-25	19	-37	30	20	11	9	10	11	9	3	-31	-9	-27	7	-1	3	-21	-20	-5	0	1	3	3	-2			
Q	7	11	25	31	19	17	27	16	10	0	4	0	-23	-25	-32	3	-2	-3	-8	-18	-16	-6	3	-35	1			
Q	-103	-6	21	-4	8	11	18	-11	-22	0	3	0	-1	-1	-2	-1	-12	-74	-55	-12	-19	-101	19	44	-13			
Q	25	21	13	5	11	14	10	19	12	3	8	9	-1	-1	-52	-95	-49	-4	-1	1	4	3	8	12	-1			
Q	12	8	6	-21	-41	-1	25	19	21	22	24	17	11	-36	-14	0	0	1	5	5	2	7	18	23	15			
Q	22	41	48	38	27	62	27	21	16	11	7	9	14	7	7	0	-7	-46	-8	-8	2	4	7	18	23	-89		
Q	30	-25	-23	13	12	7	14	-50	-01	-48	-17	-120	-85	-161	-194	-107	-192	-148	-90	-161	-103	-139	-103	-162	-27			
Q	-138	-13	-113	-35	-18	-21	17	-1	7	5	4	0	-1	-2	-4	-16	-16	-23	-16	-23	-13	-3	8	-2	-4			
Q	-9	-63	-9	3	-15	4	-45	10	16	9	0	12	6	6	0	-9	-28	-6	-1	1	4	3	8	23	15			
Q	4	5	8	11	9	0	4	6	2	-6	1	11	1	1	-31	-92	-35	-22	-40	-23	-29	-92	-55	-3	-15			
Q	-17	-23	-8	5	-9	1	4	8	9	-13	-22	-15	-22	-90	-91	-6	-9	0	-36	-85	-114	-30	14	0	-23			
Q	15	12	12	19	0	-8	-27	0	-5	-33	-24	-7	2	-75	-55	10	0	-3	-11	-55	-22	-46	-12	-4	-14			
Q	-59	0	3	1	0	13	7	0	5	9	0	-9	-4	3	-3	-13	-75	-35	-12	-22	-24	-20	3	6	-9			
Q	-48	-7	-2	-48	-17	-13	-17	-24	10	16	10	7	-10	-3	-8	-3	-3	-3	-8	-9	-12	-6	-6	-55	-41	-13		
Q	0	9	9	3	-7	-3	21	11	10	-75	-146	-27	-34	-17	-11	-55	-49	-36	-26	2	-25	-105	-5	5	-30			
Q	3	-3	-10	-9	12	13	9	0	-17	14	12	4	15	2	-8	-11	-13	-16	-3	0	0	4	0	0	0			
Q	1	6	-7	-4	10	21	10	10	-36	1	15	13	12	-1	-35	-10	-49	-87	-35	-27	-6	2	15	-9	-5			
Q	12	24	11	10	12	13	12	13	12	11	12	19	11	3	3	11	10	9	5	7	13	13	11	12	-5			
Q	-31	-9	3	3	14	-4	-36	-43	-5	17	11	8	6	5	6	-38	-83	-14	-48	-48	35	-18	21	-16	-10			
Q	-44	2	3	5	-11	-29	-60	6	12	10	-23	-8	-13	-1	6	-1	-12	3	-26	-39	-3	12	0	6	-11			
Q	-63	-103	-94	-36	-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			
SD 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	-89	-90	-59	-61	-76	-62	-49	-91	-56	-44	-44	-60	-44			

FEBRUARY 1970			AO INDICES										VALUES ARE EXPRESSED IN GAMMAS													MEAN
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		
0	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	
	8	21	24	-28	-26	4	23	5	-6	-88	-73	-139	-150	-38	11	0	9	-29	-85	-73	-11	-120	-27	-50	-130	-45
0	-24	-29	20	-3	6	7	6	9	4	0	0	-21	-26	-67	-43	0	-10	-3	-3	-1	-2	1	4	7	4	-15
	2	10	3	8	6	7	0	12	-17	-100	23	-23	-83	-146	-57	0	7	-91	-168	-33	-22	-6	-52	21	13	-20
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	18	15	-16	5	30	6	4	0	0	0	0	-1	-10	-22	-30	-7	2	2	2	2	2
	1	1	3	3	2	3	1	4	4	6	5	5	-2	-3	0	0	-3	-3	-2	8	-3	4	0	2	0	1
9	2	1	0	0	0	9	5	7	7	7	5	2	0	-3	-18	0	-26	-41	-33	-22	-35	-18	-7	0	4	-6
	4	3	-6	-13	3	-2	-2	7	7	0	4	1	3	3	-5	0	-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	7	0	0	-14
13	4	4	2	4	3	11	10	0	-22	-7	1	0	-3	-5	-3	-3	-17	-18	-12	-6	-1	-2	0	0	0	-3
	1	7	6	5	5	4	4	4	1	5	2	1	0	-4	-3	-5	-4	-1	0	3	2	-1	-2	-2	0	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	0	-1
	4	6	-30	-145	-42	-11	4	-7	-15	-17	-93	-87	-38	-42	-104	-118	-68	-26	8	8	19	8	7	0	0	-23
15	0	0	-32	-42	-47	-74	-02	-3	-3	3	-79	-11	13	0	-12	-42	-22	-56	-93	-73	0	16	12	9	0	-25
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	0	-12
	9	5	1	9	9	10	7	7	10	12	-39	-43	-4	-3	-1	-6	-8	-136	-91	-91	-58	-86	-94	-14	0	-28
18	4	-12	-18	-6	-39	-15	1	-48	16	14	21	4	9	-71	-175	-14	5	-0	-59	-7	-19	-9	-70	-44	0	-28
	-24	-32	1	1	4	10	3	6	6	7	3	-31	-61	-14	-15	-9	-14	-2	0	7	3	1	0	3	0	-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	0	-4
21	4	1	-6	0	6	5	-2	4	-2	-2	1	-4	-6	-5	-2	-3	-7	-7	-1	0	-8	-2	-3	-2	-2	-2
	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	-4
23	0	2	2	0	6	6	3	3	5	5	3	1	0	0	1	1	1	-1	1	5	11	11	7	4	0	0
	6	6	0	-46	2	7	0	-47	-28	2	-60	-34	0	9	13	-52	-162	-139	4	4	26	31	4	2	-1	-19
24	2	-7	-5	5	4	-1	-9	-7	4	1	0	-1	8	0	0	-8	-32	-23	5	7	6	3	0	-1	-2	-2
26	-4	-39	-56	-36	-27	-7	-37	-35	-69	-37	11	4	-94	-86	-46	-5	8	-37	-16	-10	-9	-6	-18	-9	-28	-28
	-8	-10	-10	-9	-15	-41	-19	-33	-44	-16	-31	-12	-19	-26	-20	-15	-29	-67	-23	3	-26	-31	-37	-49	-20	-20
28	-176	-194	-91	11	20	-7	-44	-35	33	21	-23	-24	18	-34	-8	-26	-46	-55	-76	-24	6	14	12	-25	-31	-31
	-5	-9	-8	-9	-3	-2	-3	-5	-4	-5	-12	-16	-22	-26	-24	-20	-30	-36	-21	-15	-8	-9	-12	-14	-13	-13
50 MEAN	2	1	-1	1	4	6	3	3	-3	1	2	1	-3	-4	-5	-9	-14	-12	-11	-14	-9	-3	-1	-1	-29	-32
50 MEAN	-31	-30	-19	-40	-8		-3	-14	-7	-36	-45	-61	-47	-50	-29	-36	-79	-95	-44	-28	-17	-11	-1	-1	-29	-32

VALUES ARE EXPRESSED IN GAMMAS

AO INDICES

MARCH 1970

UT

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	10	-63	5	51	33	-44	-51	-63	-60	-9	5	-38	-96	-86	11	12	-7	-4	1	-8	0	0	-19
2	-46	-129	-100	-6	-64	-130	-15	12	-42	-169	-100	-81	6	6	1	-20	0	-66	-11	5	4	7	-24	-66	-44
3	-20	5	-2	-1	-3	-7	-19	5	-71	-7	19	7	1	5	-87	-23	-61	-186	-114	-105	-97	-79	-20	0	-33
4	-2	-14	-56	17	8	23	49	-3	-40	-99	-72	-123	-179	-180	-141	-129	-67	-100	-88	-95	-75	-30	-15	-58	-88
5	-16	19	19	17	14	12	-1	0	0	20	0	2	2	1	11	0	-50	-35	-133	-116	-68	-73	-31	-21	-17
6	-93	-71	-1	26	17	12	4	-10	-122	-103	-259	-33	-10	-10	-55	-59	-47	-23	-59	-38	-186	-131	-251	-213	-68
7	-153	-141	-94	-111	-87	22	4	-11	-83	-169	-155	-112	-12	-7	-113	-192	-160	-112	-214	-149	-8	20	13	-77	-80
8	-23	-9	-49	-213	-157	-172	-80	-37	-39	24	-120	-86	-75	-32	1058	-755	-3	203	-162	-82	-328	-21	-139	-58	-77
9	11	-11	-81	-272	-74	2	42	31	31	24	-98	-122	-237	-223	-133	-242	-256	-132	-5	0	-5	-70	-79	-131	-66
10	-80	-10	-11	-18	-13	-13	-14	-26	-58	-22	-33	-49	-24	-17	-23	-30	-58	-37	-59	-68	-79	-25	-13	-19	-35
11	-26	-26	-26	-21	-19	-14	-17	-18	-19	-10	-19	-21	-23	-15	-34	-24	-24	-16	-11	-12	-57	-99	-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	-28
13	-7	-8	-8	-10	-13	-7	-29	-76	-21	-13	-134	-19	-13	-75	-114	-71	-39	2	-5	-44	-69	3	-2	-7	-52
14	-6	-16	-44	-17	-7	-5	-3	-2	10	-9	-15	-16	-14	-11	-10	-7	-4	-5	-4	-1	0	-1	-4	-4	-8
15	-4	-35	-39	-38	-53	-46	-34	-5	-6	-4	-29	-21	1	0	-40	-107	-37	5	0	-45	-25	-9	-3	-11	-24
16	-7	-9	-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	0	0	-56	-61	-16	-3	-29	-89	1	-13	-22	1	-45	-69	-16	-24
19	-10	-10	-13	-14	-6	0	-2	-18	-11	3	-5	-3	-20	-46	-11	-11	-6	-11	-31	-3	-1	-102	-25	-22	-16
20	-18	-3	-7	-9	-6	-6	-10	-10	-6	-2	3	-3	-43	-23	0	-21	-16	3	-9	-93	-16	-2	-15	-19	-14
21	-10	11	-4	-8	9	5	-4	-10	0	1	-7	-7	-13	-2	-3	-47	-77	-38	0	17	15	0	0	-2	-7
22	-5	-3	-1	-6	-5	-2	-5	-9	-5	4	5	-10	20	10	0	-7	-6	4	6	-1	5	3	-3	-5	-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
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	-8
25	-4	-7	-2	0	-2	-2	-3	-10	4	0	-6	0	-4	-3	0	0	0	1	0	1	3	3	0	-2	-1
26	-4	-5	-24	-28	-52	-36	-18	-1	3	-4	-7	-2	0	-2	1	-27	-32	-3	-12	-11	-4	3	5	1	-11
27	-1	-5	-9	-12	-9	-5	-4	17	33	32	46	73	32	3	-9	0	2	12	-12	1	17	-7	-88	-59	3
28	-20	-33	-34	-135	-69	-84	-34	-13	0	-74	-107	-98	-45	-43	-82	-41	-25	9	11	-83	-24	-5	-74	-174	-55
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	-85
30	-55	20	13	1	-3	31	-54	-37	-62	-15	-46	-59	-21	-42	-14	-12	-76	-23	9	11	1	-76	18	6	-20
31	0	1	-25	-31	-76	43	52	-88	-75	-77	-101	-37	-2	-20	-63	-83	-7	13	23	13	-30	-11	-50	-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
50 MEAN	-7	-2	-4	-5	-1	-1	-5	-8	-1	-4	-10	-7	-1	-2	-8	-14	-19	-8	2	5	6	-2	-4	-4	-4
50 MEAN	-52	-66	-58	-120	-75	-19	4	-25	-58	-60	-162	-78	-67	-81	139	-266	-95	-10	-84	-197	-95	-61	-101	-129	-75

APRIL			AO INDICES										VALUES ARE EXPRESSED IN GAMMAS												MEAN	
			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		
1	-2	-17	-20	-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	-19	-11	-16	-13	-13	-10	-27	-17	-14	-5	-20	-69	-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	-100	-48	-3	-5	-4	-79	-69	-6	0	-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	
6	9	-9	-40	-16	-69	-30	-113	-52	6	-7	-264	-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	5	6	-18	
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	
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	
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	
14	3	5	0	-8	-7	-8	-4	0	-2	-7	-10	0	2	-11	-13	-3	-3	3	4	5	4	6	0	-6	-2	
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	-80	-122	-9	
17	-174	-77	-65	-25	-84	-10	9	5	11	-126	-58	-14	-12	-83	-66	-86	-54	-56	-55	8	-29	-226	-64	8	-59	
18	12	11	-2	-6	-2	-2	-3	0	30	-82	-138	-145	-140	-132	-117	-21	21	8	14	33	17	-78	-160	-145	-48	
19	-45	-112	-159	-114	-3	42	-80	-170	-61	8	-106	-143	-13	2	3	-8	-16	-28	0	13	-18	-27	5	12	-43	
20	3	-7	-39	-91	-56	-18	-5	-3	2	7	17	-21	-75	-104	-29	-43	-24	-28	-80	50	45	21	6	-34	-19	
21	-36	-109	-45	-13	9	-57	-74	-20	-117	-104	-174	-92	-176	-159	-163	-230	-324	-395	-247	-101	-231	-310	-193	-110	-15	
22	-187	-276	-231	-225	-54	-44	-10	-41	-44	-162	-74	-25	0	2	3	-23	-25	8	7	-2	-3	-4	-7	-4	-60	
23	-5	-27	-40	-7	26	-24	-68	-4	22	16	-22	-3	-180	-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	-38	-110	-29	20	33	-74	-19	
27	-95	-36	-47	-47	7	6	8	13	-1	0	21	-20	-27	-29	-11	-19	-2	0	-16	-4	31	14	8	5	-20	
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	0	-32	-36	-34	51	68	43	-35	-5	-7	
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MEAN	-33	-39	-41	-33	-24	-16	-28	-12	-15	-27	-32	-27	-34	-48	-29	-33	-27	-27	-21	2	-5	-18	-22	-23	-25	
50 MEAN	-5	-29	-12	-18	-5	-8	-1	2	5	2	7	7	-7	-11	-10	-2	-9	-8	-9	6	-7	3	2	-2	-4	
50 MEAN	-77	-96	-84	-66	-51	-32	-39	-24	-28	-70	-115	-49	-56	-80	-64	-92	-92	-105	-73	-3	-41	-108	-63	-26	-65	

		VALUES ARE EXPRESSED IN GAMMA																									
		AD INDICES																								MEAN	
MAY	1970	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
UT		7	14	2	6	1	42	-42	-56	-6	0	0	5	14	-76	-28	5	-2	4	19	23	-22	19	-21	-16	-9	
1	-3	-2	2	-3	-28	-12	-14	-10	-5	-5	1	0	1	16	6	3	3	6	-28	-15	-8	4	6	-8	-42	-7	
2	-6	6	0	-5	-5	-9	-10	-1	-5	-5	2	12	26	-41	-3	-28	-23	12	-19	-55	10	41	31	-107	-46	-12	
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7	-4	-24	-10	-6	-4	-4	-4	-4	-12	17	5	0	0	3	8	7	2	2	-82	-19	15	0	3	3	7	-2	-9
8	-11	-10	-1	-4	-15	-25	12	12	11	11	8	3	10	0	0	0	-10	-17	-21	-3	0	11	2	0	-1	-2	1
9	3	4	0	-19	-10	12	-12	12	11	11	20	13	5	0	-3	-8	-16	-12	-4	4	3	4	2	0	0	-1	1
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11	-2	20	-28	7	-22	-1	8	26	18	35	35	32	-7	-29	-78	-102	-45	-16	38	-21	-12	2	32	15	34	-6	-6
12	2	-6	-79	-92	-20	22	2	2	3	1	10	-77	-40	15	15	15	-12	3	3	14	14	9	22	18	19	-1	-1
13	13	-34	6	-7	15	21	23	-17	23	-11	13	15	1	6	15	7	6	-14	-66	-25	-20	-1	12	35	-19	-2	-2
14	-27	-22	-8	-14	31	21	0	0	37	25	-11	-8	18	10	-4	-5	-2	3	-1	0	-10	-3	7	16	17	1	1
15	-8	10	8	7	9	-21	-23	14	-4	5	16	22	22	26	22	-31	-37	-47	-76	15	23	36	37	31	-28	-1	-1
16	-102	-28	22	0	50	-74	-27	7	13	14	31	31	10	26	29	27	27	35	25	36	24	21	26	32	7	4	3
17	12	13	-26	-51	8	4	10	10	12	6	6	6	10	15	13	0	-24	-37	-33	30	26	27	9	-12	16	11	11
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19	-42	-59	-43	18	-24	-22	25	25	28	45	21	-30	21	10	-32	23	-38	-65	-41	42	30	-41	-30	-9	-12	-10	-10
20	-60	-90	-96	-136	-122	-84	-74	-46	-18	9	9	-24	22	26	22	-31	-45	1	2	5	-9	14	0	0	-25	-32	-32
21	-59	-45	-48	-28	-3	17	21	33	15	26	34	42	42	58	39	0	-20	-37	-33	-13	33	20	17	19	10	4	4
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24	-39	-39	-39	-26	-65	-42	-28	-2	-2	0	-1	14	24	-51	-57	-66	-13	-29	-26	-15	9	0	16	19	13	-10	-10
25	9	0	8	-10	-11	-5	-1	-7	-6	-11	-14	-14	3	-4	-2	-5	-36	-29	-15	-13	6	6	20	24	14	-5	-5
26	31	8	6	-16	-15	-21	20	43	21	6	22	43	43	1	53	-23	18	-99	-72	-28	-40	-57	-21	-60	-72	-21	-21
27	-1	-169	-81	13	21	13	-8	7	28	68	-206	-17	-17	-88	-9	105	48	31	28	14	0	35	29	32	16	-7	-7
28	-54	-42	-17	-4	-16	10	-13	-66	-11	49	20	-3	-3	-36	-35	-3	-2	-8	1	26	18	42	19	7	3	-3	-3
29	-31	-36	-15	-4	-31	-28	-9	33	17	-134	-63	-16	-16	-16	-14	-6	11	0	38	-4	32	12	5	1	0	-11	-11
30	-11	-9	-13	-8	-32	-15	8	-10	-9	-7	2	11	11	21	-57	-4	24	45	24	-2	-3	-3	-2	-4	-14	-3	-3
31	-14	-16	-14	-13	-11	-9	-4	1	5	6	-7	3	3	-2	-13	-7	-7	-8	-11	3	9	11	11	-2	-9	-4	-4
MEAN		-1	-6	-4	-9	-10	-6	9	3	5	6	1	1	-1	-1	-1	-13	-12	-24	-4	7	9	9	9	23	-27	-9
SD MEAN		-14	-18	-32	4	-11	-4				36	-32	-13	-28	-41												
SD																											

VALUES ARE EXPRESSED IN GAMMAS

AO INDICES

JUNE

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

0	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
0	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	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN		
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN			
4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN				
5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN					
6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN						
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN							
8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN								
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN									
10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN										
11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN											
12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN												
13	14	15	16	17	18	19	20	21	22	23	24	MEAN													
14	15	16	17	18	19	20	21	22	23	24	MEAN														
15	16	17	18	19	20	21	22	23	24	MEAN															
16	17	18	19	20	21	22	23	24	MEAN																
17	18	19	20	21	22	23	24	MEAN																	
18	19	20	21	22	23	24	MEAN																		
19	20	21	22	23	24	MEAN																			
20	21	22	23	24	MEAN																				
21	22	23	24	MEAN																					
22	23	24	MEAN																						
23	24	MEAN																							
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28	MEAN																								
29	MEAN																								
30	MEAN																								
MEAN	MEAN																								
50 MEAN	MEAN																								
50 MEAN	MEAN																								

VALUES ARE EXPRESSED IN GAMMAS

AD INDICES

JULY 1970

UT

JULY	1978	NO	INDICES	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	
UT																													
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	35	-12	-13	-20		
4	-283	-95	-34	-11	-34	-42	-69	-2	-49	18	-3	9	35	-21	-4	-5	-2	0	8	0	0	-5	-12	-13	-26	-7			
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					
6	-143	-29	-76	-56	-27	-10	-69	-40	-98	-24	-7	14	-60	-57	27	19	21	22	16	11	6	1	3	7	-24				
7	-6	7	-9	-12	-14	-13	-4	-13	-40	-24	-13	-13	7	7	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	-10	-7	-57	-8	29	50	-1	-167	-5					
9	-111	-12	39	101	-22	-9	40	14	44	-29	-17	-169	-213	-59	83	46	26	44	83	77	-52	-33	-86	-84	-17				
10	-245	0	6	1	0	-1	4	-2	-8	-2	22	37	34	21	6	-90	-42	-36	-13	-3	3	-41	8	-7					
11	-42	-15	-58	-17	-5	3	4	-47	-47	0	15	-26	-21	-11	-17	-20	-34	13	-2	11	-11	-60	-5	-12	-22				
12	-76	-58	-8	-67	-15	-12	11	14	13	7	20	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	23	22	-2	-17	-5	-21	-55	-95	13	32	-41	-18	-8	-17				
14	-9	-51	-70	18	-44	-21	0	2	-32	-34	9	23	11	18	10	18	2	13	-72	-58	18	0	-1	-34	-11				
15	-29	-1	-2	-9	-9	-3	0	0	13	-42	-46	-26	8	51	40	38	39	37	23	17	3	0	4	-7					
16	-35	-07	-09	-3	-17	-34	-22	-11	-7	-4	-2	16	-36	-64	10	3	-9	-18	-85	-33	0	-5	-1	-1	54	-6			
17	-4	3	-6	-11	0	1	1	0	-2	-5	-3	1	12	17	-39	-19	-62	-18	-8	26	12	-1	11	54	-6				
18	18	9	-4	-11	38	-6	-3	0	0	14	15	9	15	16	9	3	-1	6	8	1	-15	6	0	5	6				
19	1	-4	2	-38	-68	-17	10	4	7	29	19	18	9	1	7	1	-8	-42	0	11	22	2	11	2	-8				
20	25	-2	-19	-25	-9	-11	-17	-11	15	2	-2	0	4	5	4	3	0	7	2	-4	3	-2	-16	-105	-8				
21	-163	-34	-19	50	1	0	19	13	39	38	73	-16	13	-69	-3	1	-25	21	-73	-46	5	12	-11	-104	-16				
22	-59	-4	4	-2	-47	-38	-9	48	-7	-59	-75	14	10	-2	-1	-34	-35	-35	48	23	25	10	-15	-59	-13				
23	-57	-52	-31	-18	0	32	26	-1	54	43	41	47	1	6	16	35	4	0	15	29	13	1	5	-1	8				
24	-4	-74	-96	-20	-24	-14	-85	12	7	-2	-3	28	5	-41	-45	-35	23	62	43	18	39	33	-6	-6	-12				
25	-98	-55	49	38	-25	-59	-100	-22	-204	-195	-31	-156	-18	-35	-17	10	40	15	35	20	29	-104	-58	-174	-74				
26	-141	-11	-37	-12	4	-19	-76	-10	-95	-72	-82	-82	-108	-68	-4	1	1	4	6	7	9	17	-72	-2	-47				
27	-6	-4	-19	-43	-9	-22	-43	-11	2	-19	-32	-28	-49	-60	-24	-9	-47	-53	-8	-11	-17	-1	-6	-10	-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				
29	-9	-14	6	13	-124	-205	-134	-99	147	-27	-170	-84	3	26	-61	-22	-6	-55	-60	19	5	20	9	0	-62				
30	-1	-5	-4	-8	-13	-70	-22	-14	-10	-19	-10	0	0	0	11	-29	-4	2	-27	-1	16	15	-23	-24	-12				
31	-38	-15	-39	-67	-51	-69	-4	-26	-22	6	-14	-20	-64	-65	-24	-47	-64	-138	-106	8	12	-39	-17	-53	-48				
MEAN	-49	-38	-23	-16	-21	-34	-26	-18	-22	-23	-11	-13	-11	-16	-4	-7	-7	-11	-5	3	9	-3	-23	-42	-17				
50 MEAN	-4	-5	-5	-17	-9	-11	-1	-2	-1	-5	-5	-2	7	15	11	9	8	3	9	9	3	-2	6	-5	-37				
50 MEAN	-125	-23	16	41	-84	-55	-46	-69	-67	-93	-5	-76	-36	-23	-4	-17	-1	-1	-8	-8	-2	-29	-67	-75					

VALUES ARE EXPRESSED IN GAMMAS

AO INDICES

AUGUST 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
0	-41	-17	-64	-44	2	5	10	10	11	12	7	5	0	-2	-5	-4	-3	1	3	6	0	1	0	6	-8
1	5	-7	-51	-20	-61	-36	-2	1	44	-30	3	-1	8	7	-7	3	4	2	5	7	3	-2	-2	1	-5
2	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
3	-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
4	-6	0	4	-12	-29	0	1	-4	2	-1	-4	-2	-1	1	4	1	0	1	8	8	1	0	1	1	-1
5	5	2	1	1	-2	-6	0	4	25	-5	-23	4	-2	8	-1	8	17	19	22	27	29	-47	-8	-9	2
6	17	26	5	4	4	3	15	17	17	8	7	7	0	0	5	-18	-56	-8	15	33	28	53	-21	-53	-5
7	-16	1	4	-7	9	2	18	-8	151	-27	-178	-39	-47	0	0	-40	0	25	-23	-59	0	8	-9	-57	-37
8	-127	-211	-35	-24	-18	-5	-17	9	-55	-9	-11	-133	-46	-6	-6	0	7	-55	-93	4	7	10	2	0	-32
9	0	-18	-1	-40	5	-4	-18	-22	-52	-34	-5	-59	-82	-6	13	8	-23	-8	12	-4	3	19	-8	-4	-15
10	-2	-13	-16	-28	-64	-22	11	16	4	-10	-18	7	6	-29	-39	-26	3	5	17	-21	-23	-10	-2	-35	-18
11	-56	-63	-155	-35	-122	2	8	23	-33	-63	5	16	4	-4	-8	-4	-4	0	-3	3	-0	16	12	9	-22
12	2	-6	-1	-20	0	10	-17	11	6	16	3	9	15	-33	3	19	-2	-8	38	-19	-1	-16	-75	-7	-23
13	15	24	0	-46	-8	0	-5	-1	7	5	-4	-2	-9	-9	-7	-12	-16	-16	-5	-14	-15	-11	-5	10	-5
14	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
15	0	31	4	16	30	53	0	13	18	19	21	34	20	-18	25	27	23	-9	-70	11	8	24	-19	-12	5
16	-130	95	60	-16	-235	12	-259	9	134	23	-156	-33	143	26	50	-38	-169	-10	-155	-88	36	12	-37	-12	-40
17	-47	-116	-59	-12	-53	6	-6	-72	-81	-57	-17	-135	-156	-28	-15	32	-32	-166	-34	32	27	-12	-68	-22	-71
18	-187	-127	-23	-15	-17	-48	-58	-3	0	-55	-82	15	0	-27	-23	-31	-65	-13	-2	14	9	3	0	-8	-34
19	-9	-16	-15	-13	-17	-19	-16	1	-31	-32	-35	-32	-47	-7	-16	-9	-1	-3	-5	3	-6	-8	-4	5	-13
20	7	-19	-55	-52	-20	-20	-31	-25	-37	0	25	4	1	7	-2	6	-34	-30	-51	11	6	3	-2	-7	-14
21	-12	-23	-20	-22	-21	-29	-37	-16	7	19	16	-16	-107	-76	-44	-15	-23	-44	1	-21	-23	-1	2	-5	-23
22	-11	-15	-15	-23	-22	-13	-34	-1	-3	13	17	9	-51	-13	-5	-8	2	-21	2	19	14	22	5	-2	-7
23	0	-9	-1	-59	0	-2	-6	-11	-12	-12	-8	-1	8	-7	-17	-9	-15	-3	-35	-12	-11	-21	-33	-5	-12
24	-14	-21	-18	-50	-55	-54	-65	-64	-15	-32	0	-25	-39	-56	-50	-23	-53	-39	-6	-15	-14	-28	-45	-25	-34
25	-68	-77	20	15	-131	-94	-24	-48	-95	-31	-11	-111	-88	-14	-24	-55	-28	-12	-31	-13	3	-40	-21	5	-51
26	-78	-93	-50	-41	-2	-81	-91	2	2	-36	-5	16	28	7	-133	-67	-17	1	-21	-7	-4	-27	-21	-1	-31
27	12	7	-4	-11	11	15	-71	-3	12	-3	-8	-8	-1	3	-155	-162	-77	-69	-77	-31	14	-25	5	-62	-23
28	-11	-1	26	-70	-20	-6	4	-14	-6	0	18	31	-23	-24	-21	-38	-4	-17	-1	3	0	0	1	4	-10
29	6	-79	-66	-50	-21	-34	-26	0	-11	16	12	18	12	-5	-1	-11	-8	13	1	33	-5	11	12	9	-18
30	3	0	-7	-3	9	-29	-62	-87	-80	-3	2	13	27	-29	-75	-6	16	48	57	-31	-11	15	2	-5	-12
31	-24	-22	-19	-29	-30	-10	-26	-4	-8	-21	-20	-17	-15	-18	-15	-18	-25	-16	-12	-6	1	-2	-16	-26	-17
MEAN	-18	-7	-9	-23	-8	-2	1	2	4	-4	-2	-16	-39	-19	2	-18	-10	2	1	5	-3	-4	-6	-1	-4
50 MEAN	-76	-56	-2	-29	-80	10	-60	-22	-38	-89	-150	-116	-39	-39	2	-20	-55	-12	-67	-25	15	-4	-27	-65	-66

SEPTEMBER 1970 AO INDICES

VALUES ARE EXPRESSED IN GAMMAS

UY	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
0	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	
1	-42	-12	21	18	15	26	28	14	6	-17	-69	-47	-50	30	-14	0	-69	-57	16	39	-46	38	6	-11	
2	9	9	8	-80-115	5	11	24	-60	-115	-21	-21	-97	13	23	0	83	0	19	20	9	-71	-65	-35	-39	
3	31	11	-1	8	7	7	22	-1	-24	-4	5	15	-91	-3	9	22	-69	9	-2	-26	-31	9	7	-3	
4	-46	-7	3	-12	-39	-8	16	13	12	7	1	3	0	-7	-3	-30	-123	-38	-14	-37	-21	4	-6	-12	
5																									
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	
7	6	-7	0	1	2	7	2	14	17	1	4	6	-6	3	-8	-2	5	7	13	11	-9	-59	4	10	
8	9	5	5	9	19	-49	-28	14	8	11	19	6	-14	-50-104	-9	-75	-103	-9	-19	-23	16	7	6	3	
9	3	6	4	-2	1	26	18	18	18	3	-2	0	-13	-19	-21	0	-37	-14	13	0	11	-85	-66	-21	
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	
11	7	5	1	0	-2	0	4	4	0	-3	-6	-5	-4	-1	-1	-7	-9	-8	-5	2	5	7	11	11	
12	11	10	14	11	-105-103		-58	-42	-41	5	2	-3	-4	0	-2	-2	2	-16	7	12	12	9	9	9	
13	9	5	8	14	-23-146		-83	-67	-61	-104	-104	-44	-104	-105	-83	-20	0	-40	13	2	-141	-40	-4	-169	
14	-21	-45-104		-62	3	19	7	20	70	-24	-16	-109	-142	-177-124		-135	-35	-28	-24	-60-112	-21	-6	-12	-21	
15	-81	-64-100		-74	-19	1	-22	-7	10	14	26	-8	-50	-38	6	2	-4	-7	-37	-34	11	-9	-31	8	
16	-2	-21	-83	-4	-14	-73	-38	-30	-34	2	-22	-20	-56	-35	-11	-7	-2	-3	-56	-51	-47	-19	6	9	
17	0	-44	-61	-45	-41	-50	-162	-23	-38	9	5	0	-3	2	3	-23	-61	-23	-17	-3	-7	4	-28	-5	
18	-21	-70	-59	-104	-90	-31	-6	-65	-81	-8	-8	2	3	9	8	-81	2	5	-48	9	-2	-23	-44	10	
19	12	10	-23	-46	-83-115		-28	-4	-105	-118	-75	-22	-49	-58	-39	-3	-10	-129	-7	-100	25	2	-96	-31	
20	-14	-17	3	1	-13	-99	-89	4	-32	-85	-9	-34	-24	-76	-82	-69	-40	-21	4	-25	-14	-10	-162	-38	
21	-83	-76	-78	-63	-17	-46	-73	-136-111		0	21	6	-158	-242	-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	-30	-157	-81	6	-10	3	-7	-10	-40
23	-63	-13	2	3	0	4	-29	-76	-59	-109	-103	-24	-34	-28	-9	-10	-46	-61	-8	-1	10	21	15	-1	-26
24	-53	-25	0	-63	-71	-21	-3	-50	-45	-44	7	-1	0	15	5	-1	5	0	-15	-49	10	16	3	1	-18
25	11	8	6	-24	-91	-113	-64	-4	-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	0	20	12	5	3	8	-47	-41	-3	-5	-7	5	-11	-79	-10
27	-107	-84	-27	-50	-120-108		-70	-52	30	20	-19	-9	-14	-17	-44	-67	-21	-34	-49	-70	1	29	-6	-254	-51
28	-89	2	17	-10	-15	-8	1	6	7	7	9	12	6	9	12	3	3	5	-9	5	4	7	3	7	0
29	2	4	4	13	17	14	3	4	4	10	3	2	-3	-1	1	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	5
MEAN	-19	-18	-18	-24	-34	-32	-19	-20	-25	-21	-18	-13	-29	-26	-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	-40	-28	-30	-53	-39	-71	-64	-37	-56	-58	-74	-109	-82	-73	-23	-51	-44	-47	6	4	-17	-83	-51

OCTOBER 1970			AO INDICES												VALUES ARE EXPRESSED IN GAMMAS												MEAN	
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				
1	-49	-67	9	9	-8	-51	-9	16	12	6	4	0	1	3	6	-26	-22	-8	-57	-19	-29	21	16	-25		-19		
2	-16	9	16	0	-33	-6	2	-4	0	2	-33	-10	-3	-20	-16	-10	-13	-14	-26	-10	-7	-14	-4	-4		-13		
3	0	12	3	23	3	7	7	19	7	-9	-1	-2	-10	-8	-27	-109	-11	-10	-23	-19	-20	-74	-12	-13		-23		
4	-26	-35	-11	-38	-33	19	-53	-53	-73	-34	-11	-136	-39	-34	-33	4	-21	-79	-12	-11	-19	-4	-25	-12		-49		
5	12	0	-48	-7	10	-8	-89	-33	5	-47	-10	-1	-10	-6	-1	-5	-20	0	-2	-13	-6	-19	9	3		-14		
6	4	-20	-6	15	3	5	-1	16	3	-4	-20	-2	9	16	1	-6	-5	-1	7	-57	-32	-45	-5	7		-7		
7	5	1	3	10	5	5	7	-15	-10	7	2	-3	-8	-44	0	-7	-4	-3	0	1	1	2	2	3		-2		
8	9	6	0	6	12	10	4	3	3	1	-2	-4	-4	-2	-4	-10	-8	-6	5	3	1	-5	-2	5		1		
9	10	7	0	0	2	2	3	1	3	9	6	5	-2	1	1	-5	-5	-6	-32	-16	1	16	28	-30		-15		
10	0	0	2	6	-21	-23	-26	-69	27	14	11	3	1	7	1	0	-26	-97	-99	-62	-55	1	0	-1		-15		
11	-40	-64	-50	-14	12	-13	-77	-40	-76	-59	-59	-65	-63	-62	-74	-36	-37	-33	-39	-67	30	21	10	-30		-44		
12	-148	-90	9	-66	-17	-61	-23	-28	-79	-28	-13	9	3	-7	-6	-4	-6	-2	1	4	3	7	4	5		-35		
13	2	4	0	-4	-24	-24	-51	-51	10	-1	-2	-2	-113	-43	-11	-72	-101	-55	-58	-54	-15	-10	8	11		-33		
14	-40	-126	-81	-70	-64	13	-2	-19	-44	-16	-10	-48	-35	-31	-13	-13	-3	-29	-49	-44	-30	-39	-20	-10		-35		
15	-53	-27	-5	-13	-31	-26	1	4	0	-17	-18	-5	1	-24	-51	-16	-10	-11	-3	3	0	-25	1	8		-14		
16	3	0	0	-2	-3	-14	1	0	5	11	5	-13	-294	-63	-51	-108	-107	-173	-168	-58	47	60	38	-71		-49		
17	-57	-59	-40	-76	-71	-76	-227	-217	-133	-105	-69	-165	-144	-45	-11	-169	-118	-108	-239	-195	-68	-151	-106	-132		-137		
18	-106	-100	-110	-98	3	11	11	-30	-18	-46	-38	-71	-119	-39	-67	-97	-87	-99	-34	-19	-7	-45	-94	-34		-58		
19	-44	-41	-85	-72	-65	-46	-93	-36	-34	-27	-23	-71	-65	-96	-53	-34	-84	-46	-27	-47	-51	-20	-24	-32		-55		
20	-14	-30	-29	-67	-44	-71	-60	-10	-16	-149	-98	-43	-69	-20	-41	-65	-36	-30	-1	-1	0	-16	8	6		-37		
21	0	-4	-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	-11	-55	23	1	67	-49	-126	-148	-95	-89	-29		-47		
23	-12	-17	-27	-24	-87	-94	-104	-45	-6	-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	-66	-120	-19	-33	-83	-54	-6	-15	-14	-5	9	6		-23		
26	5	0	-50	-43	-7	3	2	7	5	0	-42	-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	17	0	-91	-27	22		3		
28	17	-25	-20	15	18	2	-44	22	24	11	2	5	11	7	-27	-60	-34	0	-66	-170	-123	-43	-19	21		-28		
29	15	11	19	15	20	-6	-39	55	33	22	16	4	0	-10	5	2	-25	-42	-108	-133	-107	0	-15	-55		-19		
30	-1	-2	-84	-66	-21	24	17	21	12	15	-54	-4	-4	-6	-2	-33	-88	0	-1	-2	-2	-4	-1	5		-11		
31	10	9	8	11	8	12	15	16	21	-34	21	8	0	-5	-10	-43	-4	-6	-1	-14	-26	0	18	9		0		
MEAN	-25	-21	-24	-22	-21	-17	-28	-24	-25	-10	-20	-39	-39	-38	-29	-35	-44	-31	-44	-47	-26	-20	-11	-10		-28		
5Q MEAN	-6	-2		-3	-2		3	-1		1	-3	-3	-4	-15	-14	-11	-8	-9	-9	-2	1	-5	2			-4		
5D MEAN	-42	-42	-58	-48	-40	-31	-76	-71	-65	-37	-61	-149	-110	-86	-78	-94	-116	84	-137	-70	-16	-40	-33	-61		-59		

NOVEMBER 1970		AO		INNOICES		VALUES ARE EXPRESSED IN GANNAS																							
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	-16			
	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			
D	6	-16	-26	-39	-65	-43	-18	-32	-62	-130	-71	-90	-74	-173	-162	-55	-56	-40	-20	-14	-9	-8	-75	-37	-16	-56			
	7	-33	-55	-163	-45	-49	-43	-18	-85	-238	-130	-266	-604	-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	0	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	-74	-80	-118	-43	0	-4	-41	-90	9	-1	-66			
	12	-43	-20	-25	-73	-65	-9	-22	-67	-33	-87	-47	-45	-26	-172	-169	-63	-130	-2	2	-5	-3	-3	-2	2	-47			
	13	0	-19	-51	-66	-1	0	-36	27	5	2	-41	-103	-144	-138	-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	-90	-62	-30	-10	-10	3	3	-29			
	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			
Q	16	3	6	0	13	9	7	11	8	10	2	-46	-37	-16	5	12	0	-36	-48	-35	24	19	-16	9	-2	-4			
	17	-18	-9	-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	61	0	5	14	-267	-190	-26			
	19	-85	-54	-70	-57	-17	-71	17	57	31	15	-8	-1	-9	-10	-9	-7	-5	-7	-9	-10	-10	-9	-8	-6	-15			
	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	-203	-104	-201	-194	-49	-35	-83	-113	-114	-104	-105	-102	-58	-125			
	22	-166	-120	-132	-110	4	-5	-2	-15	-48	-60	-88	-62	-103	-189	-145	-142	-175	-85	-106	-64	-93	-68	-65	-83	-88			
	23	-80	-128	-110	-117	-46	-70	-78	-126	-140	-191	-196	-147	-7	-48	-295	-363	-157	-13	-1	-100	-45	-48	-128	-77	-11			
	24	-11	-16	-23	-39	-12	-5	11	7	0	1	-4	-4	-2	-2	-6	-12	-74	-132	-35	3	25	8	14	2	-11			
	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			
Q	26	2	28	31	23	5	1	15	15	13	4	-11	-9	4	2	-14	-118	-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	-10	-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			
	29	6	6	9	12	17	14	13	13	13	13	11	14	18	11	9	3	0	-2	1	-10	2	6	6	8	8			
	30	6	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	-66	-55	-48	-34	-26	-29	-31	-25	-27	-36			
5Q MEAN		4	3	4	4	5	5	5	5	4	2	-12	-12	3	-2	-2	-4	-9	-8	-4	-7	-5	2	-1	-2	-103			
5D MEAN		-62	-165	-119	-100	-29	-32	-22	-34	-151	-189	-197	-182	-90	-145	-174	-130	-108	-56	-58	-65	-97	-60	-61	-82				

DECEMBER 1970

NO INVOICES

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
0	0	0	7	5	0	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
1	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
2	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
3	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
4	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
5	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
6	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
7	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
8	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
9	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
10	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
11	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
12	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
13	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
14	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
15	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
16	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
17	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
18	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
19	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
20	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
21	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
22	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
23	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
24	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
25	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
26	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
27	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
28	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
29	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
30	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
31	0	0	7	8	5	0	0	0	0	11	11	9	5	5	3	3	7	0	5	0	7	2	2	24
MEAN	-4	-8	-12	-16	-1	-6	-11	-20	-29	-14	-11	-10	-6	-25	-19	-25	-30	-32	-24	-20	-10	-10	-12	-17
50 MEAN	4	5	7	6	0	5	6	6	-5	-10	-7	-12	-16	-15	-10	-11	-15	-17	-13	-11	-7	-7	-7	-7
50 MEAN	-31	-45	-37	-37	-4	-39	-40	-17	-68	-18	-70	-78	-41	-39	-14	-44	-40	-35	-22	-10	-10	-12	-12	-12

JANUARY 1970

 $\Delta U = \text{MAXIMUM DELTA H}$ [illegible]

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

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

IDENTIFICATION			GEOGRAPHIC			GEOMAGNETIC			IDENTIFICATION			GEOGRAPHIC			GEOMAGNETIC		
AI	BM	CC	LAT	LONG	LAT	LONG	LAT	LONG	FC	FC	FC	LAT	LONG	LAT	LONG	LAT	LONG
AI = ABISKO	BM = BARRON	CC = C. CHELYUSKIN	68 21.5	18 49.4	66.0	114.9	FC = FT. CHURCHILL	58 48.0	-94 06.0	68.7	322.8	AI	BM	CC	CC	68.7	322.8
			71 18.2	-156 44.9	68.5	243.1	LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.5						
			77 43.0	104 17.0	66.2	170.4	NAS = MASSARSSUQ	61 06.0	-45 12.0	71.0	391.0						
CC = COLLEGE			64 51.6	-147 50.2	64.6	250.5	TI = TIKSI BAY	71 39.0	129 00.0	60.4	191.4						
GMR = GREAT WHALE R.			55 16.0	-77 47.0	66.5	347.4	UE = CAPE UELLEN	66 09.8	-169 50.1	61.7	237.0						
AI	BM	CC	73 32.6	00 33.7	63.0	161.5											

IDENTIFICATION

GEOMAGNETIC

GEOPHYSIC

IDENTIFICATION

GEOMAGNETIC

GEOPHYSIC

IDENTIFICATION

GEOMAGNETIC

GEOPHYSIC

AI = ABISKO
BM = BARRON
CC = C. CHELYUSKIN
CO = COLLEGE
GMR = GREAT WHALE R.
OI = DIKSON ISLAND

FC = FT. CHURCHILL
LR = LEIRVODUR
NAS = NASSARSSUQ
TI = TIKSI BAY
UE = GAPE UELIN

LAT LONG
58 48.0 -94 06.0
64 11.0 -21 42.0
61 05.0 -45 12.0
71 35.0 129 00.0
66 09.8 -169 50.1

LAT LONG
56.0 114.9
66.5 241.1
66.2 176.4
66.6 256.5
66.5 347.4
63.0 161.5

LAT LONG
68 21.5 18 49.4
71 19.2 -156 44.9
77 43.0 104 17.0
64 51.6 -147 50.2
55 16.0 -77 47.0
73 32.6 00 33.7

LAT LONG
56.0 114.9
66.5 241.1
66.2 176.4
66.6 256.5
66.5 347.4
63.0 161.5

LAT LONG
56.0 114.9
66.5 241.1
66.2 176.4
66.6 256.5
66.5 347.4
63.0 161.5

LAT LONG
56.0 114.9
66.5 241.1
66.2 176.4
66.6 256.5
66.5 347.4
63.0 161.5

LAT LONG
56.0 114.9
66.5 241.1
66.2 176.4
66.6 256.5
66.5 347.4
63.0 161.5

TABLE OF OBSERVATORIES SUPPLYING HOURLY

FEBRUARY 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	BM	BM	BM	CC	LR	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
2	GMR	NAS	FC	BM	BM	BM	CC	CC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
3	FC	GMR	GMR	LR	BM	CC	CC	CC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
4	NAS	NAS	FC	FC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
5	FC	FC	GMR	GMR	BM	BM	NAS	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
6	NAS	NAS	NAS	GMR	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
7	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
8	BM	GMR	GMR	GMR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
9	NAS	DI	GMR	GMR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
10	DI	DI	DI	DI	GMR	DI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
11	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
12	DI	BM	BM	BM	BM	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
13	DI	FC	FC	FC	FC	UE	GMR	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
14	FC	FC	FC	FC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
15	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
16	NAS	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
17	DI	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
18	NAS	GMR	FC	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
19	GMR	GMR	DI	GMR	GMR	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
20	GMR	GMR	GMR	GMR	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
21	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
22	GMR	GMR	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
23	CC	DI	AI	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
24	FC	FC	AI	FC	FC	AI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
25	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
26	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
27	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR
28	GMR	BM	BM	GMR	GMR	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	FC	FC	FC	GMR

IDENTIFICATION

AI = ABISKO

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GEOGRAPHIC

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TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

FEBRUARY 1979		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	LR	GMR	NAS	NAS	NAS	NAS	GMR	AI	GMR	LR	NAS	BM	GMR	GMR	GMR	GMR	GMR	CC	OI	AI	CC
2	CC	CC	TI	FC	FC	NAS	NAS	NAS	FC	FC	FC	FC	FC	CC	CC	BM	FC	FC	FC	FC	FC	AI	AI	AI	CC
3	CC	CC	UE	UE	UE	GMR	NAS	NAS	NAS	FC	FC	FC	FC	CC	CC	BM	FC	FC	FC	FC	FC	UE	AI	AI	UE
4	CC	CC	UE	UE	UE	TI	TI	NAS	GMR	FC	GMR	CC	GMR	FC	FC	BM	BM	BM	BM	BM	BM	AI	AI	AI	CC
5	CC	LR	LR	LR	LR	LR	NAS	TI	NAS	FC	FC	FC	FC	FC	FC	BM	BM	CC	CC	CC	OI	OI	OI	OI	CC
6	CC	UE	UE	UE	UE	AI	NAS	GMR	TI	FC	FC	GMR	GMR	LR	NAS	NAS	GMR	GMR	GMR	CC	CC	TI	TI	TI	CC
7	CC	CC	UE	UE	UE	TI	TI	TI	AI	AI	AI	AI	AI	AI	LR	BM	BM	BM	BM	CC	CC	TI	TI	TI	CC
8	CC	UE	UE	UE	UE	TI	TI	TI	AI	AI	AI	AI	AI	AI	LR	BM	BM	BM	BM	CC	CC	TI	TI	TI	CC
9	UE	CC	UE	UE	UE	TI	TI	NAS	TI	LR	GMR	NAS	AI	AI	LR	NAS	NAS	BM	BM	CC	CC	TI	TI	TI	CC
10	TI	TI	TI	TI	TI	FC	FC	FC	FC	FC	TI	TI	AI	LR	NAS	BM	BM	BM	BM	CC	CC	TI	TI	TI	LR
11	CC	TI	TI	UE	UE	GMR	LR	TI	FC	FC	GMR	AI	LR	LR	NAS	NAS	GMR	FC	BM	CC	CC	CC	CC	CC	CC
12	CC	TI	TI	TI	TI	TI	AI	AI	AI	AI	AI	AI	AI	AI	LR	NAS	GMR	GMR	GMR	CC	CC	CC	CC	CC	CC
13	BM	BM	BM	BM	BM	NAS	FC	AI	AI	AI	AI	AI	AI	AI	LR	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC
14	BM	BM	BM	NAS	LR	NAS	NAS	NAS	GMR	GMR	FC	FC	CC	CC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
15	CC	CC	CC	NAS	NAS	NAS	NAS	NAS	NAS	NAS	GMR	GMR	BM	GMR	DI	BM	CC	CC	CC	CC	CC	CC	CC	CC	AI
16	CC	CC	CC	BM	BM	TI	FC	GMR	FC	FC	FC	FC	CC	CC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC
17	CC	CC	CC	NAS	TI	NAS	TI	NAS	AI	AI	NAS	FC	FC	FC	FC	NAS	GMR	GMR	BM	CC	CC	CC	CC	CC	CC
18	CC	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	GMR	GMR	AI	BM	NAS	CC	BM	FC	GMR	GMR	CC	CC	CC	CC	CC	CC
19	LR	LR	LR	UE	BM	NAS	NAS	NAS	NAS	GMR	GMR	AI	AI	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
20	CC	CC	CC	UE	NAS	NAS	NAS	NAS	NAS	DI	NAS	AI	LR	LR	LR	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC
21	CC	CC	CC	BM	BM	TI	NAS	FC	FC	FC	FC	FC	LR	LR	BM	BM	LR	LR	FC	CC	CC	CC	CC	CC	CC
22	UE	UE	UE	BM	BM	TI	DI	DI	DI	DI	AI	AI	AI	AI	LR	BM	NAS	BM	CC	CC	CC	CC	CC	CC	CC
23	CC	UE	UE	UE	UE	BM	DI	DI	DI	DI	AI	AI	AI	AI	LR	NAS	NAS	NAS	NAS	GMR	GMR	CC	CC	CC	CC
24	CC	NAS	NAS	NAS	NAS	NAS	DI	FC	FC	FC	FC	FC	FC	FC	BM	NAS	NAS	NAS	NAS	FC	FC	CC	CC	CC	CC
25	UE	NAS	NAS	NAS	NAS	NAS	FC	GMR	GMR	DI	AI	AI	AI	LR	NAS	NAS	GMR	GMR	BM	FC	CC	CC	CC	CC	CC
26	UE	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	GMR	GMR	GMR	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
27	UE	UE	UE	UE	UE	TI	NAS	NAS	NAS	NAS	GMR	FC	GMR	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
28	AI	AI	LR	CC	NAS	NAS	FC	NAS	NAS	NAS	NAS	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC

IDENTIFICATION

GEOGRAPHIC

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AI = ABISKO
 BM = BARROW
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GMR = GREAT WHALE R.
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LAT LONG
 68 21.9 15 49.4
 71 18.2 156 46.9
 77 43.6 184 17.0
 64 51.6 147 50.2
 85 16.0 77 47.0
 73 32.6 60 33.7

FC = FT. CHURCHILL
 LR = LEIRVOGUR
 NAS = NASSARSSUQ
 TI = TIKSI BAY
 UE = CAPE UELM

LAT LONG
 58 48.8 -94 06.0
 64 11.0 -71 42.0
 61 06.8 -68 12.0
 71 35.0 129 00.0
 66 09.8 -169 50.1

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

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LAT LONG
 68 21.5 18 49.4
 71 18.2 -356 44.9
 77 43.0 104 17.3
 64 51.6 -147 50.2
 55 16.8 -77 47.0
 73 32.6 68 33.7

FC = FT. CHURCHILL
 LR = LEIRVOGUR
 NAS = NASSARSSUAQ
 TI = TIKSI BAY
 UE = CAPE UELIN

LAT LONG
 58 48.0 -94 06.0
 64 11.0 -21 42.0
 61 06.0 -45 12.0
 71 35.8 129 00.0
 66 09.8 -169 58.1

LAT LONG
 68.7 322.8
 70.2 71.0
 71.0 37.0
 60.4 191.4
 61.7 237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

MARCH		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	CC	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	FC	FC	CO	CO	UE	TI	TI	TI	TI	TI	DI	DI	CC					
2	AI	AI	AI	AI	AI	AI	NAS	NAS	NAS	NAS	GMR	BM	BM	TI	TI	BM	TI	TI	TI	TI	TI	TI	TI	AI					
3	AI	AI	TI	TI	TI	TI	NAS	NAS	DI	BM	GMR	AI	AI	BM	CC	CC	TI	TI	TI	CC	DI	DI	AI	AI					
4	AI	LR	NAS	NAS	NAS	NAS	NAS	NAS	BM	BM	GMR	CO	CO	CO	CO	CO	CO	DI	TI	BM	TI	DI	AI	AI					
5	AI	CC	TI	TI	TI	NAS	GMR	GMR	DI	AI	AI	AI	AI	GMR	GMR	GMR	BM	BM	TI	BM	TI	TI	DI	DI					
6	AI	AI	LR	LR	TI	GMR	LR	GMR	GMR	CO	FC	FC	FC	FC	TI	TI	TI	TI	TI	TI	DI	TI	AI	AI					
7	AI	AI	AI	LR	LR	CO	GMR	NAS	GMR	GMR	GMR	BM	FC	FC	CO	BM	TI	BM	BM	BM	UE	CC	AI	AI					
8	DI	LR	NAS	NAS	NAS	LR	GMR	NAS	NAS	CO	CO	CO	GMR	UE	CO	CO	UE	UE	CO	CO	CO	DI	TI	TI					
9	GMR	LR	NAS	NAS	LR	GMR	GMR	GMR	BM	CO	CO	CO	CO	CO	CO	CO	BM	UE	TI	TI	AI	AI	AI	AI					
10	LR	UE	LR	UE	UE	UE	DI	FC	GMR	FC	FC	BM	BM	DI	GMR	GMR	CC	CC	DI	DI	DI	CC	CO	UE					
11	UE	UE	BM	TI	TI	TI	CC	CC	DI	CC	AI	AI	AI	LR	BM	GMR	GMR	GMR	FC	DI	CC	CC	CC	CC					
12	UE	NAS	NAS	NAS	NAS	NAS	GMR	GMR	BM	CO	GMR	FC	AI	LR	GMR	GMR	BM	GMR	GMR	GMR	DI	CC	CO	UE					
13	UE	UE	UE	TI	TI	TI	TI	GMR	GMR	FC	FC	BM	FC	BM	BM	TI	LR	FC	FC	BM	DI	TI	CO	UE					
14	UE	LR	TI	TI	TI	TI	DI	DI	DI	DI	DI	AI	AI	LR	LR	CC	BM	FC	FC	DI	DI	CC	CO	UE					
15	UE	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	BM	BM	AI	LR	CC	BM	FC	FC	DI	DI	CC	CO	UE					
16	UE	TI	TI	TI	TI	DI	DI	DI	DI	DI	FC	AI	BM	BM	CC	BM	FC	FC	FC	FC	CO	DI	BM	BM					
17	UE	TI	BM	BM	BM	FC	DI	DI	DI	DI	AI	AI	AI	FC	FC	BM	CC	TI	DI	DI	DI	AI	AI	AI					
18	LR	NAS	TI	TI	TI	DI	DI	DI	DI	AI	GMR	FC	AI	FC	FC	BM	CC	TI	DI	DI	DI	AI	AI	AI					
19	LR	TI	NAS	NAS	TI	DI	DI	GMR	GMR	AI	AI	AI	AI	AI	BM	BM	GMR	GMR	DI	DI	DI	DI	AI	AI					
20	LR	TI	TI	TI	TI	DI	DI	DI	DI	AI	AI	AI	AI	FC	BM	GMR	CC	GMR	FC	DI	DI	CC	CC	DI					
21	LR	NAS	NAS	NAS	DI	DI	DI	DI	DI	AI	AI	LR	LR	LR	LR	BM	BM	CC	GMR	CO	CO	CO	CO	CO					
22	UE	UE	TI	TI	TI	DI	DI	FC	AI	AI	BM	LR	LR	LR	BM	GMR	GMR	GMR	DI	DI	CO	CO	CO	CO					
23	UE	UE	TI	TI	TI	DI	DI	DI	DI	GMR	FC	GMR	AI	AI	NAS	BM	BM	BM	BM	DI	CO	CO	CO	CO					
24	UE	UE	UE	UE	CC	CO	DI	DI	DI	AI	AI	AI	AI	LR	LR	GMR	GMR	GMR	FC	FC	CO	CO	CO	CO					
25	UE	UE	UE	TI	TI	DI	DI	DI	FC	AI	AI	AI	AI	LR	LR	LR	GMR	GMR	FC	FC	FC	FC	CO	CO					
26	UE	NAS	NAS	NAS	NAS	DI	DI	DI	DI	AI	AI	AI	AI	FC	AI	LR	GMR	CC	BM	CC	CC	CC	CO	CO					
27	CO	UE	TI	TI	TI	CC	FC	DI	FC	FC	FC	FC	FC	FC	FC	GMR	FC	BM	TI	DI	DI	AI	AI	AI					
28	AI	LR	LR	GMR	LR	GMR	GMR	MAS	GMR	GMR	FC	CO	CO	CO	CO	CO	TI	TI	BM	DI	DI	AI	AI	AI					
29	AI	LR	AI	LR	NAS	NAS	NAS	NAS	GMR	FC	FC	CO	BM	FC	CO	BM	BM	TI	BM	TI	DI	DI	AI	AI					
30	AI	AI	UE	TI	FC	NAS	NAS	NAS	NAS	FC	FC	GMR	GMR	GMR	FC	CO	FC	BM	BM	DI	DI	DI	AI	AI					
31	UE	LR	NAS	LR	NAS	NAS	LR	LR	GMR	GMR	CO	GMR	GMR	CO	UE	CO	FC	BM	FC	TI	AI	AI	AI	AI					
IDENTIFICATION		GEOGRAPHIC				GEOGRAPHIC				GEOGRAPHIC				IDENTIFICATION				GEOGRAPHIC				GEOGRAPHIC				GEOGRAPHIC			
		LAT				LONG				LAT				LONG				LAT				LONG				LAT			
AI = ARISKO		58 21.5				18 49.4				66.8				114.9				FC = FT. CHURCHILL				58 46.0				-94 06.0			
BM = BARRON		71 18.2				-156 44.9				68.5				241.1				LR = LEIRVOGUR				64 11.0				-21 42.0			
CC = C. CHELYSKIN		77 43.8				104 17.0				66.2				176.4				NAS = NASSARSSUAQ				61 06.0				-15 12.0			
CO = COLLEGE		64 51.6				-187 58.2				64.6				266.5				TI = TIKSI BAY				71 35.0				129 00.0			
GMR = GREAT WHALE R.		55 16.0				-77 47.8				66.9				347.4				UE = CAPE UELÉN				66 09.8				-169 58.1			
Y = DIKSON ISLAND		73 32.6				80 33.7				63.0				161.5												61.7			
																										LONG			

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

APRIL	1970	AU = MAXIMUM DELTA H																							
		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
UT		DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
1		DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
2		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
3		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
4		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
5		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
6		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
7		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
8		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
9		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
10		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
11		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
12		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
13		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
14		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
15		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
16		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
17		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
18		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
19		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
20		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
21		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
22		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
23		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
24		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
25		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
26		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
27		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
28		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
29		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
30		FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC

IDENTIFICATION

AI = ABISKD
 BN = BARROW
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GMR = GREAT WHALE R.
 DI = DIKSON ISLAND

GEOGRAPHIC

LAT LONG
 68 21.5 18 49.4
 71 18.2 -156 44.9
 77 43.0 104 17.0
 64 51.6 -147 50.2
 55 16.0 -77 47.0
 73 32.6 66 33.7

IDENTIFICATION

FC = FT. CHURCHILL
 LR = LEIRVOGUR
 NAS = MASSARSSUAQ
 TI = TIKSI BAY
 UE = CAPE VELEN

GEOGRAPHIC

LAT LONG
 56 48.0 -94 06.0
 64 11.0 -21 42.0
 61 06.0 -45 12.0
 71 35.0 129 00.0
 66 09.0 -169 50.1

GEOGRAPHIC

LAT LONG
 58.7 322.8
 70.2 71.0
 71.0 37.0
 68.4 191.4
 61.7 237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

APRIL 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

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

AI = ABISKO
 BM = BARKON
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GMR = GREAT WHALE R.
 DI = DIKSON ISLAND

AT = 21.5
 71 18.2
 77 43.0
 64 51.6
 55 16.0
 73 32.6

LONG 18 49.4
 -156 44.9
 104 17.8
 -147 50.2
 -77 47.0
 80 33.7

LAT 66.0
 68.5
 66.2
 64.6
 66.5
 63.0

LONG 114.9
 241.1
 176.4
 256.5
 347.4
 161.5

FC = FT. CHURCHILL
 LR = LEIRVOGUR
 NAS = NASSARSSUAQ
 TI = TIKSI BAY
 UE = CAPE VELEN

58 48.8
 64 11.0
 61 06.0
 71 35.8
 66 09.0

LONG -96 06.8
 -21 42.0
 -45 12.0
 129 00.0
 -169 50.1

LAT 58.7
 70.2
 71.0
 60.4
 61.7

LONG 322.8
 71.0
 37.8
 191.0
 237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

MAY	UT	1970												AL = MINIMUM DELTA H											
		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	UE	TI	TI	TI	TI	LR	GHR	GHR	GHR	AI	AI	FC	CO	BM	BM	BM	FC	BM	TI	DI	DI	AI	AI
	2	AI	LR	TI	TI	TI	TI	LR	NAS	NAS	NAS	FC	FC	FC	NAS	FC	BM	FC	BM	DI	DI	CO	UE	AI	LR
	3	LR	TI	TI	TI	TI	TI	AI	AI	AI	AI	AI	AI	CO	BM	FC	FC	BM	BM	BM	DI	DI	AI	AI	AI
	4	LR	TI	TI	TI	TI	TI	AI	AI	AI	AI	AI	AI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	5	LR	LR	TI	TI	TI	TI	AI	AI	AI	AI	AI	AI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	6	AI	TI	TI	TI	TI	TI	CC	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	7	CO	TI	TI	TI	TI	TI	CC	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	8	TI	NAS	TI	TI	TI	TI	CC	CC	DI	AI	AI	AI	LR	NAS	NAS	GHR	GHR	BM	BM	DI	DI	CO	UE	UE
	9	NAS	NAS	NAS	NAS	NAS	NAS	GHR	GHR	NAS	GHR	LR	LR	LR	NAS	NAS	NAS	GHR	BM	BM	DI	DI	CO	UE	UE
	10	UE	TI	TI	TI	TI	TI	NAS	NAS	DI	FC	FC	FC	FC	LR	LR	LR	GHR	GHR	CO	CO	CO	CO	CO	CO
	11	CO	UE	TI	TI	TI	TI	CC	DI	DI	LR	LR	LR	LR	LR	LR	LR	NAS	GHR	FC	FC	UE	CC	CC	LR
	12	LR	LR	LR	LR	LR	LR	NAS	NAS	DI	DI	LR	LR	LR	LR	LR	LR	FC	CO	BM	TI	DI	CC	CC	CC
	13	LR	LR	LR	LR	LR	LR	NAS	NAS	DI	DI	LR	LR	LR	LR	LR	LR	GHR	GHR	BM	TI	DI	UE	CC	CC
	14	LR	LR	LR	LR	LR	LR	LR	NAS	NAS	LR	LR	LR	LR	LR	LR	LR	FC	BM	BM	BM	TI	TI	CC	DI
	15	LR	LR	LR	LR	LR	LR	CO	TI	NAS	GHR	GHR	GHR	FC	NAS	BM	BM	TI	BM	BM	DI	DI	TI	TI	TI
	16	LR	TI	TI	TI	TI	TI	TI	NAS	GHR	NAS	GHR	FC	LR	GHR	FC	BM	BM	BM	DI	DI	TI	TI	UE	LR
	17	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	LR	AI	LR	LR	GHR	GHR	FC	GHR	TI	BM	CO	BM	UE	UE	AI
	18	CC	LR	LR	LR	LR	LR	CC	DI	CC	LR	AI	LR	LR	LR	GHR	BM	BM	DI	DI	CO	CO	CO	UE	LR
	19	TI	TI	TI	TI	TI	TI	LR	GHR	GHR	GHR	GHR	FC	FC	FC	LR	GHR	BM	BM	FC	FC	DI	FC	FC	LR
	20	FC	FC	FC	FC	FC	FC	LR	NAS	GHR	NAS	GHR	GHR	FC	CO	BM	CO	BM	BM	BM	TI	DI	DI	CC	CC
	21	CC	FC	FC	FC	FC	FC	FC	FC	FC	FC	GHR	GHR	GHR	BM	CO	BM	BM	BM	DI	DI	TI	CC	CC	LR
	22	LR	LR	LR	LR	LR	LR	NAS	GHR	GHR	NAS	LR	NAS	FC	FC	NAS	BM	BM	BM	BM	BM	CC	DI	DI	CC
	23	TI	TI	TI	TI	TI	TI	TI	GHR	DI	NAS	GHR	FC	FC	FC	NAS	BM	BM	BM	BM	BM	CC	DI	DI	CC
	24	CC	LR	TI	TI	TI	TI	NAS	GHR	BM	AI	GHR	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	25	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	BM	DI	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	26	TI	BM	TI	TI	TI	TI	BM	BM	DI	AI	AI	AI	AI	AI	LR	FC	BM	BM	BM	BM	BM	FC	FC	FC
	27	TI	TI	TI	TI	TI	TI	NAS	NAS	NAS	GHR	GHR	AI	NAS	FC	BM	BM	BM	BM	BM	BM	BM	FC	FC	FC
	28	AI	AI	AI	AI	AI	AI	LR	CO	UE	DI	GHR	NAS	NAS	GHR	GHR	CO	UE	FC	TI	TI	AI	AI	AI	AI
	29	AI	LR	LR	LR	LR	LR	CC	GHR	GHR	LR	GHR	NAS	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
	30	AI	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
	31	LR	TI	BM	TI	TI	TI	NAS	GHR	NAS	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC

IDENTIFICATION

GEOGRAPHIC

GEOGRAPHIC

IDENTIFICATION

GEOGRAPHIC

GEOGRAPHIC

AI = ABISKO

BM = BARRON

CC = C. CHELYUSKIN

CO = COLLEGE

GHR = GREAT WHALE R.

DI = DIKSON ISLAND

FC = FT. CHURCHILL

LR = LEIRVOGUR

NAS = NASSAESSURQ

TI = TIKSI BAY

UE = CAPE VELEN

LAT

LONG

LAT

LONG

LAT

LONG

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

JUNE		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	BM	BM	BM	BM	CO	LR	CC	CC	YI	YI	CC	DI	AI	AI	LR	LR	LR	NAS	NAS	GHR	FC	FC																																																																																			
2	FC	FC	BM	BM	BM	BM	YI	YI	YI	YI	CC	CC	CC	DI	DI	LR	LR	LR	LR	LR	NAS	NAS	FC	FC																																																																																			
3	FC	FC	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	DI	AI	AI	LR	LR	LR	NAS	NAS	FC	FC																																																																																				
4	FC	FC	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	GHR	YI	YI	AI	AI	AI	LR	LR	GHR	DI	DI																																																																																			
5	FC	NAS	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC																																																																																			
6	FC	FC	FC	FC	FC	FC	CO	CO	CC	CC	CC	YI	CC	CC	CC	CC	NAS	LR	LR	LR	LR	GHR	GHR	DI																																																																																			
7	AI	FC	FC	FC	FC	FC	GHR	UE	YI	YI	CC	YI	YI	YI	CC	DI	DI	LR	LR	NAS	GHR	GHR	GHR	GHR																																																																																			
8	FC	FC	FC	FC	FC	FC	CO	CC	YI	LR	CC	YI	YI	YI	CC	LR	NAS	NAS	NAS	NAS	FC	FC	GHR	FC																																																																																			
9	FC	FC	FC	FC	FC	FC	FC	UE	UE	UE	YI	YI	YI	YI	LR	LR	NAS	NAS	NAS	NAS	FC	FC	GHR	FC																																																																																			
10	FC	FC	GHR	FC	FC	FC	UE	CC	CC	CC	CC	YI	YI	YI	CC	AI	LR	NAS	NAS	NAS	NAS	DI	DI	FC																																																																																			
11	FC	FC	FC	FC	AI	AI	UE	YI	YI	YI	YI	CC	CC	YI	YI	LR	NAS	NAS	NAS	NAS	DI	DI	DI	DI																																																																																			
12	FC	FC	FC	FC	FC	FC	CC	YI	CC	YI	CC	CC	CC	CC	CC	LR	LR	NAS	NAS	NAS	NAS	FC	FC	GHR																																																																																			
13	FC	FC	FC	FC	GHR	GHR	UE	CC	CC	DI	DI	AI	AI	AI	AI	AI	NAS	NAS	NAS	NAS	FC	FC	FC	GHR																																																																																			
14	FC	FC	FC	FC	CC	CC	UE	CC	GHR	GHR	YI	YI	YI	YI	YI	AI	LR	LR	NAS	NAS	NAS	NAS	FC	FC																																																																																			
15	FC	FC	FC	FC	CC	CC	CO	CO	CC	YI	YI	DI	DI	DI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC																																																																																			
16	FC	GHR	CO	GHR	CO	CO	CC	CC	LR	GHR	YI	YI	YI	YI	AI	DI	LR	LR	NAS	NAS	NAS	NAS	GHR	GHR																																																																																			
17	FC	DI	AI	AI	AI	UE	UE	UE	CC	YI	YI	CC	AI	AI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	GHR	GHR																																																																																			
18	FC	GHR	DI	DI	AI	CO	CC	CC	DI	DI	DI	AI	AI	AI	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC																																																																																			
19	FC	GHR	FC	FC	AI	CO	CO	CO	YI	CC	CC	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC																																																																																			
20	GHR	FC	CO	CO	CO	CO	CO	YI	DI	DI	DI	DI	DI	AI	AI	LR	LR	LR	GHR	GHR	GHR	GHR	GHR	GHR																																																																																			
21	GHR	UE	FC	UE	UE	UE	YI	DI	DI	DI	DI	DI	DI	AI	AI	LR	LR	LR	NAS	CO	LR	NAS	FC	FC																																																																																			
22	FC	FC	FC	GHR	AI	LR	LR	YI	YI	CC	CC	CC	CC	CC	CC	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	FC																																																																																			
23	FC	GHR	GHR	CO	CO	CO	CO	UE	UE	UE	UE	CC	CC	CC	DI	DI	DI	DI	NAS	NAS	NAS	NAS	NAS	FC																																																																																			
24	FC	FC	FC	AI	AI	AI	DI	DI	UE	UE	UE	CC	CC	CC	DI	AI	AI	AI	LR	LR	NAS	NAS	FC	FC																																																																																			
25	FC	FC	FC	AI	AI	AI	CO	CO	CC	CC	CC	CC	CC	DI	AI	AI	AI	AI	LR	LR	NAS	FC	FC	FC																																																																																			
26	DI	FC	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	CC	CC	CC	CC	AI	LR	LR	LR	NAS	NAS	NAS	NAS	FC	DI																																																																																			
27	FC	FC	FC	CO	CO	CO	CO	DI	DI	DI	DI	AI	AI	AI	AI	AI	NAS	NAS	LR	LR	NAS	NAS	NAS	FC																																																																																			
28	FC	FC	CO	CO	CO	CO	CO	YI	CC	CC	CC	CC	CC	CC	AI	AI	AI	AI	CO	NAS	NAS	NAS	NAS	FC																																																																																			
29	FC	AI	AI	AI	AI	CO	CO	CO	CC	UE	YI	CC	CC	CC	YI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	FC																																																																																			
30	DI	DI	AI	AI	AI	AI	CO	CO	CC	CC	CC	CC	CC	CC	CC	CC	LR	LR	LR	LR	FC	FC	FC	FC																																																																																			
IDENTIFICATION												GEOGRAPHIC												GEOGRAPHIC												GEOGRAPHIC																																																																							
LAT												LONG												LAT												LONG												LAT												LONG																																															
60 21.5												18 49.4												66.0												114.9												50 46.0												-94 66.0												66.7												322.8																							
71 18.2												-156 44.5												68.5												241.1												64 11.0												-21 42.0												70.2												71.0																							
77 43.0												104 17.0												66.2												176.4												61 06.0												-55 12.0												71.0												37.0																							
64 51.6												-147 50.2												64.6												266.5												71 35.0												169 00.8												60.4												191.4																							
GHR = GREAT WHALE R.												55 16.0												-77 47.0												65.5												347.6												66 09.8												-169 52.1												61.7												237.0											
I I = DIKSON ISLAND												73 32.6												80 33.7												63.0												161.5																																																											

AI = ABISKO	68 21.5	18 49.4	66.0	114.9	FC = FT. CHURCHILL	58 46.0	-94 06.0	66.7	322.8
BM = BARRON	71 18.2	-156 44.5	68.5	241.1	LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0
CC = C. CHELYUSKIN	77 43.0	104 17.0	66.2	176.4	NAS = NASSARSURQ	61 06.0	-45 12.0	71.0	37.0
CO = COLLEGE	64 51.6	-147 50.2	64.6	266.5	TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4
GWR = GREAT WHALE R.	55 16.0	-77 47.0	65.5	387.6	UE = CAPE ULEH	66 09.8	-169 50.1	61.7	237.0
DI = DIKSON ISLAND	73 32.6	80 33.7	63.0	161.5					

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

JUNE		1970																								AL = MINIMUM DELTA H			
UY		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	LR	NAS	NAS	NAS	DI	DI	GMR	GMR	GMR	FC	CC	GMR	CC	CO	FC	DI	BM	BM	DI	DI	DI	CC			
2	LR	LR	LR	LR	LR	NAS	NAS	NAS	GMR	CC	DI	AI	BM	LR	FC	BM	CC	FC	FC	BM	FC	DI	CC	DI	CC	DI			
3	CC	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	FC	FC	FC	CC	FC	FC	CC	CC	CC	CC	CC	CC	CC			
4	AI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	FC	FC	CC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC			
5	CC	TI	NAS	LR	LR	NAS	NAS	NAS	NAS	NAS	GMR	GMR	CC	CC	FC	AI	GMR	FC	FC	FC	DI	UE	UE	CC	UE	TI			
6	TI	TI	TI	CC	NAS	NAS	NAS	NAS	GMR	GMR	LR	FC	AI	NAS	NAS	NAS	CC	CC	CC	DI	CC	CC	CC	CC	CC	CC			
7	TI	TI	TI	CC	NAS	CC	DI	DI	AI	AI	FC	LR	NAS	NAS	NAS	GMR	GMR	FC	FC	CC	DI	TI	TI	AI	DI	CC			
8	LR	LR	LR	LR	LR	LR	LR	NAS	GMR	DI	GMR	FC	CC	FC	FC	FC	FC	FC	CC	CC	DI	CC	CC	CC	CC	CC			
9	LR	LR	LR	LR	LR	NAS	NAS	CC	CC	NAS	GMR	FC	AI	LR	GMR	GMR	GMR	FC	CC	CC	CC	CC	CC	CC	CC	CC			
10	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	GMR	FC	FC	FC	NAS	FC	CC	FC	CC	CC	CC	DI	DI	DI	CC	CC	TI			
11	LR	LR	LR	LR	LR	NAS	CC	DI	NAS	GMR	GMR	LR	LR	NAS	NAS	FC	GMR	FC	FC	CC	CC	CC	CC	CC	CC	UE			
12	TI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	FC	FC	FC	FC	FC	GMR	FC	FC	CC	DI	DI	DI	CC	CC	CC			
13	CC	TI	TI	TI	TI	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	GMR	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC			
14	LP	LR	LR	LR	LR	LR	NAS	NAS	DI	CC	DI	AI	LR	LR	LR	NAS	NAS	GMR	GMR	CC	CC	CC	CC	CC	CC	CC			
15	LR	LR	LR	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC			
16	AI	LR	LR	LR	LR	LR	LR	LR	LR	NAS	DI	DI	AI	AI	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	AI			
17	LR	UE	TI	TI	TI	TI	TI	NAS	DI	FC	DI	AI	NAS	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI			
18	AI	AI	AI	TI	TI	TI	TI	NAS	GMR	NAS	NAS	GMR	GMR	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	AI			
19	AI	AI	AI	LR	LR	LR	LR	NAS	NAS	GMR	NAS	GMR	GMR	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	AI			
20	DI	AI	AI	AI	AI	LR	LR	LR	LR	LR	NAS	NAS	NAS	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI			
21	DI	AI	AI	AI	AI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI			
22	LR	LR	LR	LR	LR	NAS	CC	CC	DI	DI	AI	AI	FC	FC	FC	NAS	FC	FC	FC	FC	FC	CC	CC	CC	CC	AI			
23	CC	LR	LR	LR	LR	NAS	NAS	NAS	CC	AI	AI	AI	FC	NAS	NAS	GMR	FC	FC	FC	FC	CC	CC	CC	CC	CC	AI			
24	TI	LR	LR	LR	LR	GMR	GMR	GMR	CC	GMR	GMR	DI	AI	AI	NAS	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	AI			
25	AI	AI	AI	CC	TI	CC	TI	CC	GMR	GMR	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	AI			
26	TI	TI	TI	TI	TI	LR	LR	LR	GMR	GMR	GMR	GMR	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI			
27	LR	LR	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI			
28	TI	LR	LR	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	AI			
29	LR	TI	TI	TI	TI	CC	CC	CC	FC	GMR	GMR	LR	FC	LR	LR	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	AI			
30	UE	UE	TI	TI	TI	CC	CC	CC	GMR	GMR	GMR	GMR	FC	FC	AI	DI	FC	FC	FC	CC	CC	CC	CC	CC	CC	AI			
IDENTIFICATION		IDENTIFICATION																								GEOMAGNETIC			
		LAT LONG																								LAT LONG			
		68 21.5 18 49.4 66.0 114.9																								58 48.0 -94 06.0		66.7 325.8	
		71 18.2 -156 46.9 66.5 241.1																								64 11.0 -20 42.0		79.2 71.0	
		77 43.0 104 17.0 66.2 176.4																								61 06.0 -46 12.0		71.0 191.4	
		64 51.6 -147 50.2 64.6 256.5																								71 35.0 -129 00.0		60.4 191.4	
		55 16.0 -77 47.0 66.5 347.4																								66 09.8 -165 50.1		61.7 237.0	
		73 32.6 60 33.7 63.0 161.5																											
		FC = FT CHURCHILL																											
		LR = LEIRVOGUR																											
		NAS = NASSARSSUAQ																											
		TI = TIKSI BAY																											
		UE = CAPE UELÉN																											
		DI = DIKSON ISLAND																											

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

JULY		AU = MAXIMUM DELTA H																																																																															
UT	31	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	FC	CO	CO	CO	CO	TI	CC	FC	CC	CC	AI	DI	AI	LR	GMR	LR	LR	LR	LR	LR	FC	FC																																																								
2	FC	FC	FC	FC	CO	CO	CO	CO	CC	CC	CC	DI	CC	CC	CC	AI	LR	LR	CO	AI	LR	LR	LR	FC	FC																																																								
3	FC	FC	FC	FC	CO	CO	CO	CO	DI	DI	DI	DI	CC	CC	CC	CO	CO	NAS	NAS	NAS	FC	FC	GMR	GMR																																																									
4	CO	FC	FC	FC	CO	CO	CO	CO	CC	CC	CC	CC	CC	DI	TI	LR	AI	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	CO	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	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC	FC																																																									
8	FC	FC	GM	GM	GM	GM	GM	GM	CC	CC	CC	CC	CC	CC	AI	LR	LR	LR	NAS	NAS	GMR	GMR	GMR	GMR																																																									
9	FC	FC	GM	GM	CO	CO	CO	UE	DI	DI	DI	DI	AI	AI	AI	LR	LR	LR	NAS	GMR	FC	FC	GM	GM																																																									
10	GM	GM	GM	AI	AI	AI	PH	PH	GM	GM	CC	CC	CC	CC	GM	AI	AI	LR	NAS	LR	GMR	FC	FC	GMR																																																									
11	FC	GM	GMR	FC	AI	GM	PH	PH	CC	CC	CC	CC	DI	DI	TI	LR	LR	LR	NAS	NAS	NAS	FC	FC	FC																																																									
12	FC	GM	GM	GM	GM	GM	GM	GM	CC	CC	CC	CC	CC	DI	DI	AI	LR	NAS	NAS	NAS	NAS	FC	FC	FC																																																									
13	FC	FC	FC	GM	GM	GM	GM	GM	GMR	GMR	CC	CC	CC	CC	CC	AI	AI	LR	NAS	NAS	NAS	GMR	DI	DI																																																									
14	FC	FC	CO	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CO	CO	LR	NAS	NAS	NAS	NAS	FC	FC																																																									
15	FC	FC	GMR	AI	GMR	UE	TI	TI	GM	CC	CC	CC	CC	CC	DI	DI	DI	DI	DI	DI	LR	NAS	NAS	FC																																																									
16	FC	FC	FC	GM	GM	GM	GMR	TI	TI	TI	TI	CC	DI	DI	DI	CC	LR	LR	NAS	NAS	LR	NAS	DI	DI																																																									
17	DI	FC	GM	FC	LR	UE	UE	GM	TI	TI	TI	CC	CC	CC	DI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC																																																									
18	FC	FC	FC	FC	GM	GM	GM	GM	TI	TI	TI	CC	CC	CC	CC	CC	CC	LR	LR	LR	NAS	NAS	FC	NAS																																																									
19	NAS	DI	FC	GM	GM	GM	GM	GM	GM	CC	CC	CC	CC	CC	CC	AI	LR	LR	LR	NAS	NAS	NAS	FC	NAS																																																									
20	FC	FC	FC	FC	AI	AI	GM	GM	GM	GM	GM	CC	CC	CC	CC	DI	LR	LR	LR	NAS	NAS	NAS	FC	GMR																																																									
21	GMR	FC	GM	GM	PH	AI	LR	GMR	CC	CC	CC	DI	DI	AI	AI	LR	LR	LR	NAS	GMR	GMR	GMR	FC	FC																																																									
22	GMR	GMR	FC	GM	GM	GM	GM	GM	CC	CC	CC	CC	CC	CC	CC	LR	LR	LR	NAS	NAS	FC	FC	FC	NAS																																																									
23	FC	FC	GM	GM	AI	GM	AI	GM	CC	CC	CC	CC	CC	CC	CC	LR	LR	NAS	NAS	NAS	AI	DI	NAS	NAS																																																									
24	FC	FC	GM	CO	CO	CO	TI	GM	LR	GMR	CC	CC	CC	DI	DI	AI	LR	LR	LR	NAS	NAS	NAS	FC	FC																																																									
25	FC	FC	CO	GM	GM	CO	TI	TI	TI	AI	AI	AI	AI	AI	AI	CC	CC	CC	GM	NAS	FC	GMR	GMR	CO																																																									
26	CO	CO	CO	GM	GM	GM	PH	GM	CC	DI	DI	DI	DI	DI	AI	LR	NAS	NAS	NAS	NAS	NAS	FC	GMR	GMR																																																									
27	FC	DI	FC	GM	GM	GM	TI	CC	CC	CC	CC	CC	CC	CC	CC	LR	LR	LR	GMR	GMR	NAS	FC	FC	FC																																																									
28	FC	DI	DI	AI	AI	AI	LR	LR	GM	GM	GM	CC	TI	CC	TI	CC	CC	NAS	NAS	NAS	NAS	NAS	FC	FC																																																									
29	FC	FC	GM	GM	CO	CO	CO	CO	DI	DI	DI	AI	AI	AI	AI	AI	LR	NAS	LR	NAS	GM	DI	DI	DI																																																									
30	DI	DI	GMR	FC	GM	GM	GM	CC	GM	CC	CC	CC	CC	CC	CC	CC	CC	CC	LR	LR	NAS	NAS	FC	FC																																																									
31	FC	FC	FC	GM	GM	GM	GM	CC	CC	CC	CC	CC	CC	CC	LR	LR	AI	NAS	NAS	NAS	NAS	FC	GMR	FC																																																									
IDENTIFICATION		GEOGRAPHIC										GEOMAGNETIC										IDENTIFICATION										GEOGRAPHIC										GEOMAGNETIC																																							
AI = AJISKO		LAT										LONG										LAT										LONG										LAT										LONG																													
GM = NARROW		68 21.5										18 49.4										56.0										114.9										58 46.0										-94 06.0										68.7										322.8									
CC = C. CHELYUSKIN		77 43.0										104 17.0										66.2										176.4										64 11.0										-21 42.0										78.2										71.0									
CO = COLLEGE		64 51.6										-147 50.2										54.6										256.5										61 06.0										-45 15.0										71.0										37.0									
GMR = GREAT WHALE R.		55 16.0										-77 47.0										66.5										147.4										71 35.0										129 00.0										60.4										191.4									
TI = DIKSON ISLAND		73 32.6										80 33.7										63.0										161.5										66 09.0										-164 50.1										61.7										237.0									

IDENTIFICATION	GEOGRAPHIC		GEOMAGNETIC		IDENTIFICATION		GEOGRAPHIC		GEOMAGNETIC	
	LAT	LONG	LAT	LONG			LAT	LONG	LAT	LONG
AI = AITSKO	68 21.5	18 49.4	56.0	114.9	FC = FT CHURCHILL	58 48.0	-94 06.0	68.7	222.8	
BN = BARRON	71 15.2	-156 44.9	68.5	241.1	LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0	
CC = C. CHELYUSKIN	77 43.0	104 17.0	66.2	176.4	NAS = NASSARSUAQ	61 06.0	-45 12.0	71.0	37.0	
CO = COLLEGE	64 51.6	-147 50.2	54.6	256.5	TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4	
GMR = GREAT WHALE R.	55 16.0	-77 47.0	66.5	147.4	UE = CAPE UELÉN	68 09.8	-168 50.1	61.7	237.0	
DI = DIKSON ISLAND	73 32.6	80 33.2	63.0	161.5						

TABLE OF OBSERVATOIRES SUPPLYING HOURLY AL

[illegible]

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

AUGUST	1970	AU = MAXIMUM DELTA H																							
		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	FC	GHR	RM	NAS	NAS	NAS	RM	CC	NAS	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
2	FC	FC	FC	FC	FC	RM	RM	RM	RM	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
3	DI	DI	DI	DI	FC	GHR	GHR	GHR	GHR	FC	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
4	FC	GHR	RM	FC	FC	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
5	FC	FC	FC	FC	FC	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
6	DI	DI	DI	DI	AI	AI	CO	FC	RM	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
7	FC	FC	FC	GHR	GHR	UE	LR	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM
8	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	CC	DI	UE	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI
9	GHR	CO	CO	CO	CO	CO	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
10	DI	GHR	RM	RM	RM	RM	RM	RM	RM	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
11	FC	GHR	RM	RM	RM	RM	RM	RM	RM	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
12	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
13	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
14	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
15	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
16	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
17	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
18	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
19	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
20	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
21	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
22	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
23	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
24	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
25	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
26	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
27	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
28	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
29	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
30	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	RM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
31	FC	DI	LR	LR	LR	RM	RM	CO	CO	TI	TI	CC	CC	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI

IDENTIFICATION	GEOGRAPHIC			GEOGRAPHIC			IDENTIFICATION			GEOGRAPHIC			GEOGRAPHIC		
	LAT	LONG	LOJG	LAT	LONG	LOJG	LAT	LONG	LOJG	LAT	LONG	LOJG	LAT	LONG	LOJG
AI = A1SKO	68 21.5	18 49.4	56.0	68 21.5	18 49.4	56.0	FC = FT. CHURCHILL	58 49.0	-94 06.0	58.7	322.0	58.7	322.0	58.7	322.0
RM = BARRON	71 18.2	-155 49.9	68.5	71 18.2	-155 49.9	68.5	LR = LEIRVOGUR	64 11.0	-21 42.0	70.2	71.0	71.0	71.0	71.0	71.0
CC = C. CH. LYSKIN	77 43.0	104 17.0	66.2	77 43.0	104 17.0	66.2	NAS = NASSARSSUAQ	61 06.0	-45 12.0	71.0	37.0	71.0	37.0	71.0	37.0
CO = COLLEGE	64 51.5	-147 53.2	64.6	64 51.5	-147 53.2	64.6	TI = TIKSI BAY	71 35.0	129 00.0	60.4	191.4	60.4	191.4	60.4	191.4
GHR = GREAT WHALE R.	55 16.0	-77 47.0	66.5	55 16.0	-77 47.0	66.5	UE = CAPE UELLEN	66 09.0	-169 50.1	61.7	237.0	61.7	237.0	61.7	237.0
DI = DIKSON ISLAND	73 32.6	40 33.7	62.0	73 32.6	40 33.7	62.0									

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

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

IDENTIFICATION

IDENTIFICATION

GEOGRAPHIC

GEOGRAPHIC

AT = ABISKO
 BM = RAPROU
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GMP = GREAT WHALE R.
 DI = DIKSON ISLAND

FC = FT. CHURCHILL
 LR = LEIRVOGUR
 NAS = NASSARSSUAQ
 TI = TIKSTI BAY
 UE = CAPE UELIN

LAT LONG
 68 21.5 18 49.4
 71 18.2 -156 44.9
 77 43.0 104 17.0
 84 51.6 -147 50.2
 86 16.0 -77 47.0
 73 32.6 82 33.7

LAT LONG
 58 48.0 -94 06.0
 64 11.0 -21 42.0
 61 06.0 -45 12.0
 71 35.8 129 00.0
 86 09.8 -169 50.1

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

SEPTEMBER 1970		AU = MAXIMUM DELTA M																							
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	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
2	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
3	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
4	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
5	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
6	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
7	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
8	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
9	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
10	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
11	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
12	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
13	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
14	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
15	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
16	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
17	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
18	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
19	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
20	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
21	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
22	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
23	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
24	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
25	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
26	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
27	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
28	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
29	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI
30	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
31	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI	DI

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

SEPTEMBER 1979		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	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
2	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
3	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
4	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
5	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
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7	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
8	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
9	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
10	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
11	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
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15	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
16	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
17	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
18	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
19	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
20	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
21	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
22	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
23	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
24	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
25	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
26	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
27	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
28	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
29	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP
30	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

IDENTIFICATION		GEOGRAPHIC		GEOGRAPHIC		IDENTIFICATION		GEOGRAPHIC		GEOGRAPHIC		GEOGRAPHIC	
		LAT	LONG	LAT	LONG			LAT	LONG	LAT	LONG	LAT	LONG
AI = ARIZKO		68 21.5	18 49.4	68.0	114.9	FC = FT. CHURCHILL		58 48.0	-94 06.0	68.7	322.8		
BM = BARPOH		71 18.2	-156 44.9	68.5	243.1	LR = LEIRVOGUR		64 11.0	-21 42.0	70.2	71.0		
CC = C. CHELYUSKIN		77 43.0	104 17.0	66.2	176.4	NAS = NASSARSSUAQ		61 06.0	-45 12.0	71.0	37.0		
CD = COLLEGE		64 51.6	-147 40.2	64.5	256.5	TI = TIKSI BAY		71 35.0	129 00.0	68.4	191.4		
GMR = GREAT WHALE P.		58 16.0	-77 42.0	66.5	747.4	UE = CAPE UELLEN		66 39.4	-169 50.1	61.7	237.0		
DI = DIKSON ISLAND		73 32.6	80 33.7	67.0	161.5								

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

OCTOBER		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	BM	BM	BM	BM	BM	BM	BM	BM	CC	CC	DI	DI	DI	NAS	NAS	NAS	NAS	LR	NAS	FC	GMR											
2	BM	GMR	GMR	NAS	NAS	BM	BM	BM	CC	CC	CC	CC	CC	DI	DI	DI	CC	NAS	LR	NAS	LR	NAS	NAS	FC											
3	GMR	GMR	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	DI	DI	DI	AI	NAS	NAS	NAS	NAS	GMR	GMR	FC											
4	GMR	GMR	BM	CO	CO	BM	BM	UE	CC	CC	CC	CC	CC	DI	DI	DI	AI	NAS	NAS	NAS	FC	NAS	FC	NAS											
5	GMR	GMR	GMR	GMR	GMR	BM	CO	BM	CO	CC	GMR	CC	CC	CC	DI	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS											
6	FC	FC	FC	FC	FC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	NAS	NAS	NAS	NAS	FC	NAS	NAS											
7	DI	LR	FC	GMR	GMR	FC	FC	FC	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	NAS	LR	NAS	NAS	NAS	NAS											
8	NAS	FC	GMR	GMR	FC	FC	FC	FC	BM	BM	BM	CC	CC	CC	CC	CC	UE	DI	NAS	LR	NAS	NAS	NAS	NAS											
9	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	AT	BM	BM	CC	CC	CC	CC	CC	TI	LR	NAS	NAS	NAS	GMR	CC	LR											
10	LR	LR	LR	GMR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	NAS	AT	LR	LR	GMR	GMR	GMR											
11	GMR	GMR	BM	BM	BM	CO	UE	TI	DI	DI	DI	DI	DI	DI	DI	DI	AI	LR	NAS	NAS	NAS	BM	FC	FC											
12	BM	CO	BM	CO	UE	CC	CC	CC	TI	UE	TI	CC	CC	CC	CC	CC	CO	LR	NAS	NAS	NAS	NAS	NAS	NAS											
13	NAS	NAS	NAS	NAS	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS											
14	FC	BM	BM	BM	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	NAS	NAS	NAS	FC	FC	FC											
15	FC	FC	FC	FC	GMR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	CO	TI	AI	LR	NAS	NAS	DI											
16	DI	DI	DI	DI	AI	AI	AI	BM	CC	CC	CC	CC	CC	CC	CC	CC	AI	FC	CC	GMR	FC	FC	FC	FC											
17	FC	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	LR	LR	GMR	GMR	GMR	CC	CC											
18	CO	UE	CO	UE	LR	LR	LR	LR	TI	TI	CC	CC	CC	CC	CC	CC	AI	LR	NAS	NAS	NAS	GMR	FC	NAS											
19	FC	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	NAS	NAS	NAS	NAS	NAS	NAS											
20	FC	FC	FC	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	AI	NAS	NAS	NAS	NAS	NAS	NAS											
21	NAS	BM	BM	FC	BM	BM	LR	BM	BM	BM	CC	CC	CC	CC	CC	CC	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC											
22	GMR	FC	GMR	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	LR	LR	GMR	GMR	GMR	BM	CC											
23	CO	BM	BM	BM	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	NAS	NAS	NAS	GMR	FC	NAS											
24	BM	GMR	BM	BM	BM	CC	UE	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	NAS	NAS	NAS	NAS	NAS	FC											
25	BM	GMR	GMR	BM	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	LR	BM	NAS	NAS	CC	CC											
26	GMR	GMR	GMR	GMR	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	NAS	NAS	NAS	LR	BM	NAS	NAS											
27	GMR	NAS	GMR	GMR	GMR	GMR	GMR	GMR	GMR	GMR	GMR	CC	CC	CC	CC	CC	DI	DI	TI	GMR	NAS	GMR	NAS	NAS											
28	NAS	GMR	GMR	GMR	BM	BM	CO	CC	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	NAS	NAS	GMR	GMR	BM	CC											
29	BM	DI	DI	GMR	GMR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	DI	NAS	LR	NAS	GMR	GMR	FC	CC											
30	GMR	BM	BM	BM	BM	LR	GMR	BM	CC	CC	CC	CC	CC	CC	CC	CC	AI	NAS	DI	DI	LR	NAS	GMR	GMR											
31	GMR	GMR	GMR	GMR	GMR	GMR	GMR	BM	CC	CC	CC	CC	CC	CC	CC	CC	DI	DI	GMR	NAS	GMR	GMR	GMR	GMR											
IDENTIFICATION				GEOGRAPHIC				GEOMAGNETIC				IDENTIFICATION				GEOGRAPHIC				GEOMAGNETIC															
				LAT				LONG				LAT				LONG				LAT				LONG											
AI = ADISKO				68 21.5				18 49.4				60.0				114.9				58 44.0				-94 06.0				60.7				372.0			
BM = DARROW				71 18.2				-156 44.9				68.5				241.1				61 11.0				-21 42.9				70.2				71.9			
C = CHELYUSKIN				77 43.0				104 17.0				66.2				176.4				64 06.0				-45 12.0				74.0				37.0			
CC = COLLEGE				64 51.6				-147 50.2				64.8				256.5				71 35.0				129 00.0				68.4				191.4			
GMR = GREAT WHALE R.				55 16.0				-77 47.0				60.5				347.4				66 09.8				-169 50.1				61.7				237.0			
I = OIKSON ISLAND				73 32.6				80 33.7				61.5																							

IDENTIFICATION	GEOGRAPHIC				GEOGRAPHIC				IDENTIFICATION				GEOGRAPHIC				GEOGRAPHIC																	
	LAT	LONG	LAT	LONG	LAT	LONG	LAT	LONG	LAT	LONG	LAT	LONG	LAT	LONG	LAT	LONG																		
AI = ABISKO	68 21.5	18 49.4	66.0	134.0	FC = FT. CHURCHILL	58 44.0	-94 06.0	68.7	322.0	LR = LEYVOGUR	64 11.0	-21 42.0	70.2	71.0	CC = C CHELYUSKIN	77 43.0	104 17.0	66.2	176.4	CC = COLLEGE	64 51.6	-147 50.2	64.5	256.5	GMR = 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
BM = BARROW	71 18.2	-156 44.9	68.5	241.1	NAS = NASSARSUQ	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 UELÉN	66 03.8	-169 50.1	61.7	237.0															

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

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

IDENTIFICATION

GEOGRAPHIC

GEOMAGNETIC

IDENTIFICATION

GEOGRAPHIC

GEOMAGNETIC

AI = ABISKO	LAT	LONG	LAT	LONG	LAT	LONG
BM = BARRON	68 21.5	18 49.4	66.0	114.9	58 48.0	-94 56.0
CC = C. CHELYUSKIN	71 18.2	-156 44.9	68.5	241.1	64 11.0	-21 42.0
CO = COLLEGE	77 43.0	104 17.0	66.2	176.4	61 06.0	-45 12.0
GHR = GREAT WHALE R.	64 51.6	-147 53.2	64.6	256.5	71 38.0	129 00.0
DI = DIXON ISLAND	73 32.6	80 33.7	63.0	161.5	66 09.8	-169 50.1
					61.7	237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

NOVEMBER 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	GHR	GHR	FC	FC	FC	FC	FC	TI	BM	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
2	FC	FC	FC	FC	FC	FC	FC	FC	TI	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
3	FC	GHR	GHR	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
4	GHR	FC	FC	FC	GHR	FC	FC	FC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
5	FC	GHR	FC	FC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
6	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
7	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
8	GHR	FC	BM	BM	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
9	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
10	FC	FC	FC	GHR	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
11	TI	BM	TI	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
12	FC	FC	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
13	GHR	GHR	BM	BM	FC	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
14	BM	BM	GHR	FC	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
15	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
16	DI	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
17	GHR	GHR	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
18	GHR	GHR	LR	GHR	AT	AT	BM	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
19	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
20	BM	DI	BM	DI	AT	AT	NES	NAS	NAS	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
21	DI	DI	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
22	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
23	GHR	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
24	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
25	FC	FC	FC	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
26	NAS	NAS	NAS	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
27	NAS	BM	GHR	GHR	BM	BM	NAS	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
28	BM	FC	FC	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
29	BM	GHR	BM	FC	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR
30	GHR	GHR	GHR	BM	BM	BM	CC	CC	CC	CC	CC	CC	CC	CC	TI	TI	LR	DI	DI	LR	LR	LR	LR	LR

IDENTIFICATION

IDENTIFICATION

GEOGRAPHIC

GEOGRAPHIC

AT = ABISKO

BM = BARROW

CC = C. CHELYUSKIN

CO = COLLEGE

GHR = GREAT WHALE R.

DI = DIKSON ISLAND

LAT LONG

68 21.5

71 16.2

77 43.0

64 51.6

55 16.0

73 32.6

LAT LONG

10 49.4

-156 44.9

104 17.6

-147 50.2

-77 47.0

80 33.7

LAT LONG

56.0

66.5

66.2

64.6

66.5

63.0

LAT LONG

114.9

241.1

176.4

256.5

347.4

161.5

FC = FT. CHURCHILL

LR = LEIRVOGUR

NAS = NARSARSUAQ

TI = TIKSI BAY

UE = CAPE UELLEN

LAT LONG

58 48.0

64 11.0

61 06.0

71 35.0

66 09.8

50.1

LAT LONG

94 06.0

-21 42.0

-45 12.0

129 00.0

-169 50.1

61.7

LAT LONG

65.7

70.2

71.0

37.0

68.4

237.0

LAT LONG

32.8

71.0

37.0

191.4

61.7

237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

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	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO										
2	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO										
3	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO										
4	DI	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
5	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO										
6	AI	NAS	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
7	LR	AI	AI	AI	GHR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
8	AI	AI	AI	AI	AI	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
9	NAS	UE	UE	UE	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
10	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
11	LR	NAS	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
12	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
13	TI	NAS	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
14	LR	LR	LR	NAS	FC	FC	GHR	GHR	GHR	GHR	BM	AI	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC										
15	TI	TI	TI	TI	DI	DI	DI	DI	DI	DI	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC										
16	TI	TI	TI	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC										
17	AI	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	BM	BM	BM	BM	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
18	LR	LR	LR	TI	NAS	NAS	NAS	NAS	NAS	NAS	NAS	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI										
19	TI	AI	AI	LR	LR	LR	LR	LR	TI	NAS	UE	FC	BM	FC	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM									
20	UE	UE	UE	AI	UE	TI	BM	BM	BM	BM	BM	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS										
21	LR	NAS	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO	CO										
22	LR	LR	LR	LR	GHR	NAS	NAS	NAS	NAS	NAS	NAS	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR										
23	AI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR	GHR										
24	LR	LR	LR	LR	NAS	FC	FC	FC	FC	FC	FC	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC										
25	LR	AI	LR	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI	TI										
26	AI	LR	UE	TI	FC	NAS	DI	DI	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC										
27	FC	LR	NAS	LR	NAS	FC	DI	FC	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC										
28	AI	AI	AI	LR	NAS	FC	GHR	NAS	DI	AI	LR	AI	LR	AI	LR	AI	LR	AI	LR	AI	LR	AI	LR	AI	LR										
29	UE	UE	UE	TI	NAS	TI	CO	NAS	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI										
30	UE	UE	UE	UE	NAS	NAS	NAS	LR	LR	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI										
IDENTIFICATION		GEOGRAPHIC										IDENTIFICATION										GEOGRAPHIC										GEOGRAPHIC			
		LAT										LAT										LAT										LAT			
AI = ABISKO		68 21.5										66.8										58 40.0										322.8			
BM = BARRON		71 18.2										68.5										64 11.0										71.0			
CC = C. CHELYUSKIN		77 43.0										104 17.0										61 06.0										78.2			
CO = COLLEGE		54 51.6										-147 50.2										71 35.0										60.4			
GHR = GREAT WHALE R.		95 16.0										-77 47.0										66 09.0										191.4			
I = OIKSON ISLAND		32.6										80 33.7										-169 50.1										237.0			

IDENTIFICATION

GEOGRAPHIC

GEOMAGNETIC

IDENTIFICATION

GEOGRAPHIC

GEOMAGNETIC

AI = ARISKO
 BW = BARROW
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GHR = GREAT WHALE R.
 DI = DIKSON ISLAND

LAT LONG
 68 21.5 10 49.4
 71 10.2 156 44.9
 77 43.0 104 17.0
 84 51.6 147 58.2
 55 15.0 77 47.0
 73 32.6 80 33.7

FC = FT. CHURCHILL
 LR = LEIRVOCUR
 NAS = NASSARSSUAQ
 TI = TINSI BAY
 UE = CAPE UELLEN

LAT LONG
 58 40.0 -94 06.0
 64 11.0 -21 42.0
 61 06.0 -45 12.0
 71 35.0 129 08.0
 66 09.8 -169 50.1

LAT LONG
 60.7 322.8
 71.0 37.0
 71.6 191.4
 60.4 237.0

TABLE OF OBSERVATORIES SUPPLYING HOURLY AU

DECEMBER	1970	AU = MAXIMUM DELTA H																							
		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	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
2	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
3	FC	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
4	CC	NAS	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
5	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
6	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
7	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
8	GHR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
9	BM	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
10	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
11	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
12	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
13	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
14	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
15	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
16	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
17	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS
18	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
19	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
20	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
21	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
22	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
23	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
24	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
25	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS
26	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
27	GHR	GHR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
28	GHR	GHR	GHR	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
29	GHR	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
30	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
31	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC

IDENTIFICATION

AI = ABISKO
 BM = BARRON
 CC = C. CHELYUSKIN
 CO = COLLEGE
 GHR = GREAT WHALE R.
 DI = DIKSON ISLAND

GEOGRAPHIC

LAT LONG
 68 21.5 18 49.4
 71 18.2 156 44.9
 77 43.0 134 17.0
 64 51.6 147 50.2
 55 16.0 77 47.0
 73 32.6 80 33.7

GEOGRAPHIC

LAT LONG
 66.3 114.9
 68.5 241.1
 66.2 176.4
 64.6 256.5
 66.5 347.4
 63.0 161.5

IDENTIFICATION

FC = FL. CHURCHILL
 LR = LEIRVIGUR
 NAS = NASSARSSUAQ
 TI = TIKSI BAY
 UE = CAPE UELLEN

GEOGRAPHIC

LAT LONG
 58 48.0 -94 06.8
 64 11.8 -21 42.0
 61 06.0 -45 12.0
 71 35.8 129 00.0
 66 09.6 -169 50.1

GEOGRAPHIC

LAT LONG
 58 48.0 -94 06.8
 64 11.8 -21 42.0
 61 06.0 -45 12.0
 71 35.8 129 00.0
 66 09.6 -169 50.1

TABLE OF OBSERVATORIES SUPPLYING HOURLY AL

DECEMBER 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	UE	TI	GMR	GMR	GMR	GMR	GMR	GMR	NAS	GMR	GMR	LR	NAS	GMR	GMR	GMR	GMR	GMR	FC	CC	CC	CC	CC	CC
2	CC	UE	TI	GMR	GMR	GMR	GMR	GMR	GMR	LR	LR	LR	LR	GMR	GMR	GMR	GMR	GMR	GMR	FC	CC	CC	CC	CC	CC
3	LR	LR	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
4	BM	BM	BM	BM	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
5	LR	LR	LR	NAS	GMR	GMR	GMR	GMR	GMR	GMR	GMR	GMR	BM	BM	UE	UE	UE	UE	UE	GMR	GMR	GMR	GMR	GMR	GMR
6	UE	NAS	NAS	NAS	GMR	GMR	GMR	GMR	GMR	GMR	GMR	FC	FC	BM	CO	BM	BM	BM	BM	TI	BM	CC	CC	CC	CC
7	LR	LR	NAS	LR	GMR	GMR	GMR	GMR	GMR	GMR	FC	FC	CO	CO	CO	CO	CO	CO	CO	TI	TI	CC	CC	CC	CC
8	AI	AI	AI	LR	LR	NAS	GMR	CO	GMR	FC	CO	CO	CO	CO	CO	CO	CO	CO	CO	TI	TI	CC	CC	CC	CC
9	AI	LR	LR	LR	NAS	NAS	FC	GMR	FC	FC	FC	FC	FC	BM	BM	BM	BM	BM	BM	CC	CC	CC	CC	CC	CC
10	BM	BM	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	CC	CC	CC	CC	CC	CC
11	UE	UE	TI	NAS	NAS	FC	GMR	FC	FC	FC	FC	AI	LR	BM	NAS	BM	NAS	GMR	GMR	DI	DI	NAS	CC	CC	CC
12	CO	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	CC	CC	CC	CC	CC	CC
13	CC	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	CC	CC	CC	CC	CC	CC
14	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
15	CC	LR	LR	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	BM	FC	FC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
16	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
17	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
18	CC	LR	LR	LR	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
19	LR	NAS	NAS	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
20	LR	NAS	NAS	NAS	NAS	NAS	NAS	GMR	GMR	GMR	GMR	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
21	LR	LR	NES	NAS	NAS	NAS	GMR	GMR	FC	GMR	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
22	CC	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
23	CC	CC	CC	NAS	NAS	NAS	DI	LR	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI	AI
24	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
25	CC	BM	BM	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
26	UE	CC	LR	LR	AI	FC	NAS	NAS	GMR	NAS	AI	NAS	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
27	UE	AI	CC	LR	LR	LR	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
28	CC	CC	CC	LR	NAS	NAS	NAS	NAS	NAS	GMR	CC	GMR	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC	FC
29	CC	CC	CC	LR	NAS	NAS	NAS	NAS	NAS	GMR	BM	GMR	AI	GMR	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM	BM
30	AI	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR	LR
31	LR	NAS	CC	NAS	CC	NAS	DI	DI	LR	UE	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS	NAS
IDENTIFICATION		GEOGRAPHIC				GEOGRAPHIC				IDENTIFICATION				GEOGRAPHIC				GEOGRAPHIC				GEOGRAPHIC			
		LAT				LONG				LAT				LONG				LAT				LONG			
AI = ABISKO		68 21.5				18 49.4				66.0				114.9				58 49.0				-94 06.0			
BM = BARROW		71 18.2				-156 44.9				68.5				241.1				64 11.0				-21 42.0			
CC = C. CHELYUSKIN		77 43.0				104 17.0				66.2				176.4				61 05.3				-49 12.0			
CO = COLLEGE		64 51.6				-147 50.2				64.6				256.5				71 35.0				129 00.0			
GMR = GREAT WHALE R.		55 16.0				-77 47.0				66.5				347.4				66 09.0				-169 50.1			
DI = DIKSON ISLAND		73 32.6				80 33.7				63.0				161.5				61 7				237 0			

SECTION III

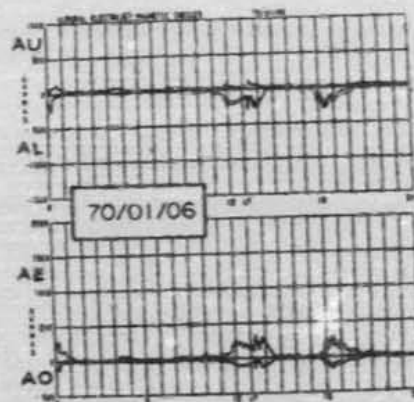
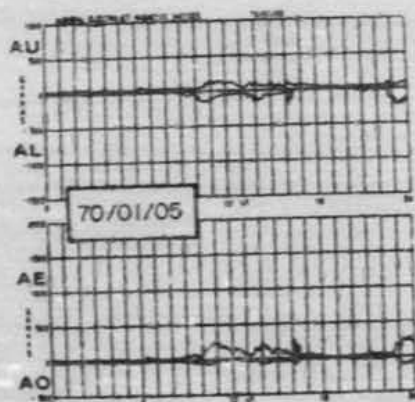
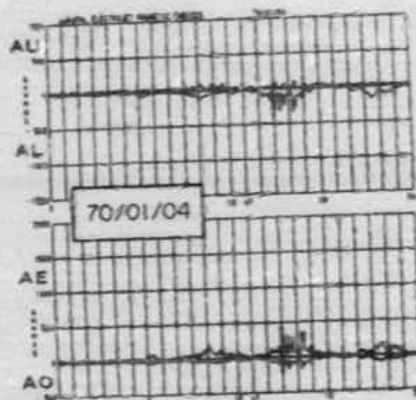
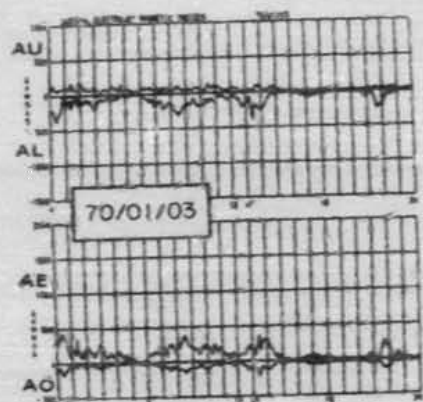
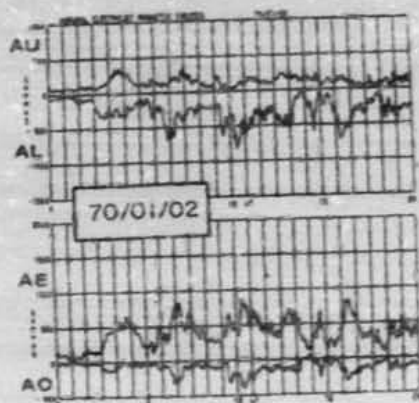
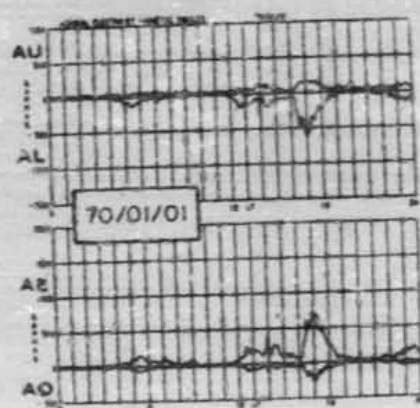
GRAPHS OF INDICES

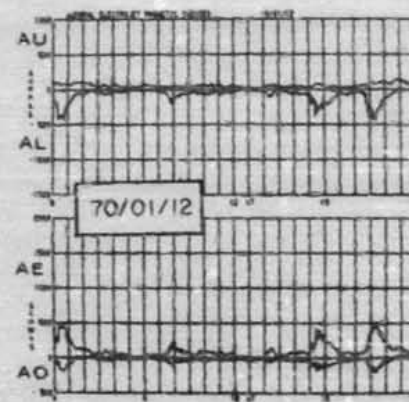
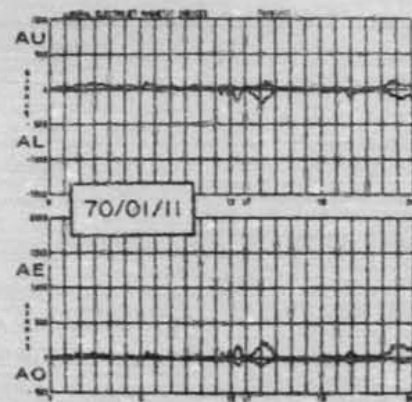
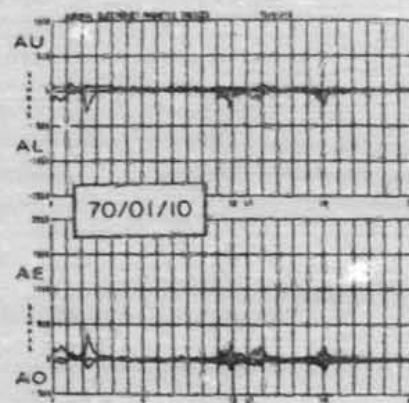
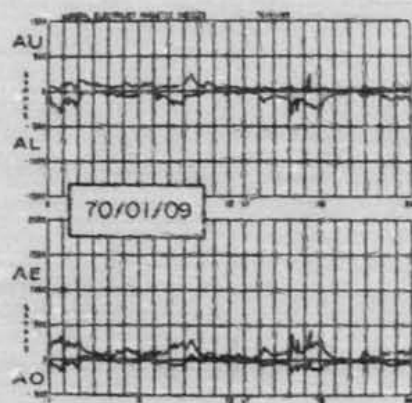
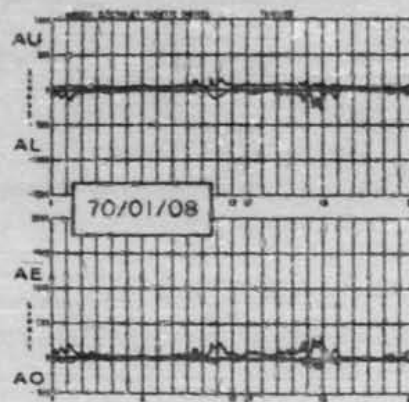
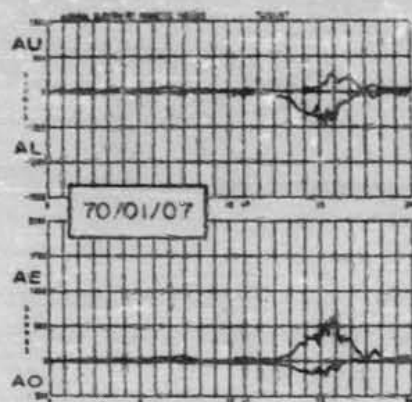
Daily Graphs of 2.5-min Auroral Electrojet Indices

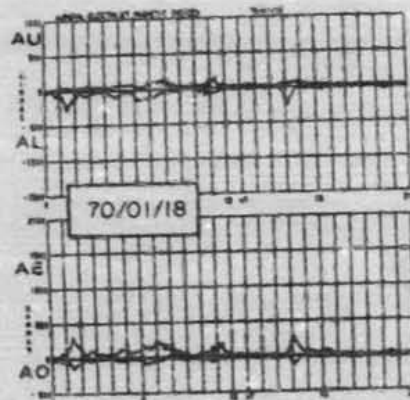
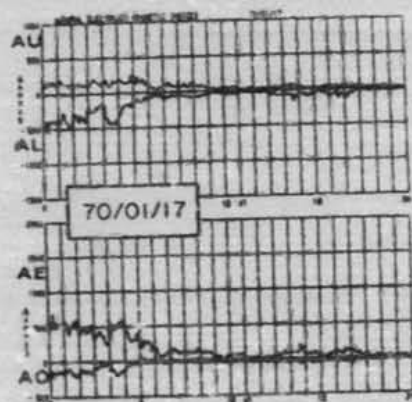
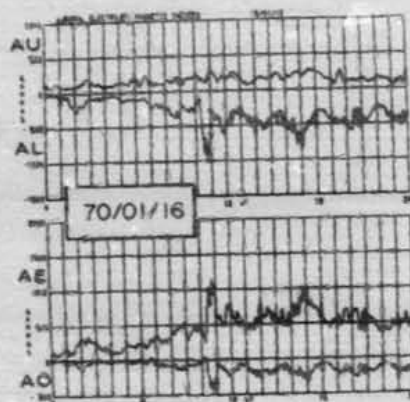
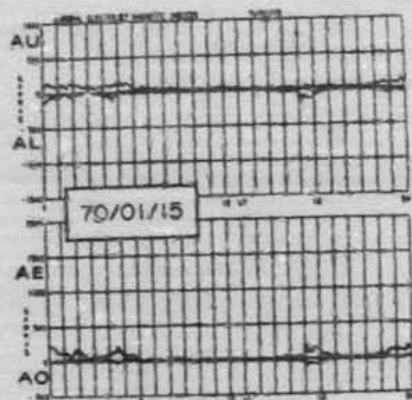
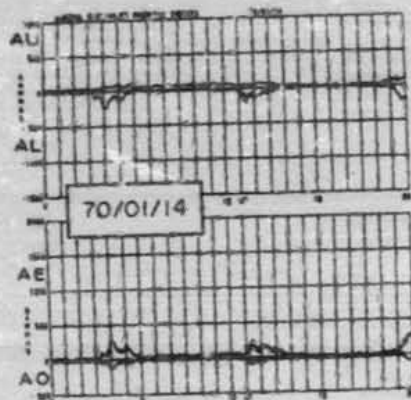
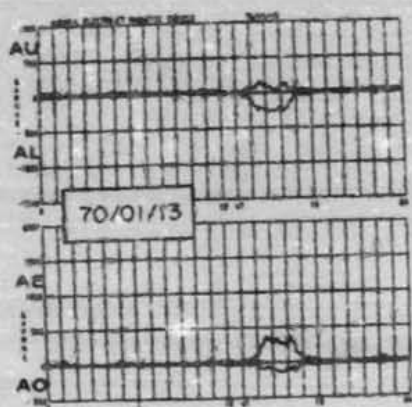
The following graphs are computer drawn plots of variations of the 2.5-min indices AU, AL, AE, and AO for each day of 1970. They are printed from microfilm produced by the computer but with drafted labels to improve legibility of the small characters. The dates are given as year/month/day in descending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

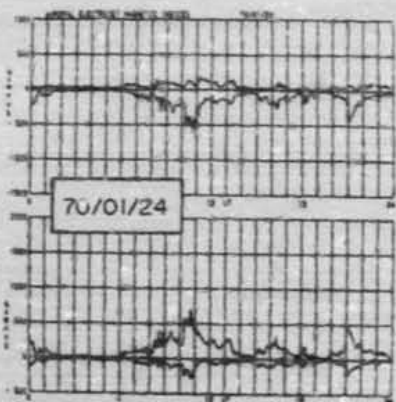
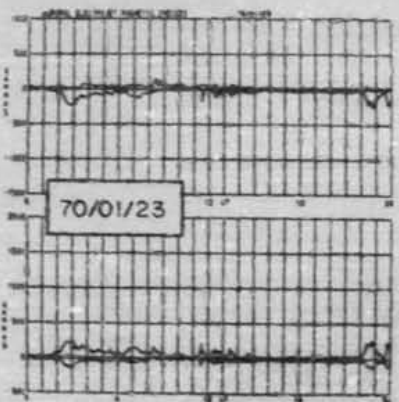
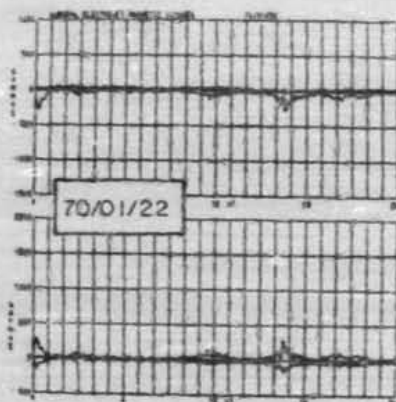
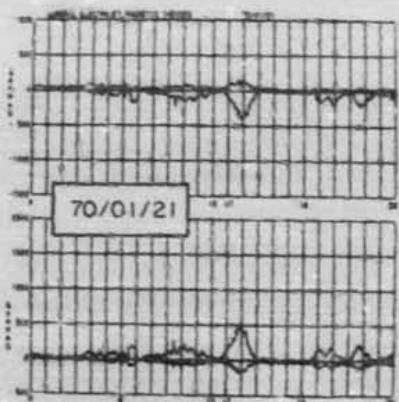
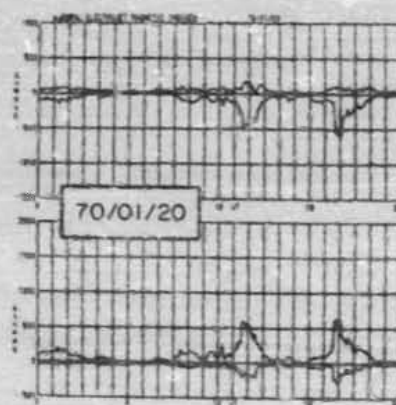
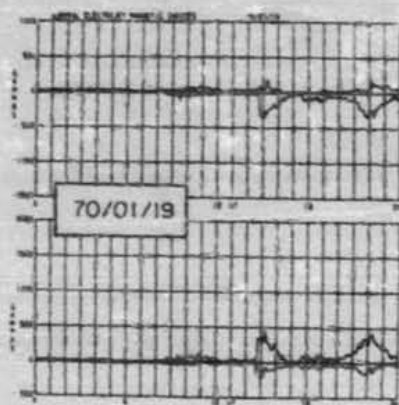
CORRECTIONS TO UAG-22

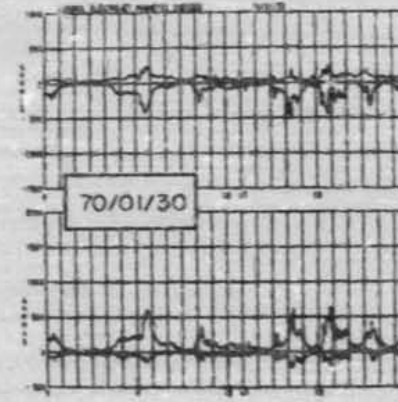
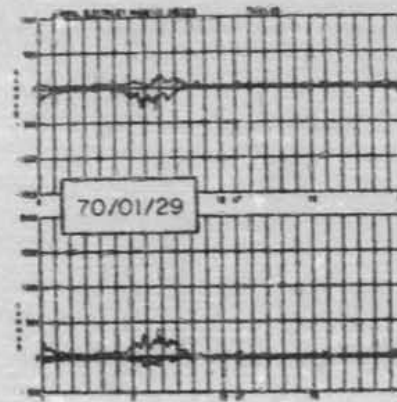
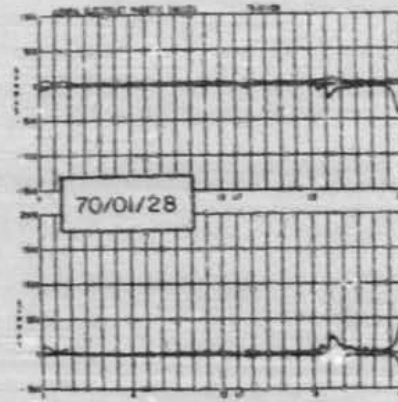
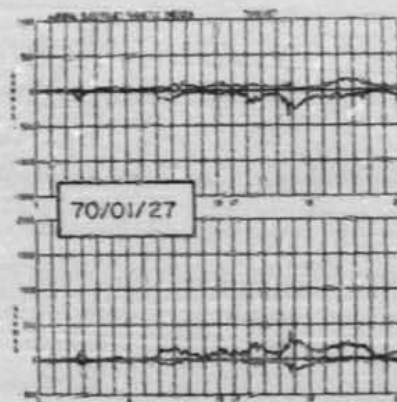
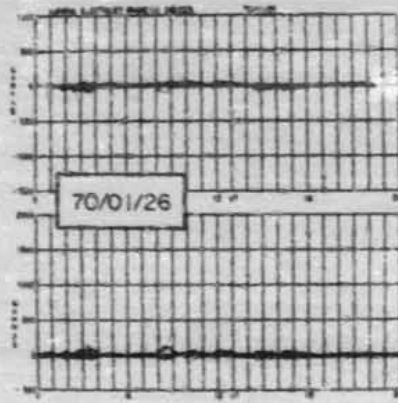
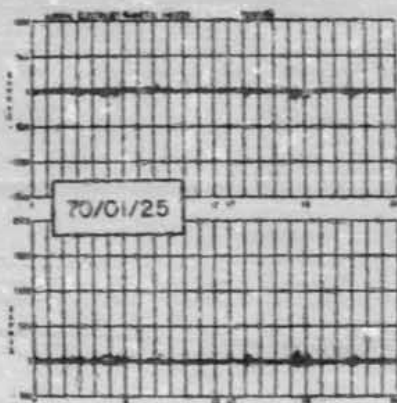
1. The graphs on pages 86-88 are correctly and prominently labeled along the vertical axis: AU, AL, AE, AO. The corresponding labels were inadvertently omitted from the graphs on pages 89-146.
2. On page 92, in the graph for 70/02/10 (10 Feb 1970), the three hours of record shown for 0420 to 0730 UT 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.

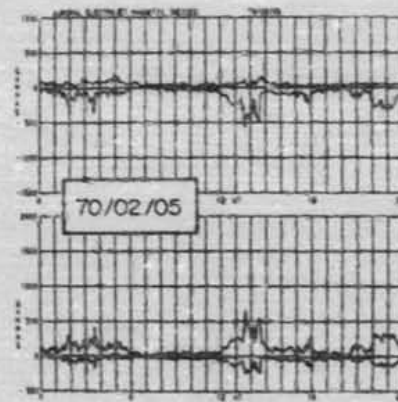
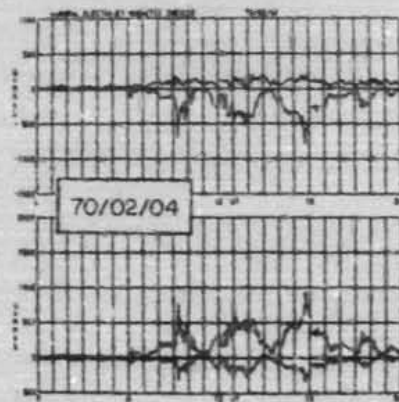
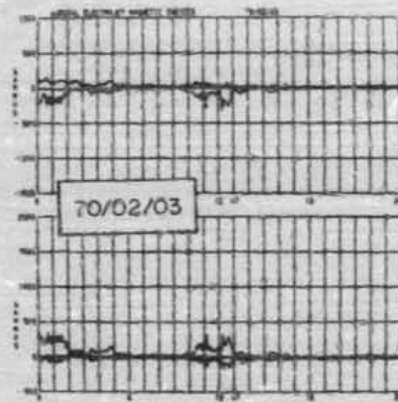
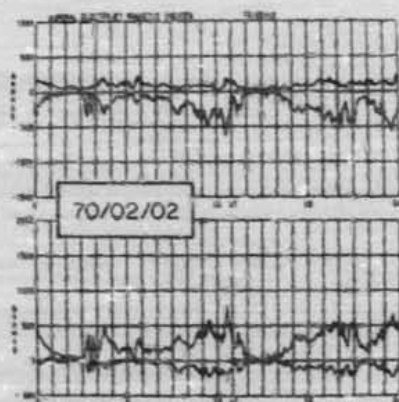
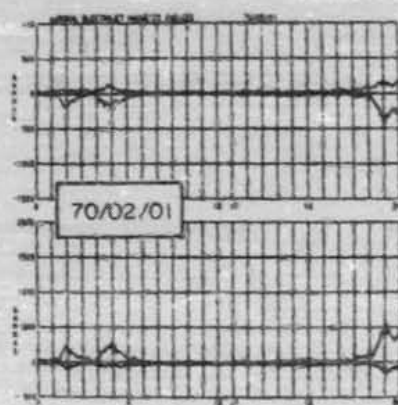
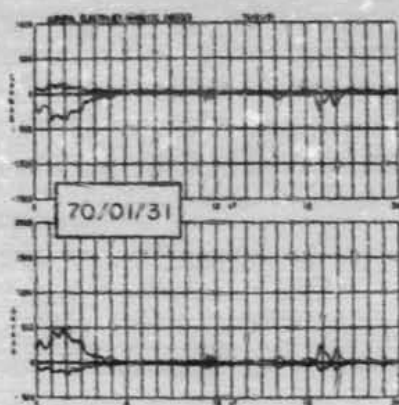


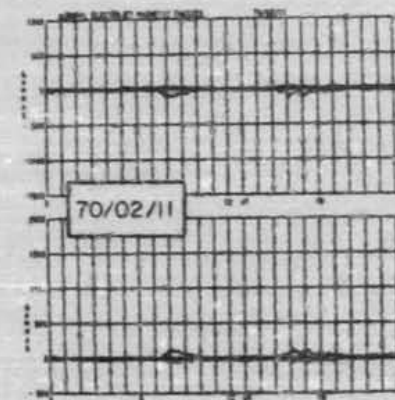
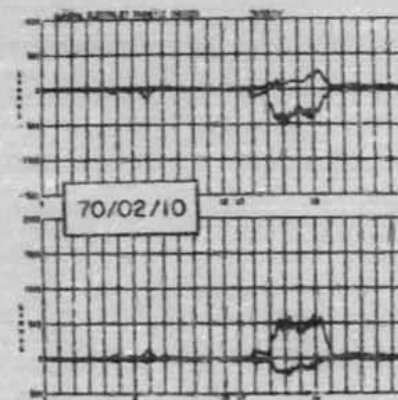
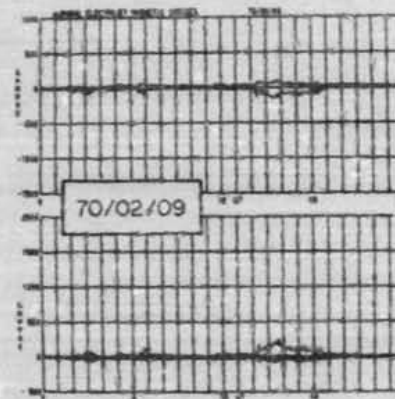
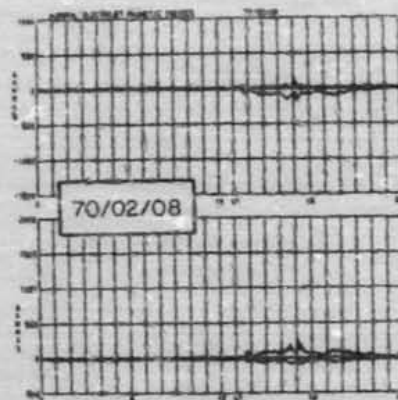
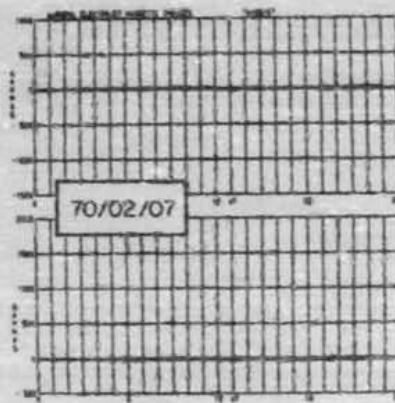
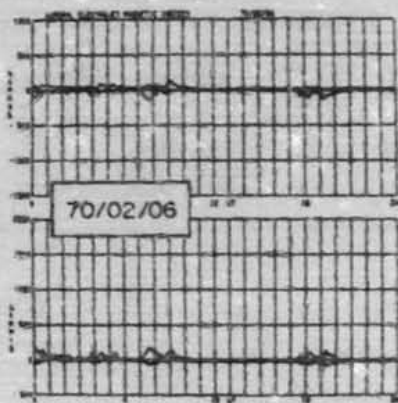


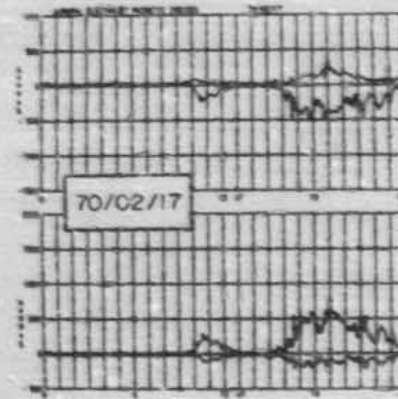
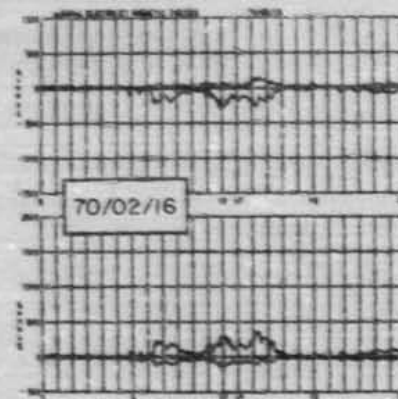
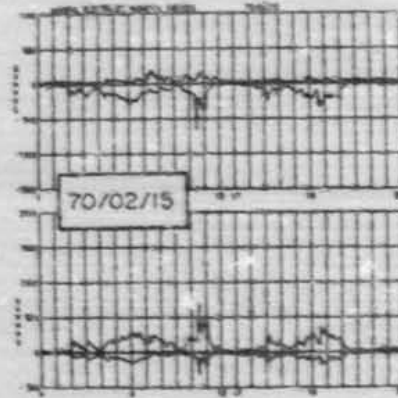
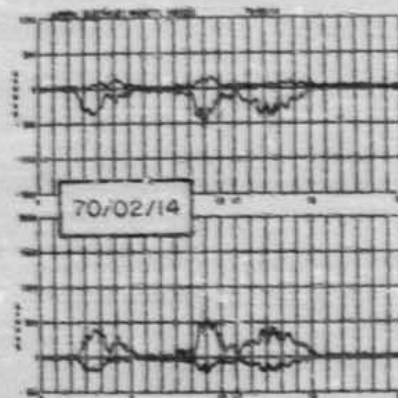
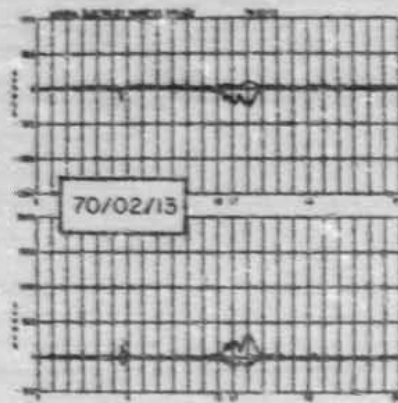
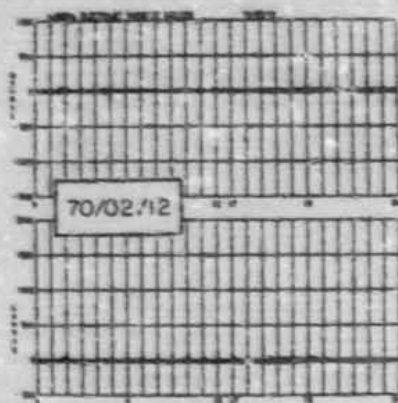


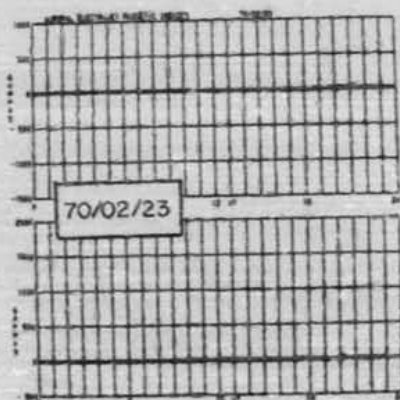
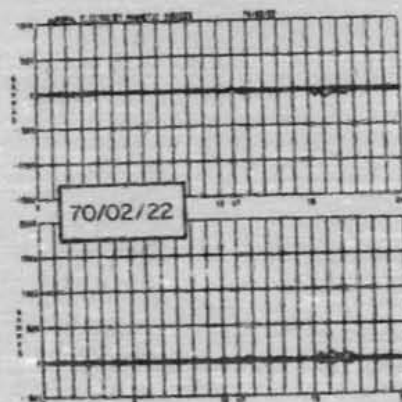
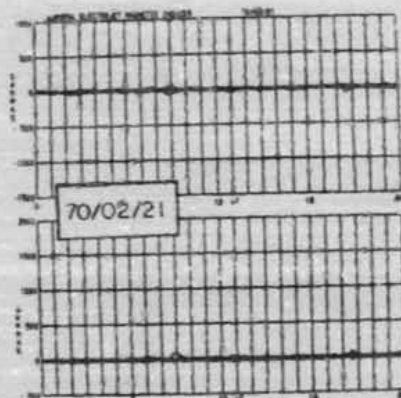
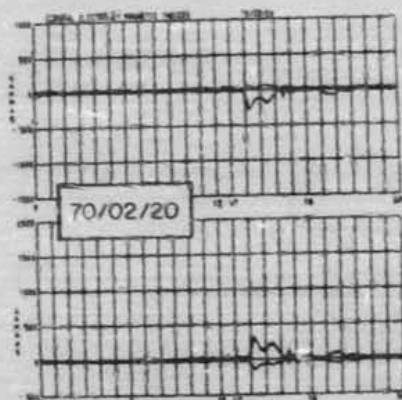
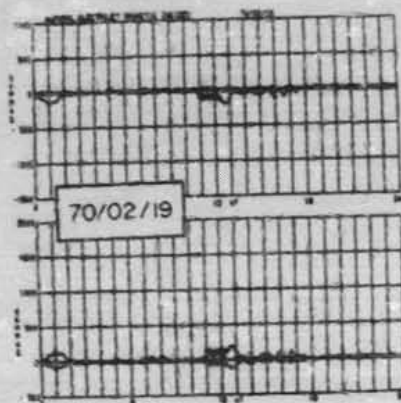
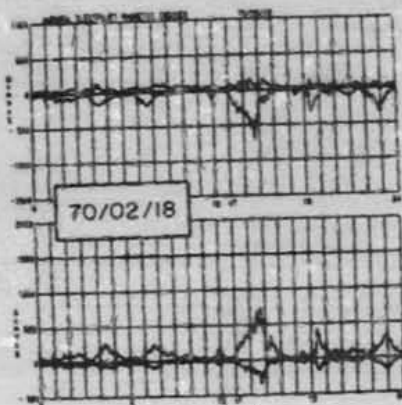


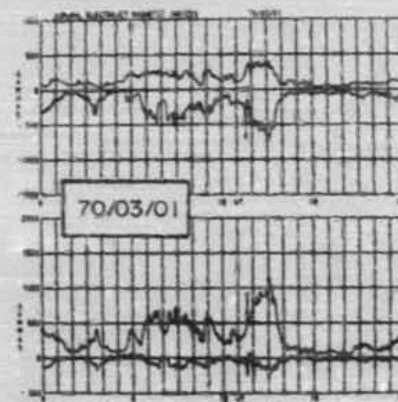
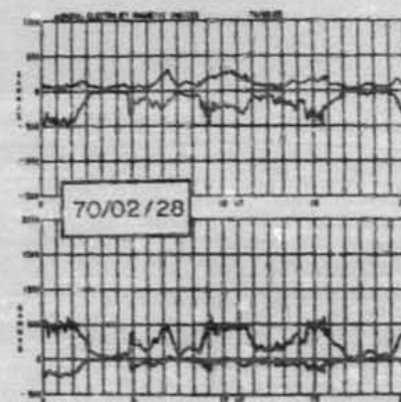
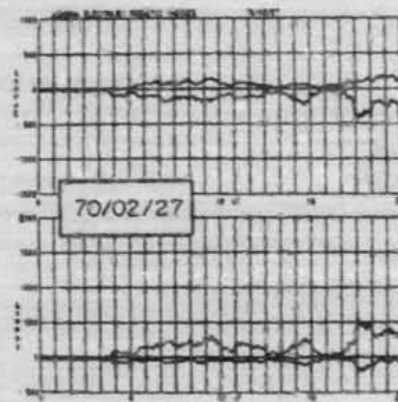
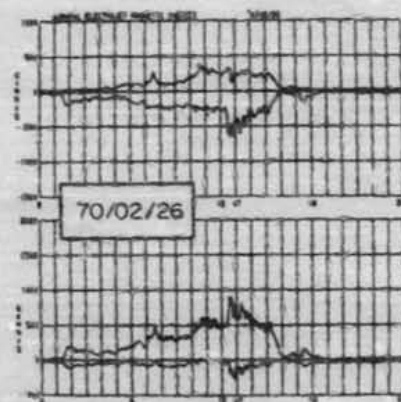
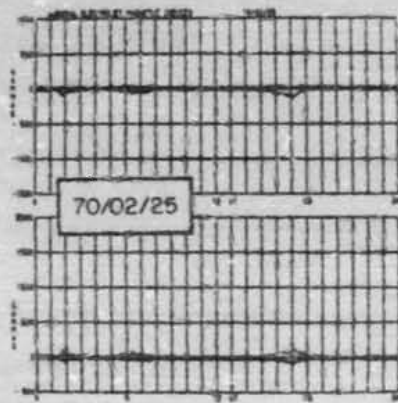
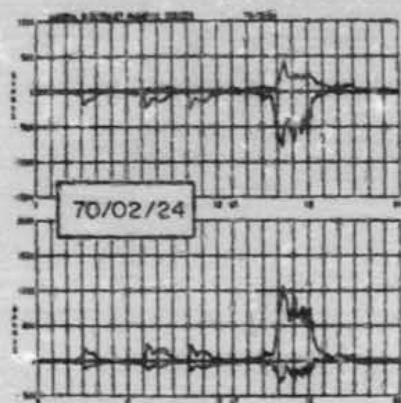


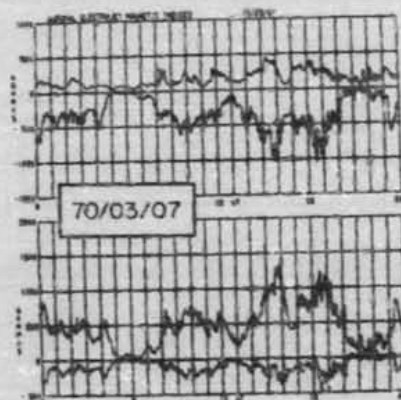
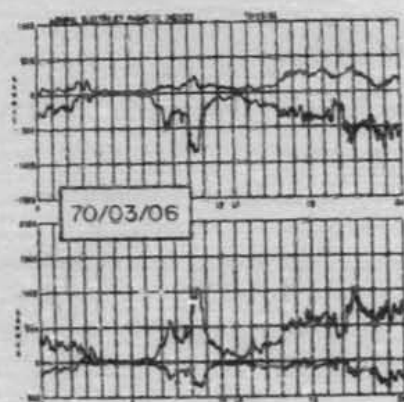
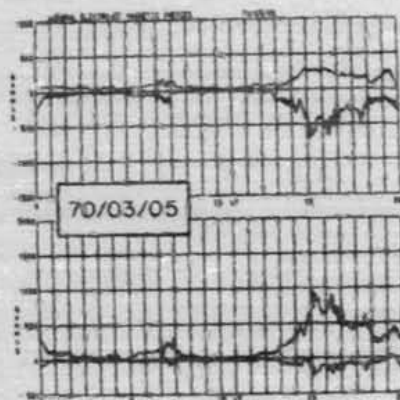
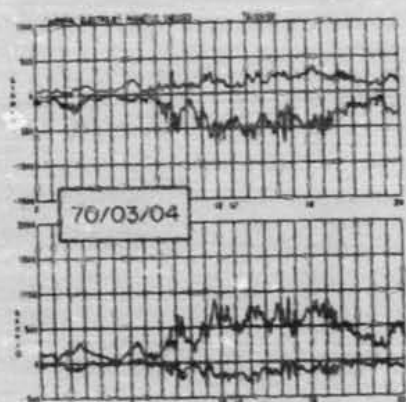
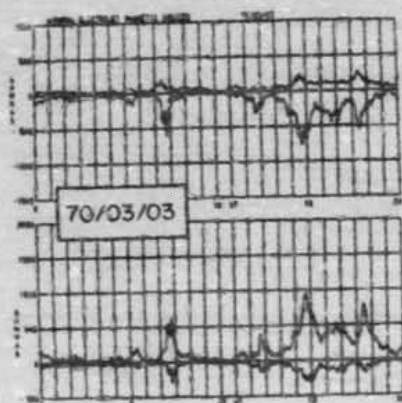
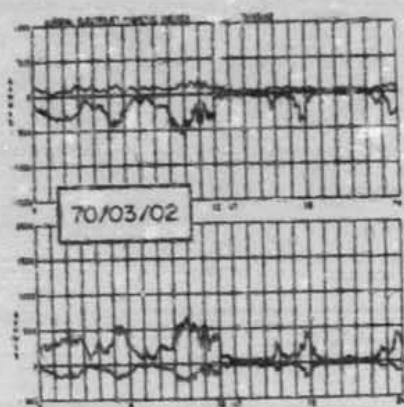


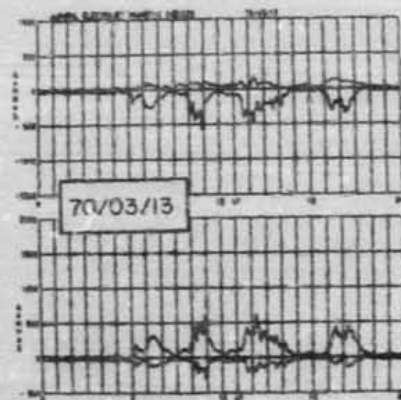
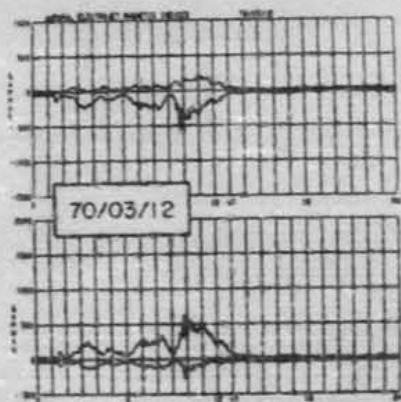
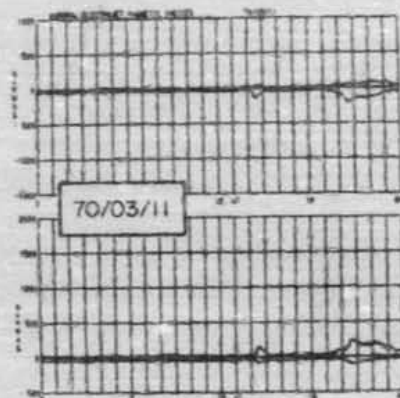
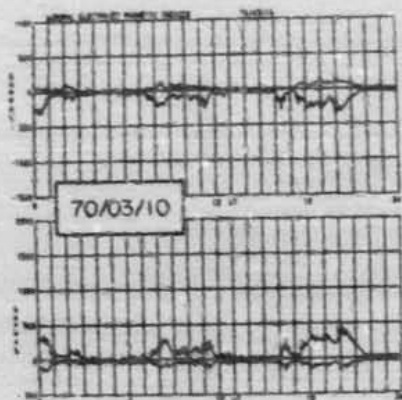
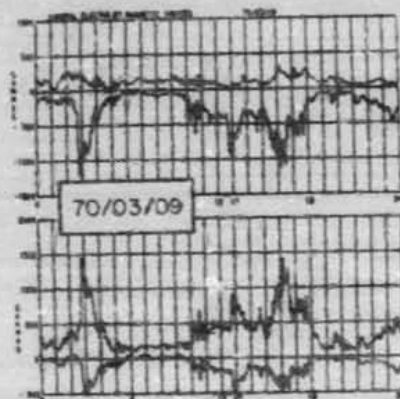
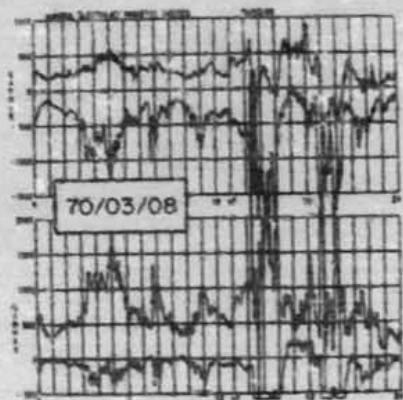


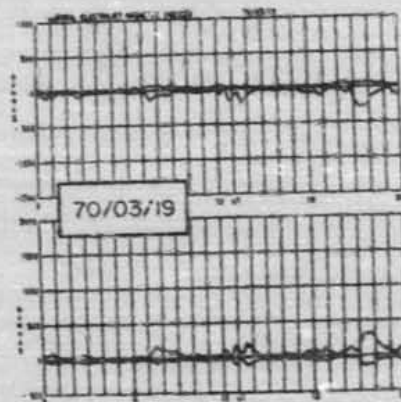
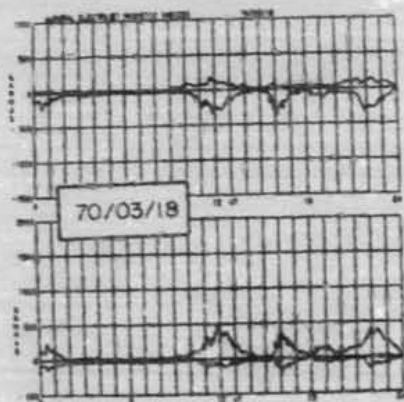
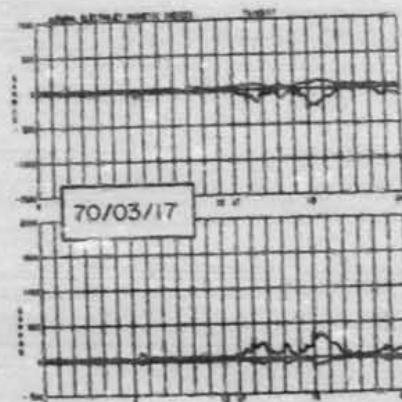
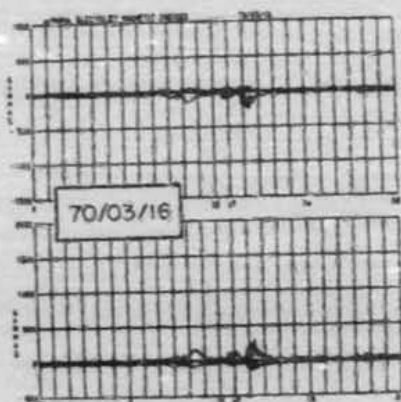
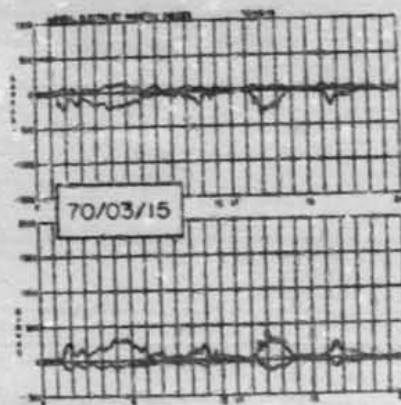
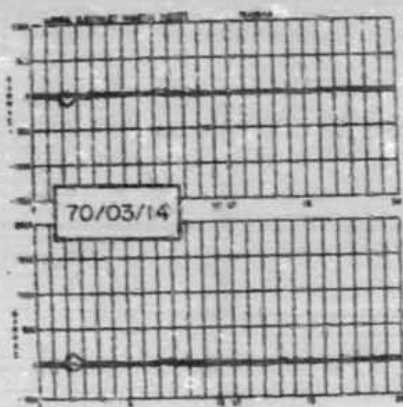


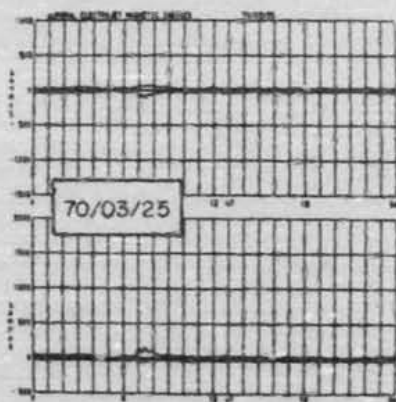
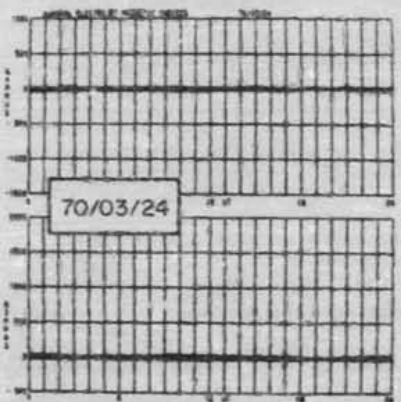
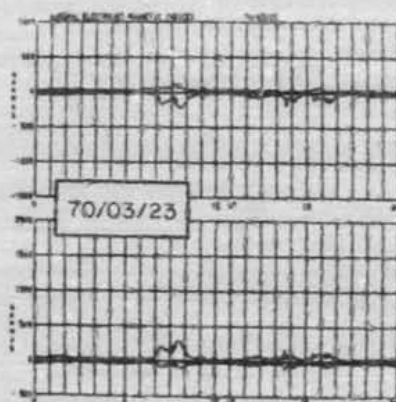
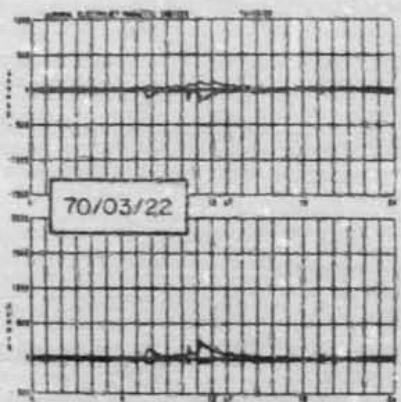
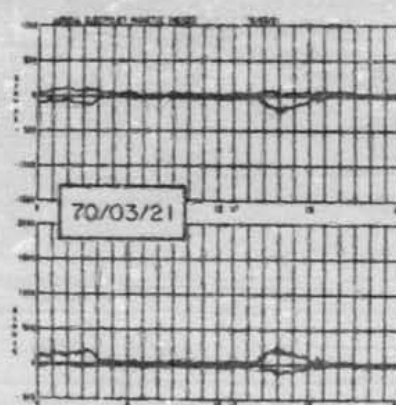
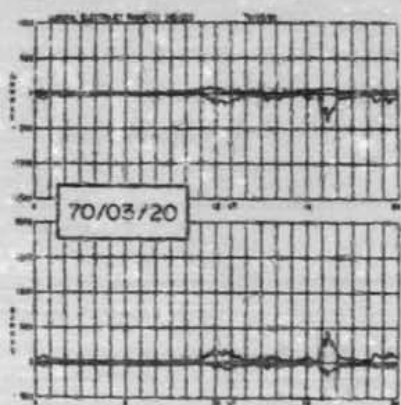


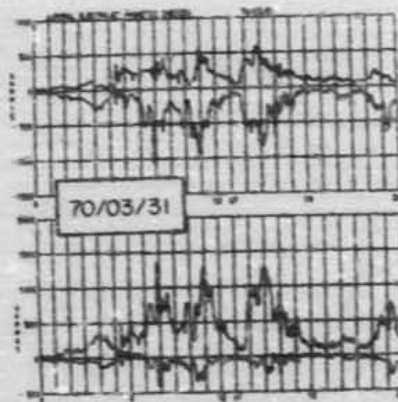
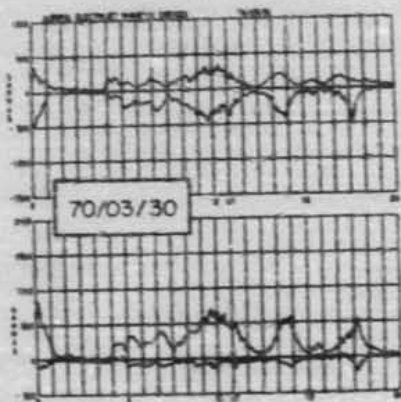
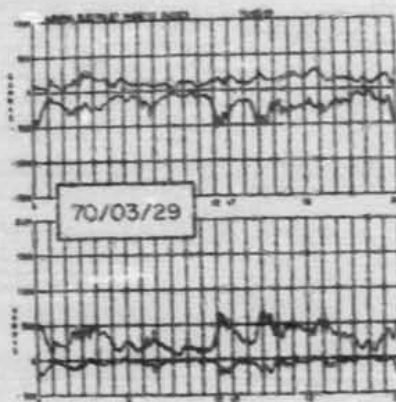
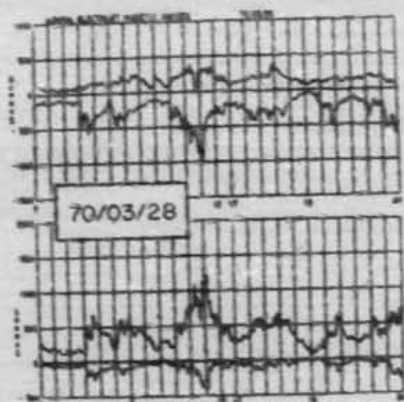
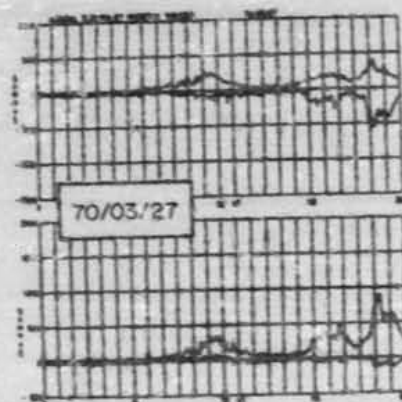
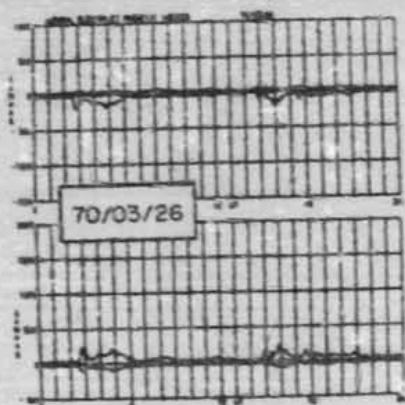


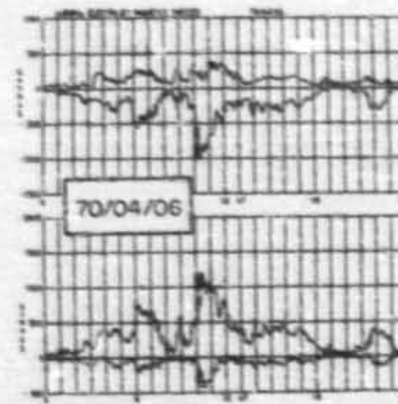
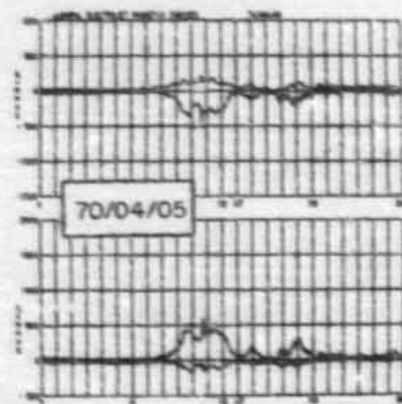
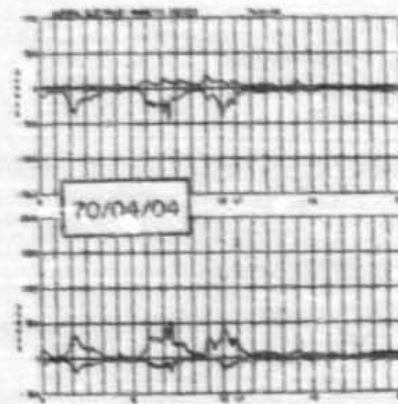
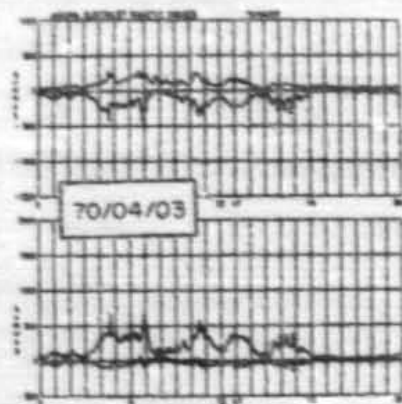
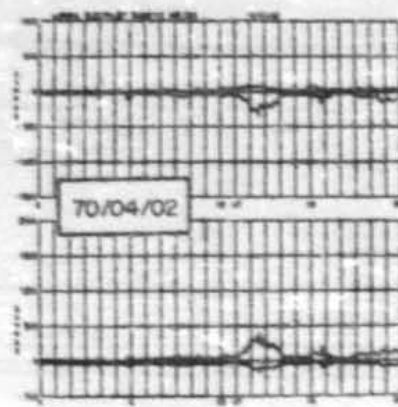
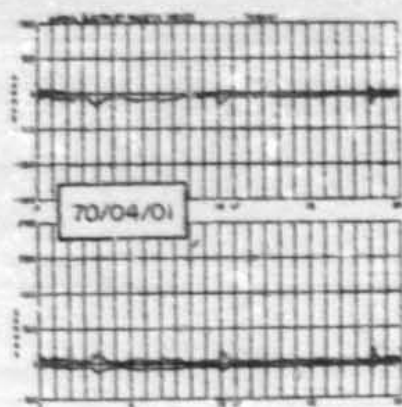


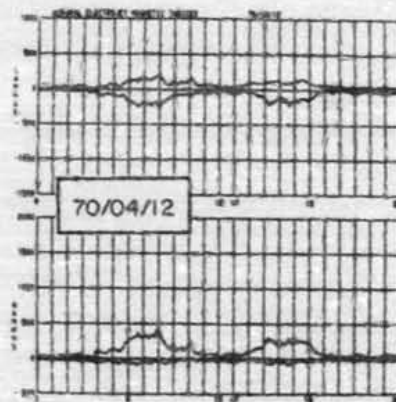
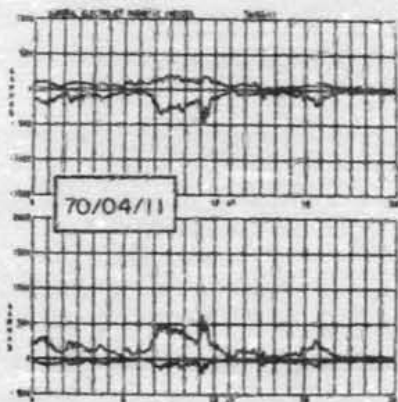
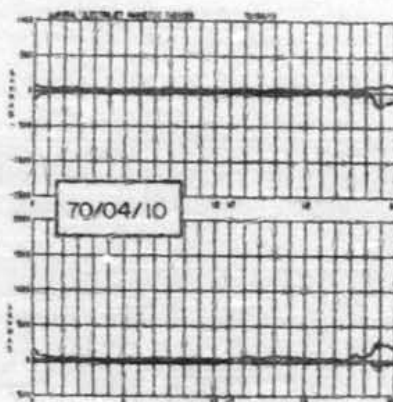
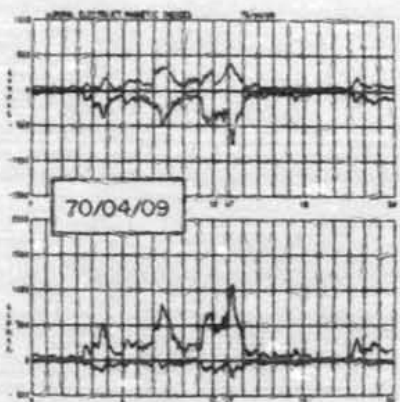
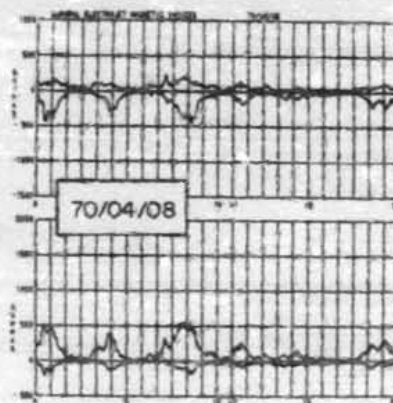
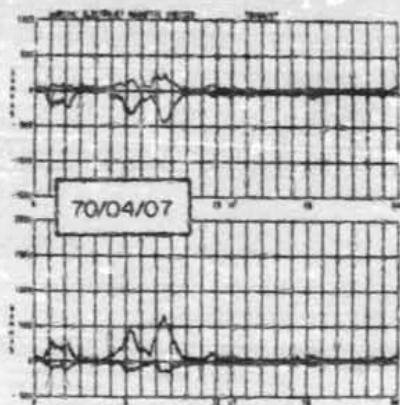


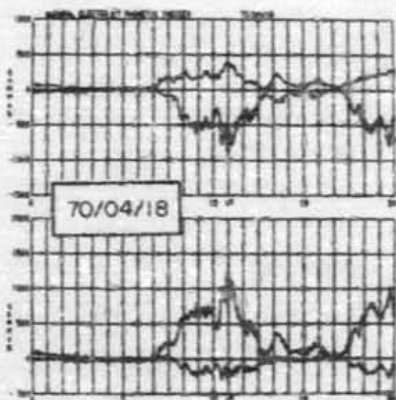
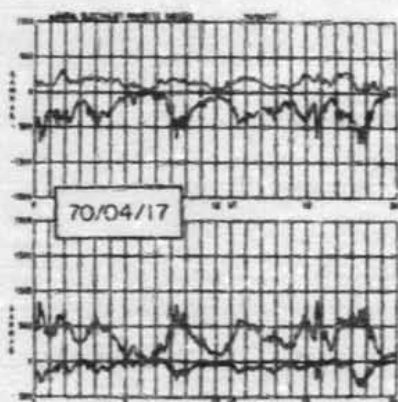
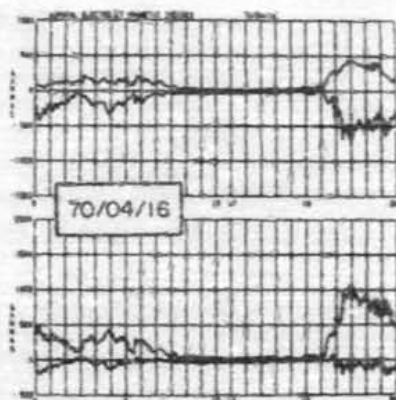
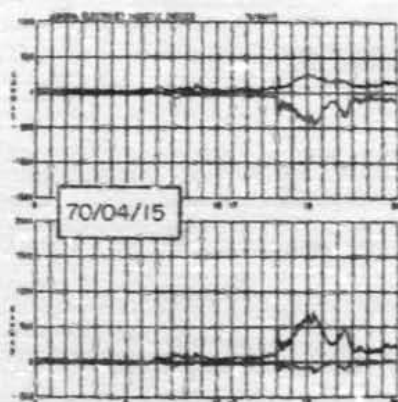
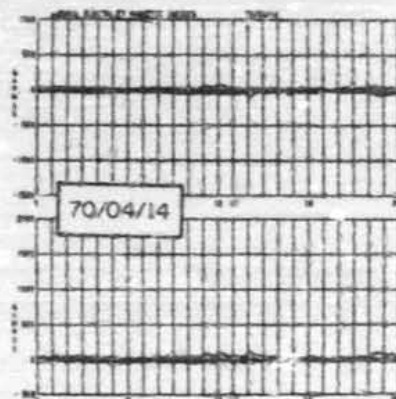
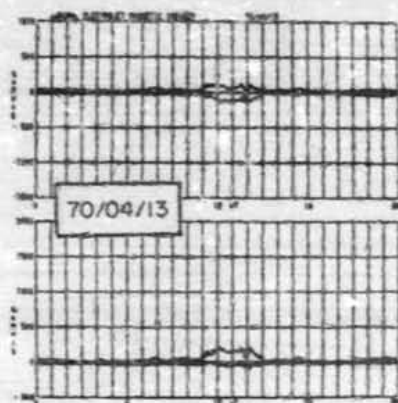


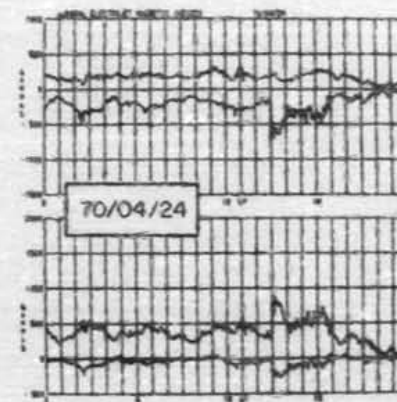
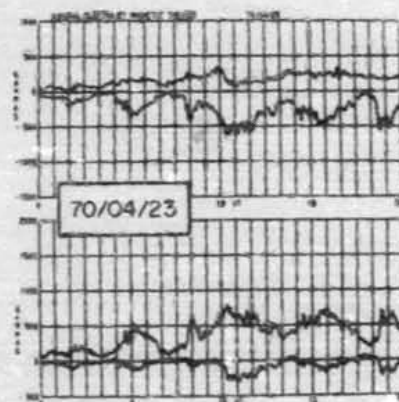
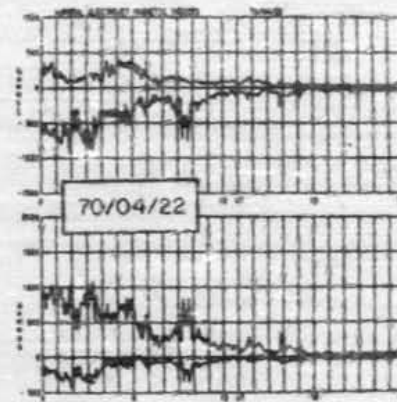
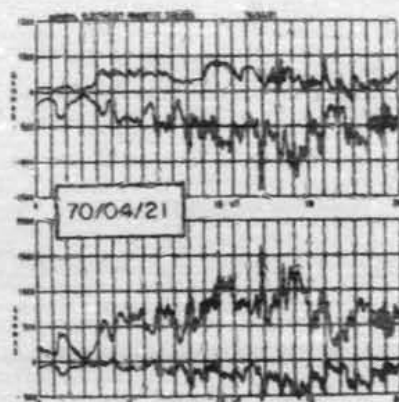
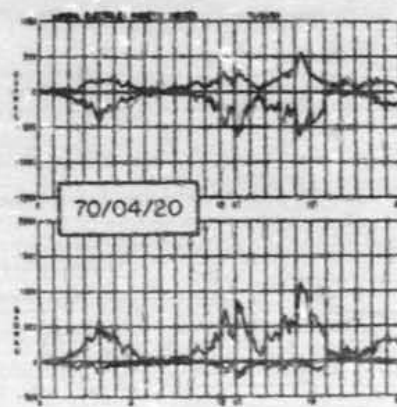
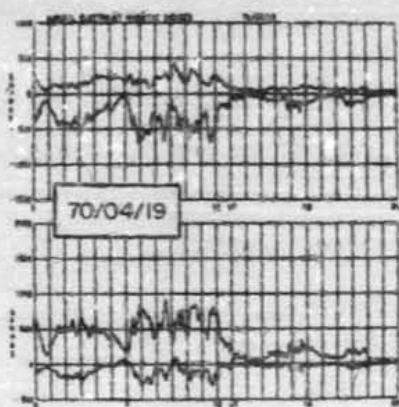


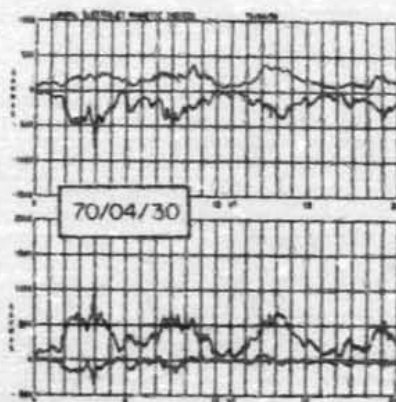
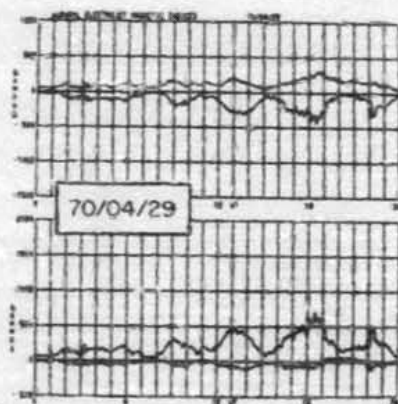
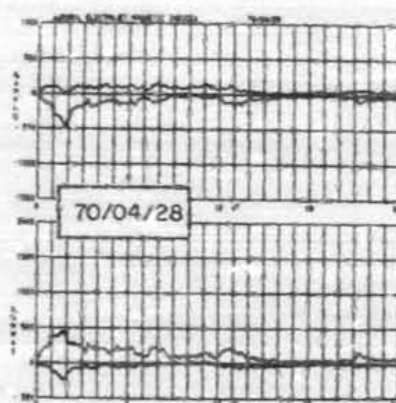
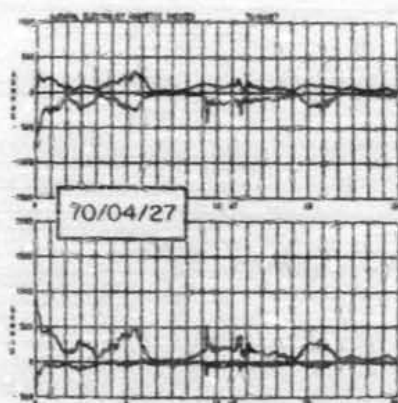
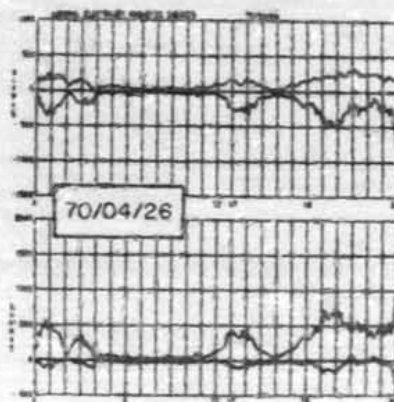
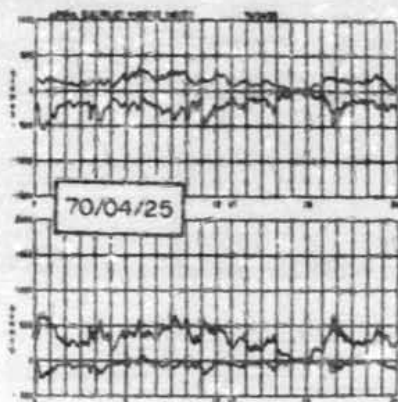


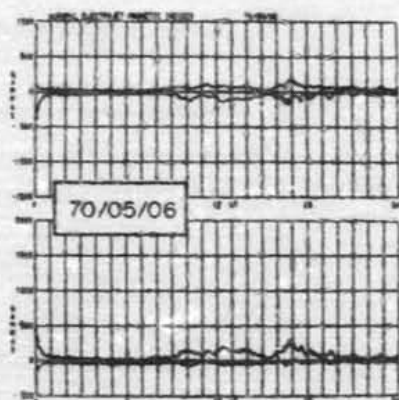
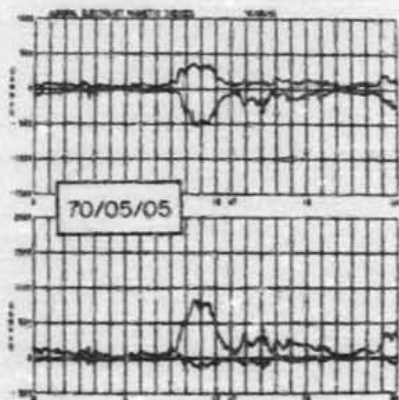
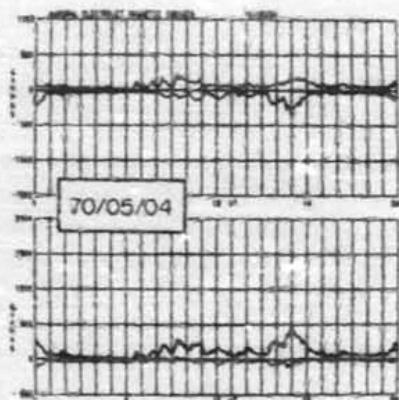
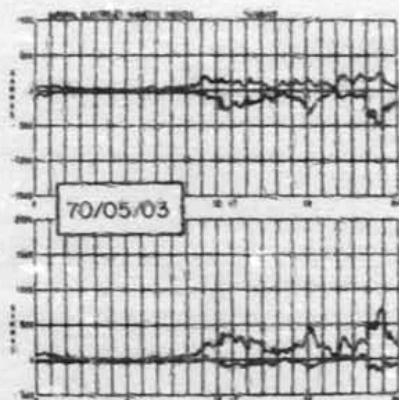
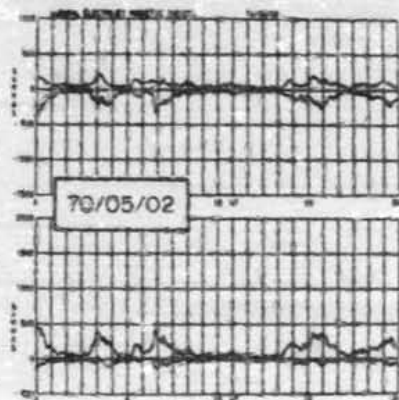
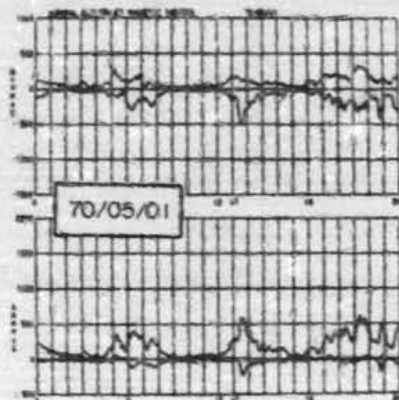


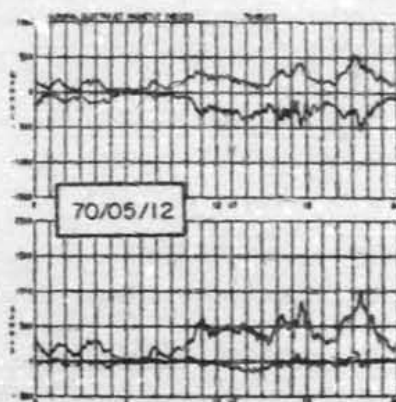
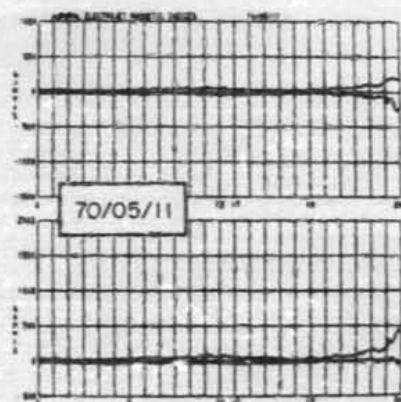
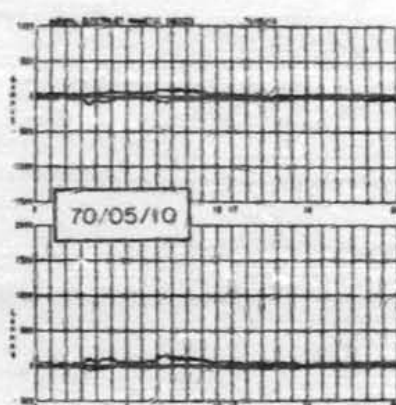
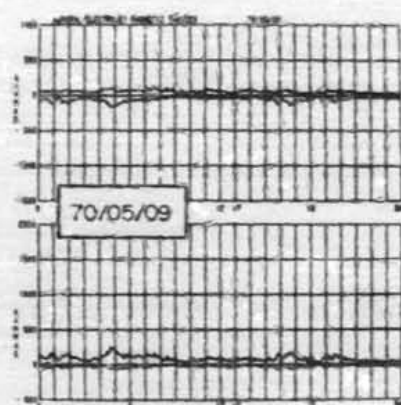
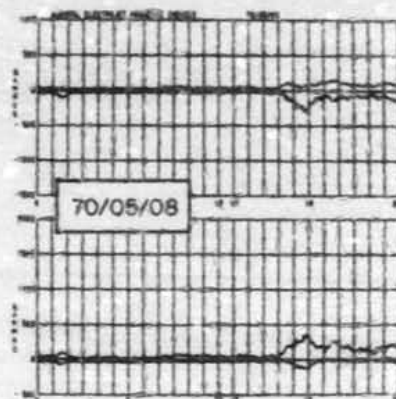
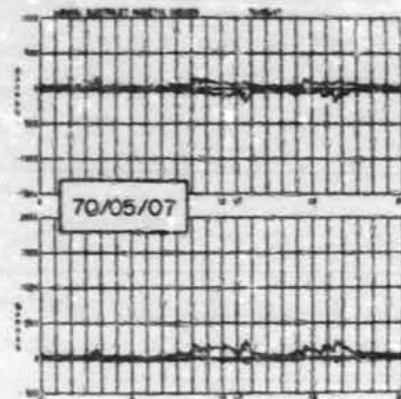


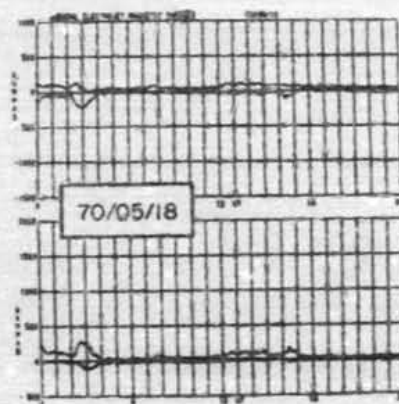
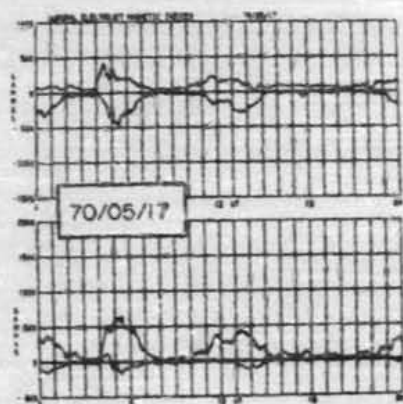
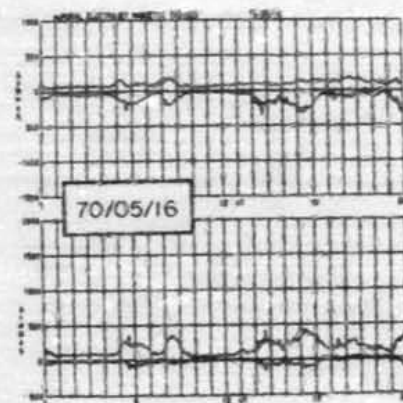
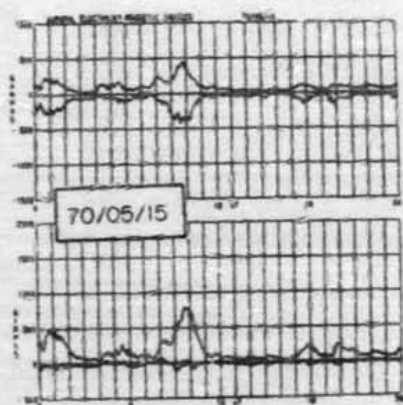
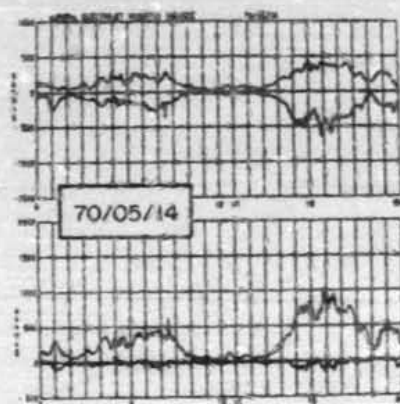
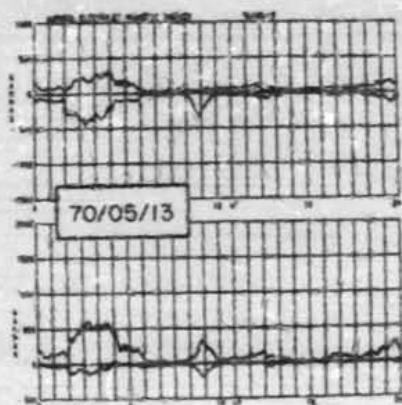


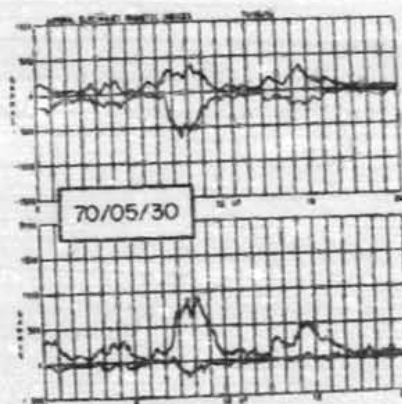
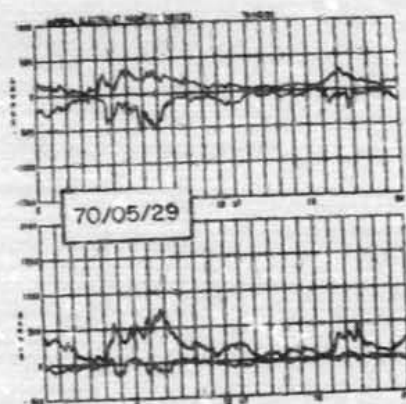
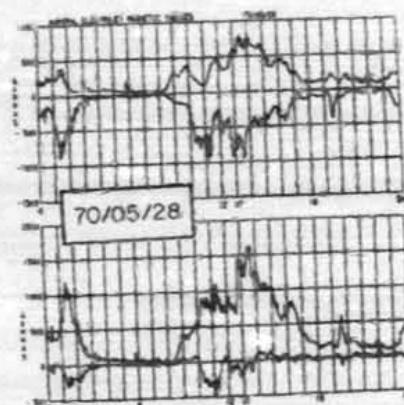
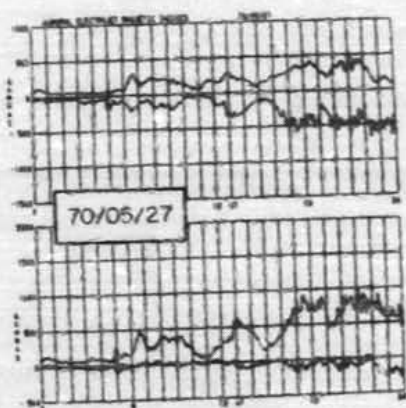
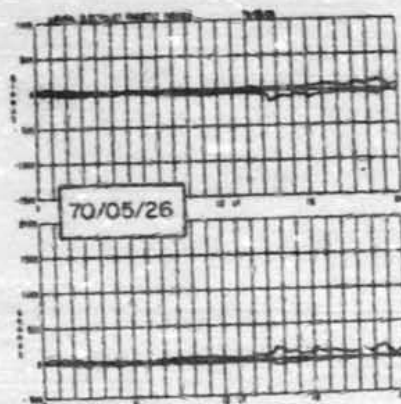
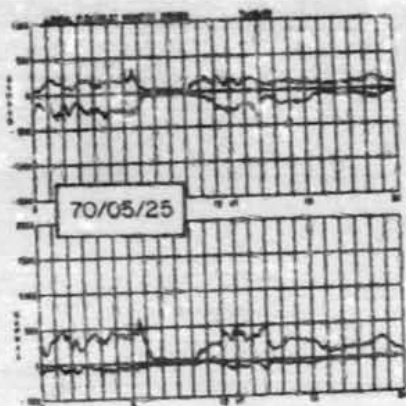


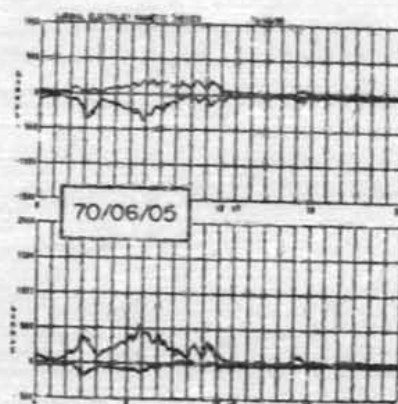
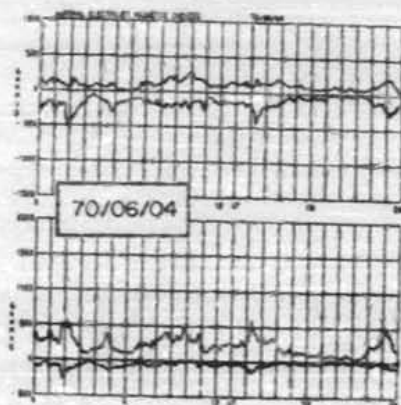
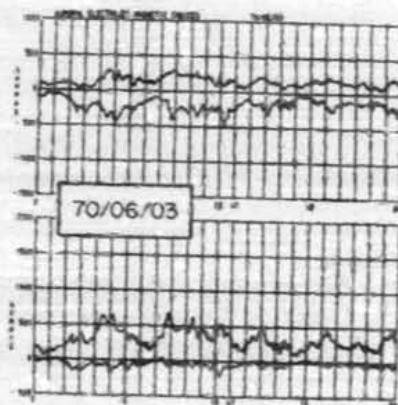
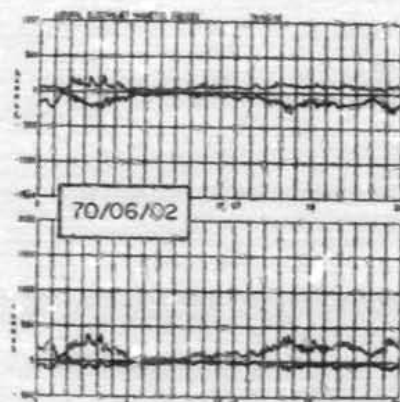
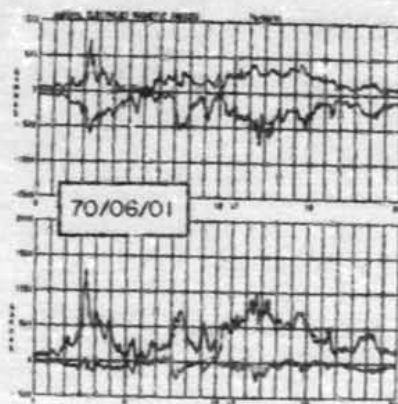
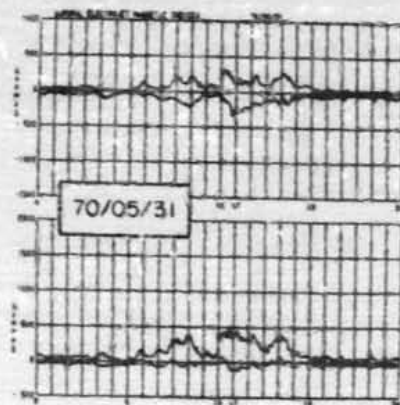


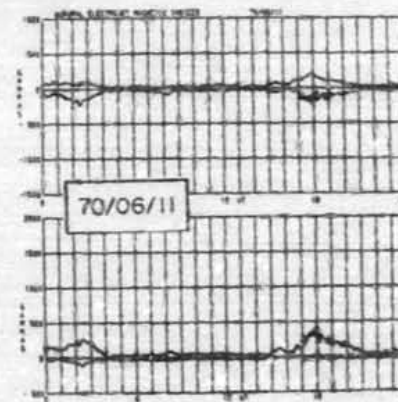
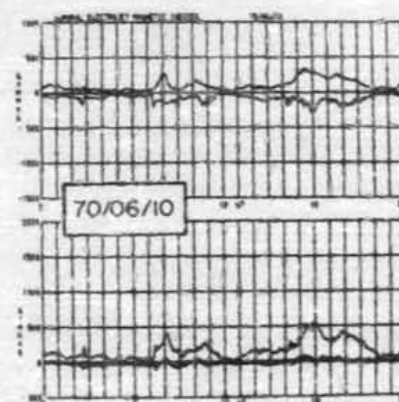
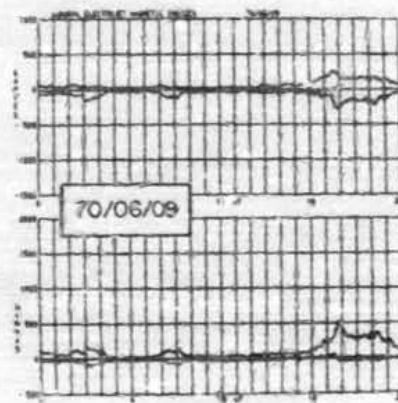
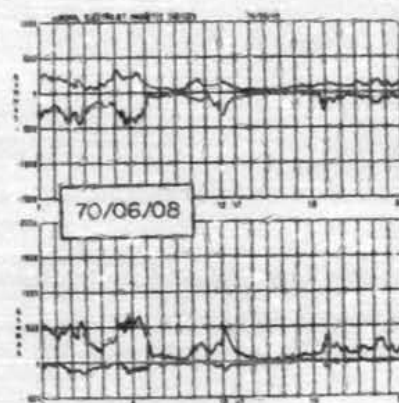
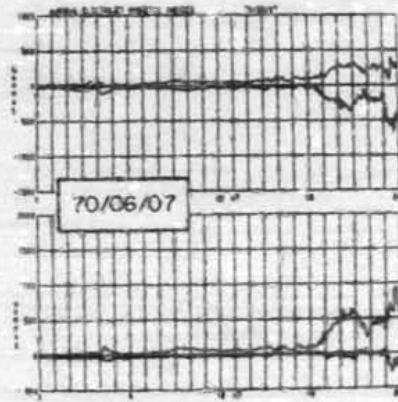
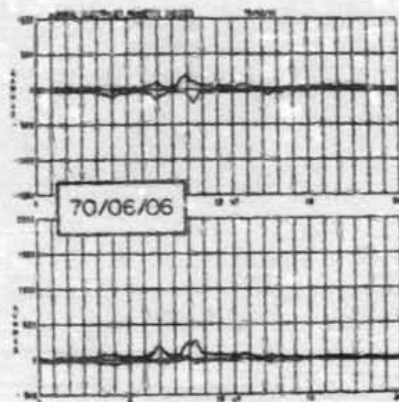


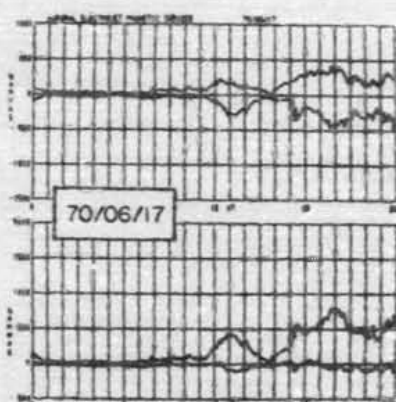
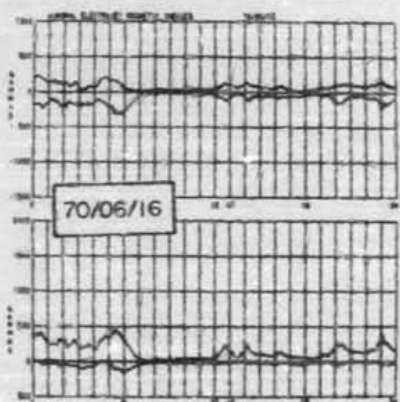
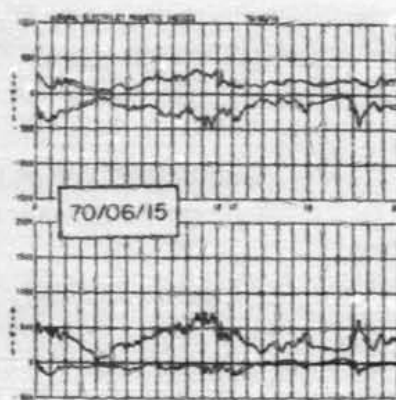
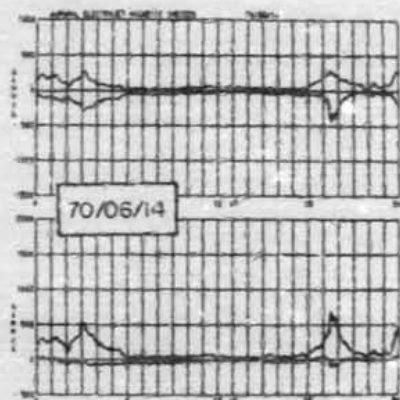
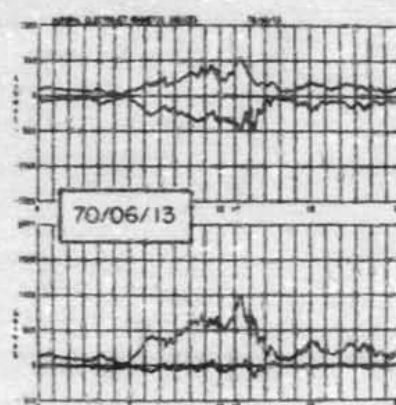
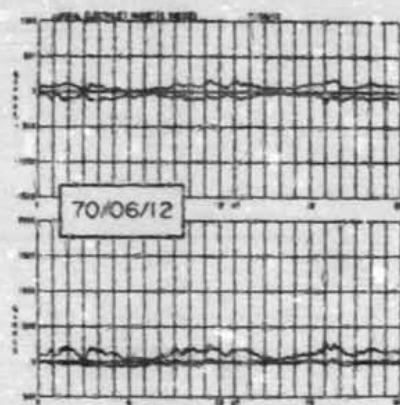


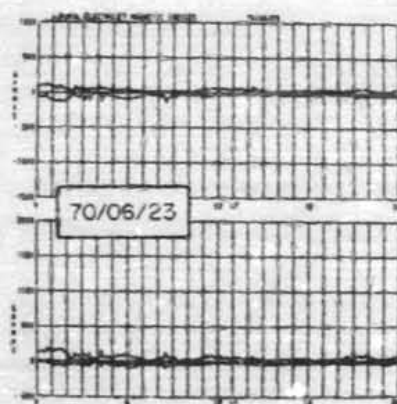
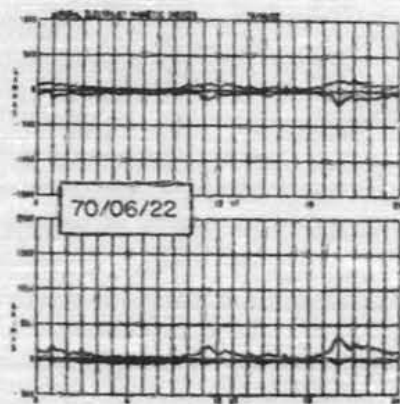
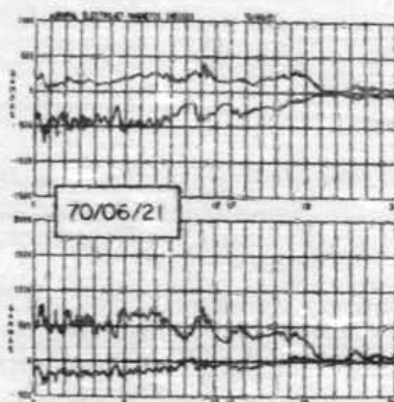
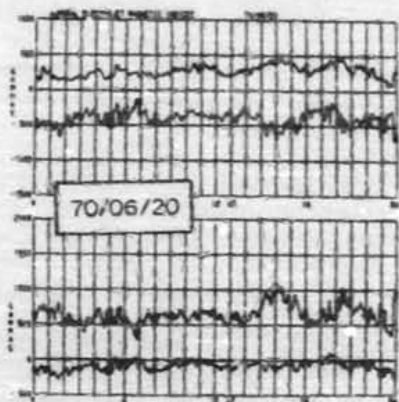
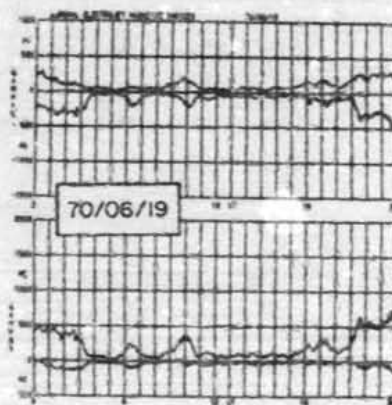
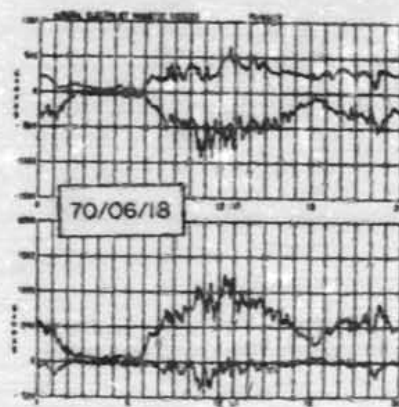


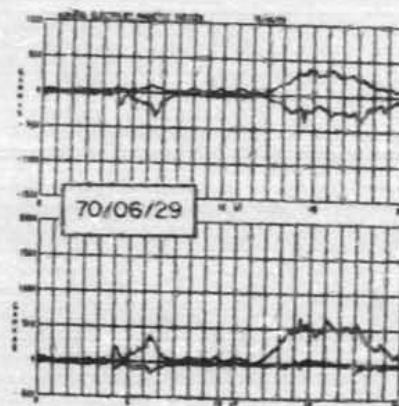
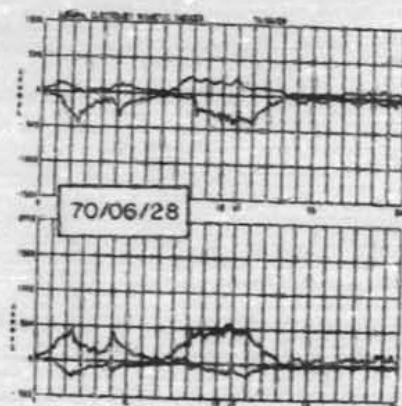
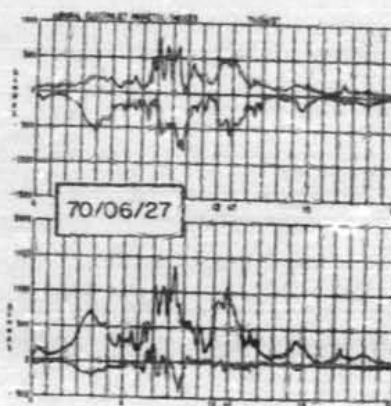
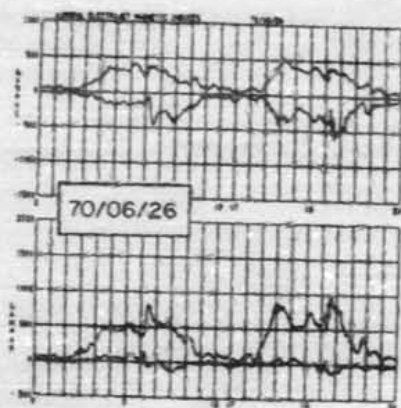
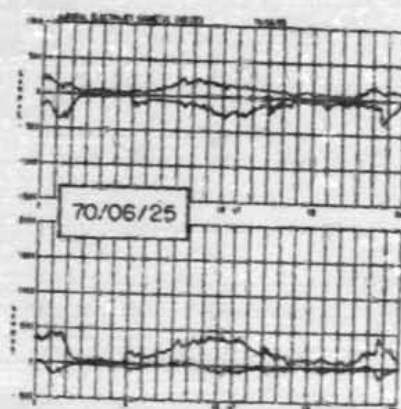
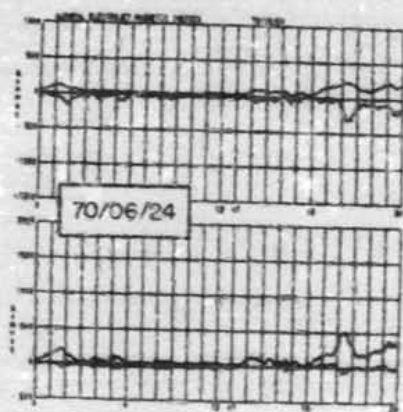


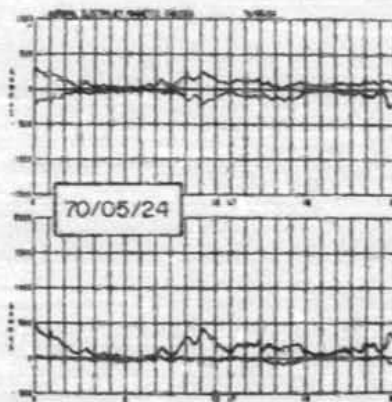
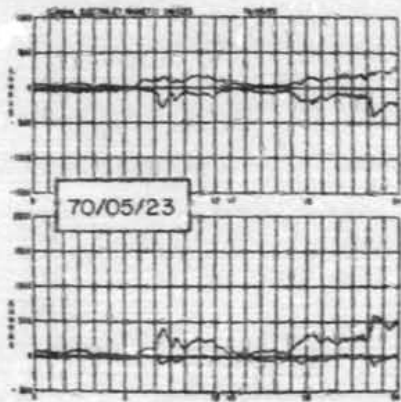
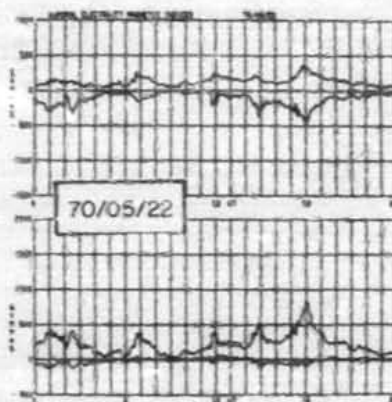
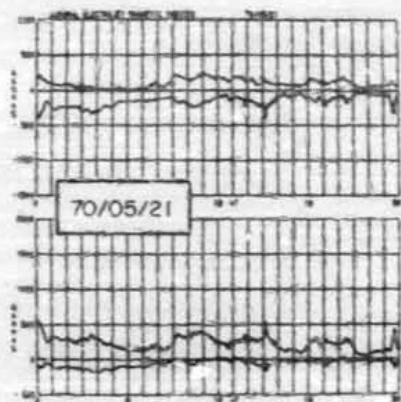
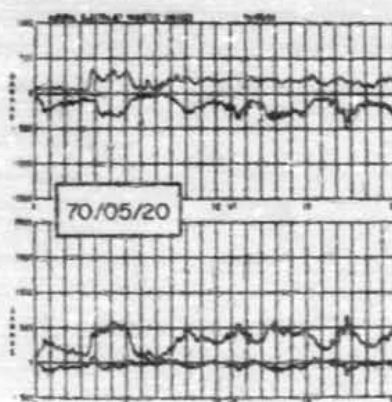
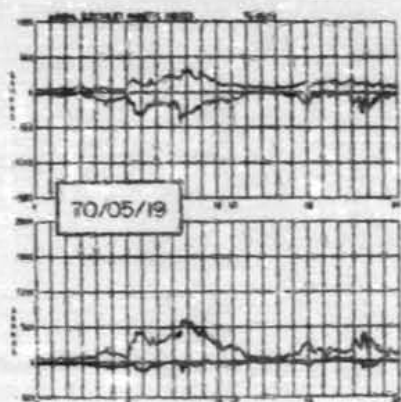


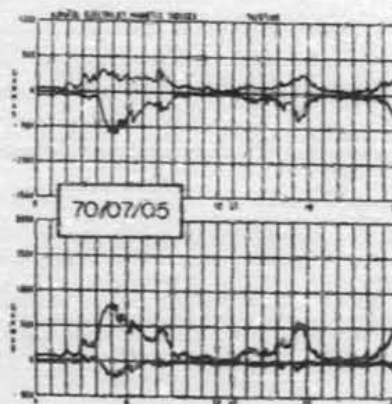
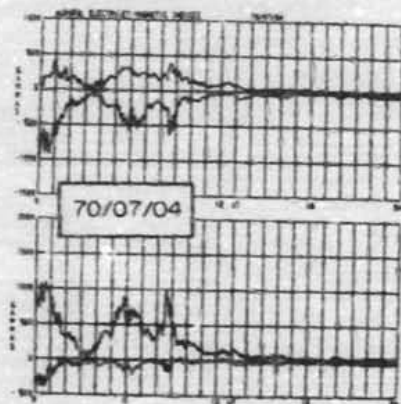
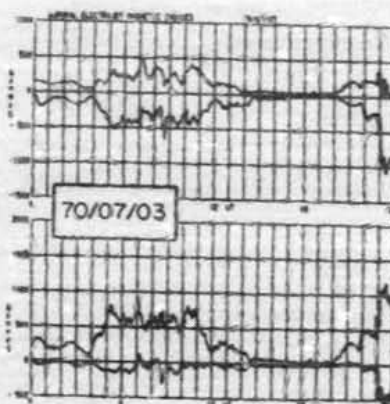
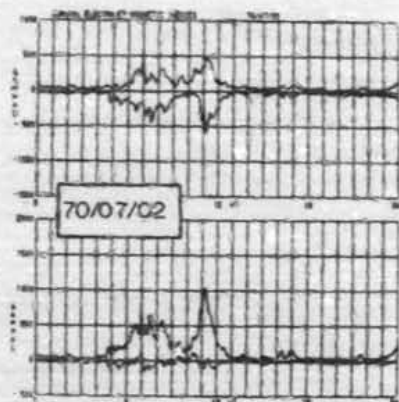
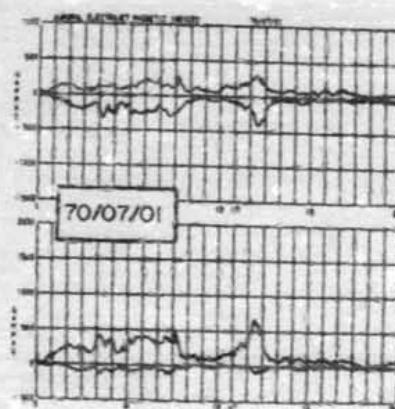
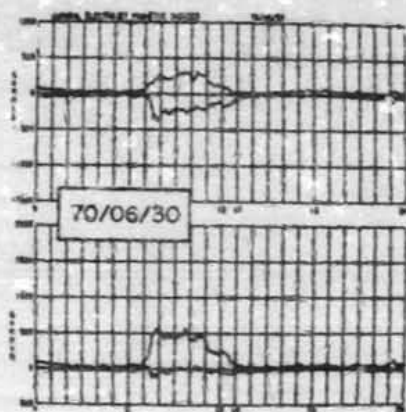


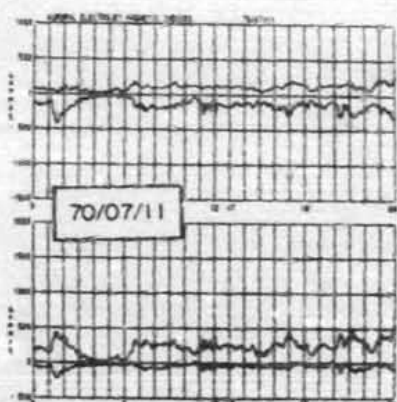
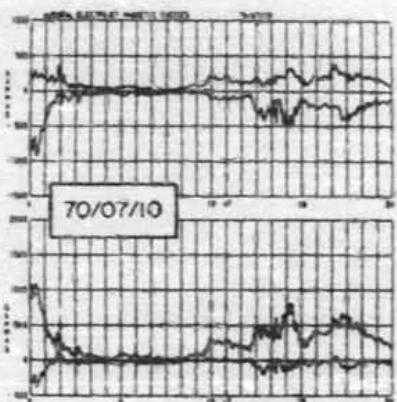
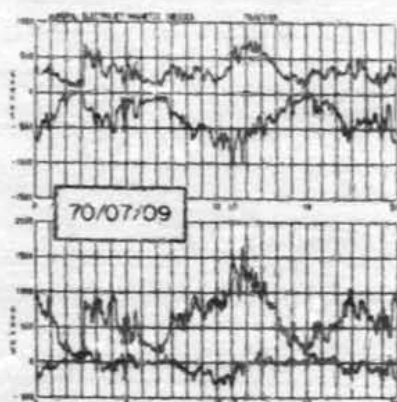
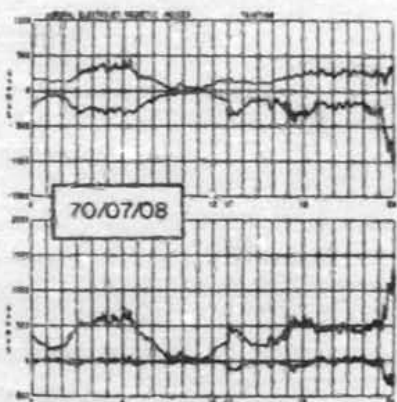
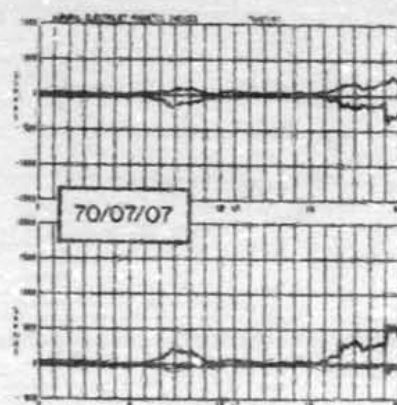
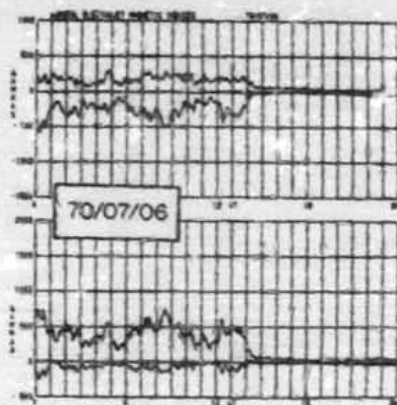


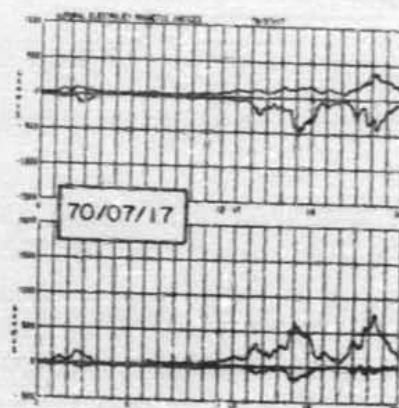
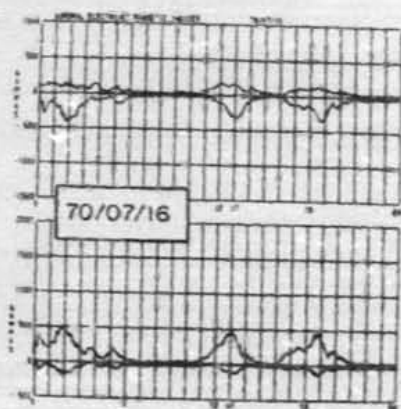
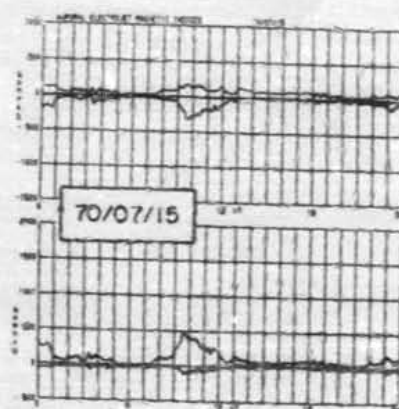
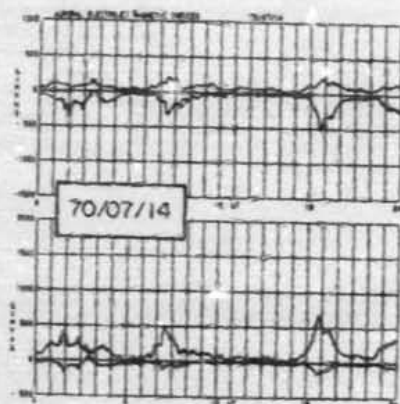
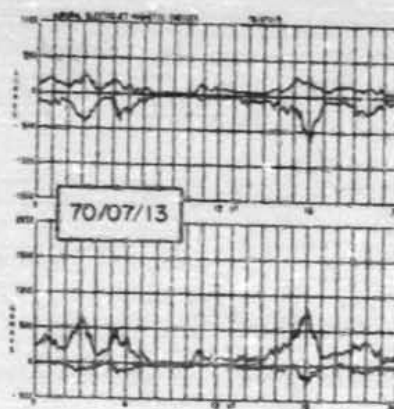
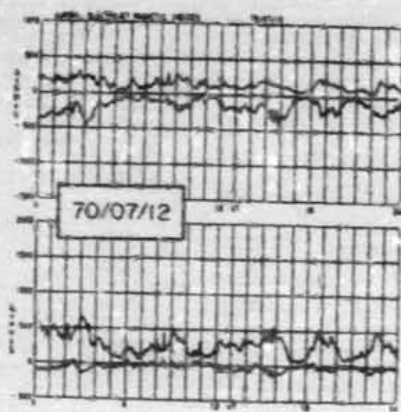


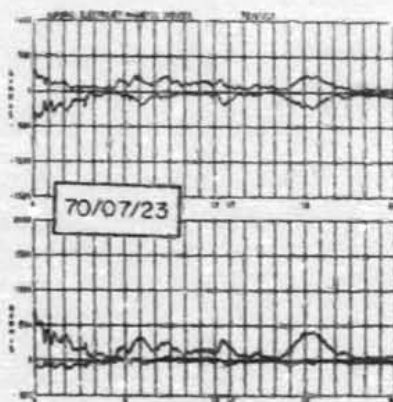
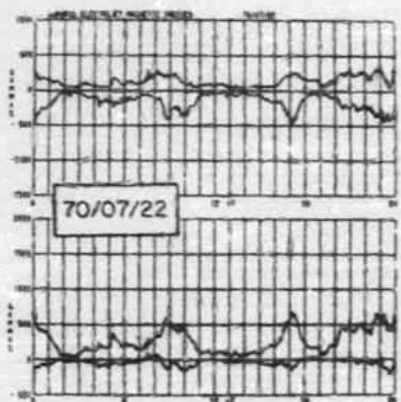
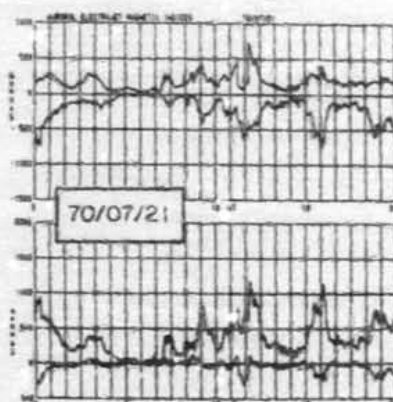
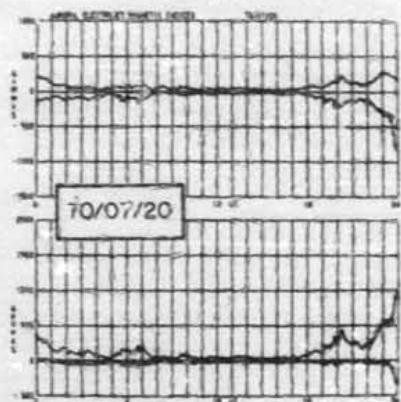
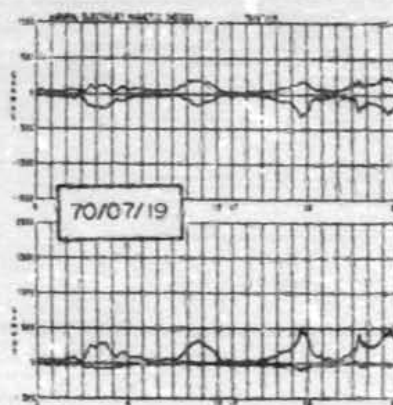
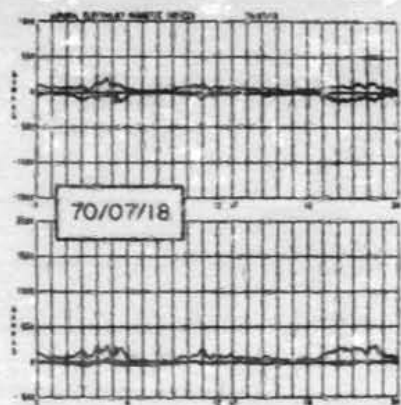


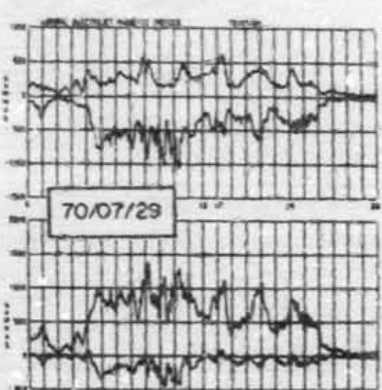
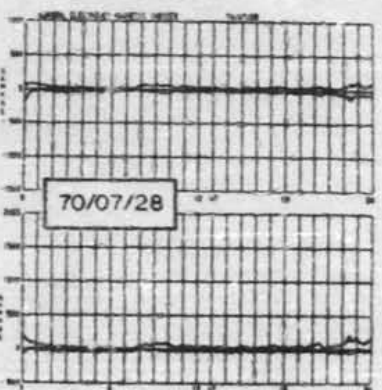
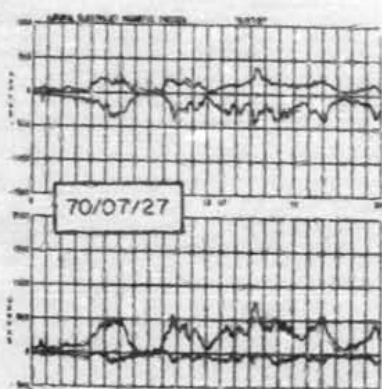
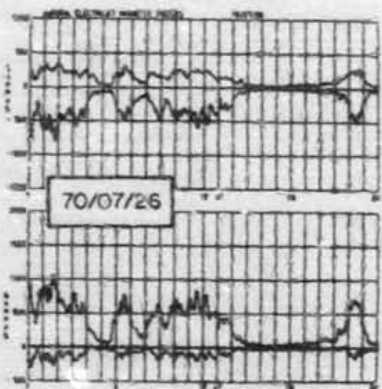
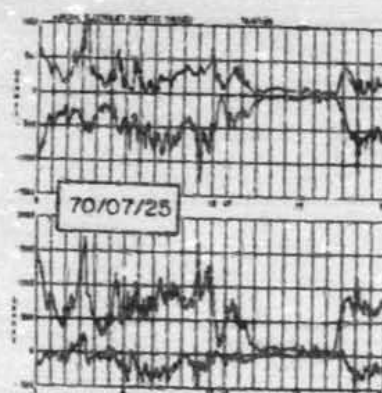
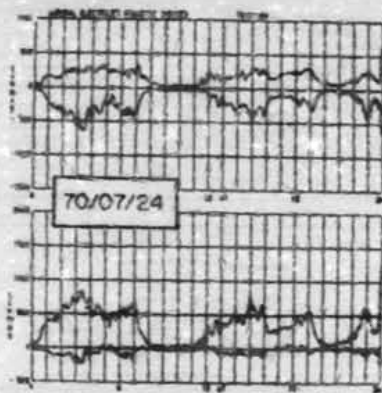


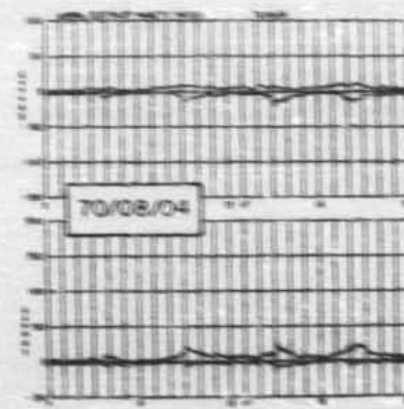
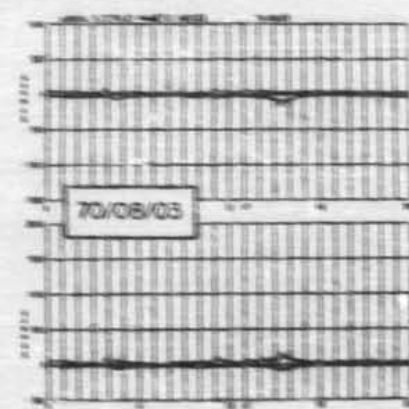
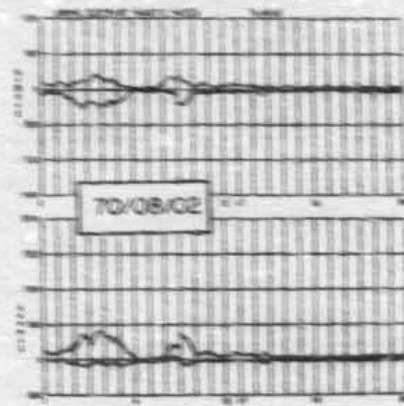
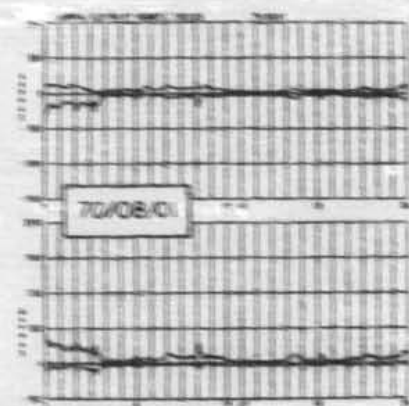
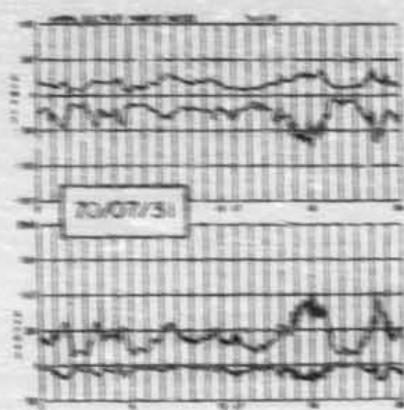
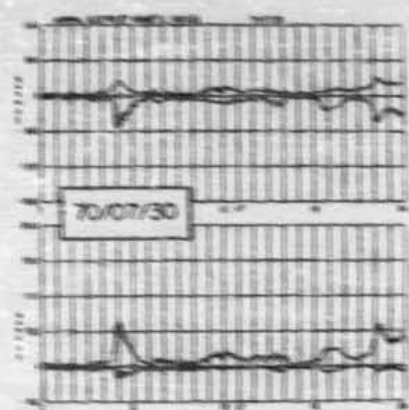


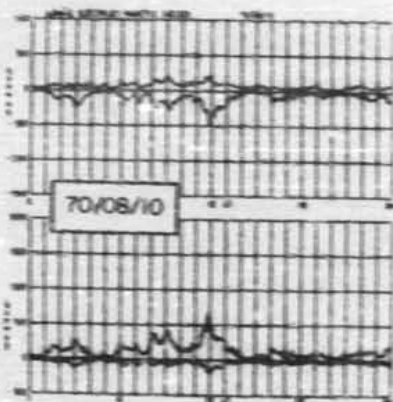
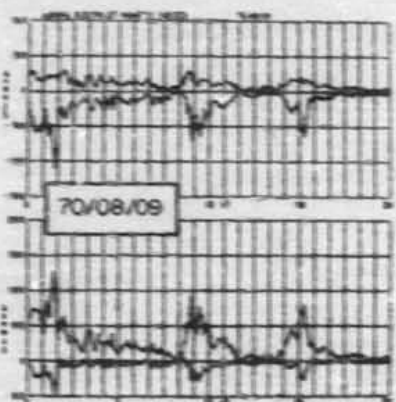
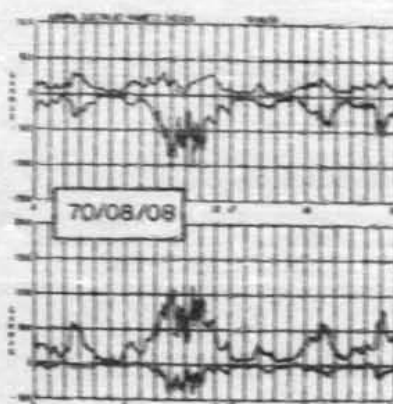
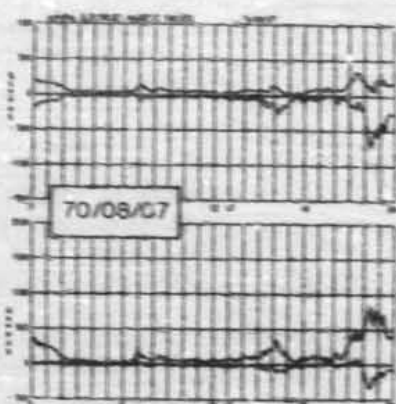
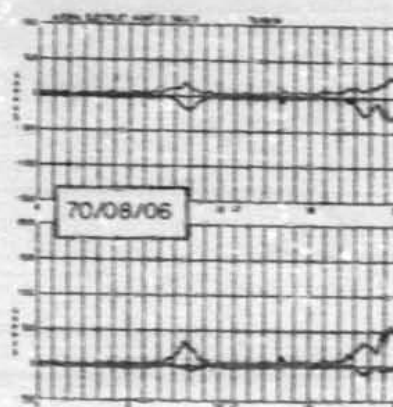
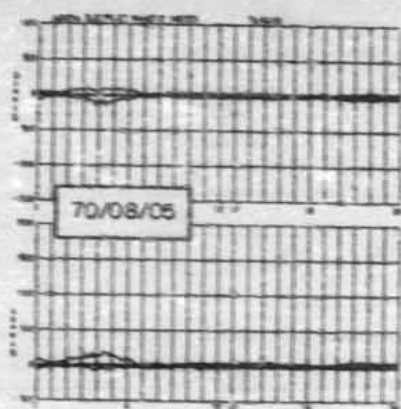


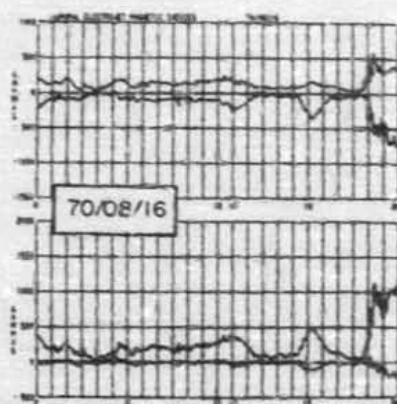
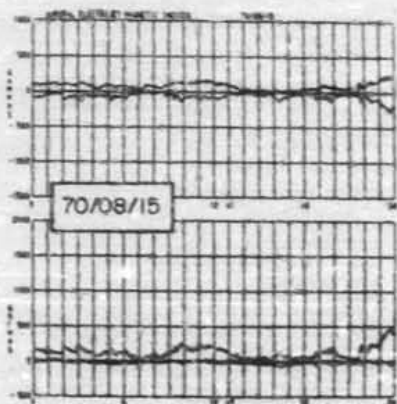
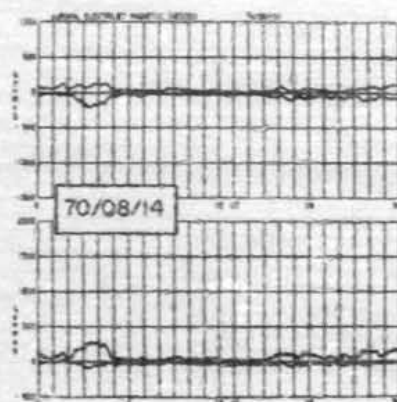
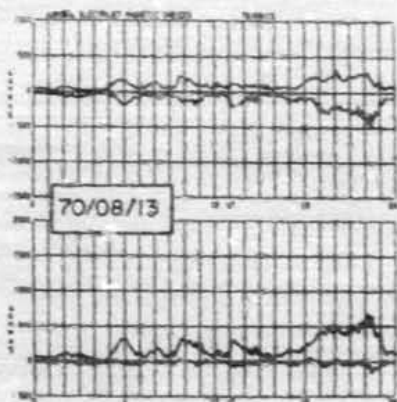
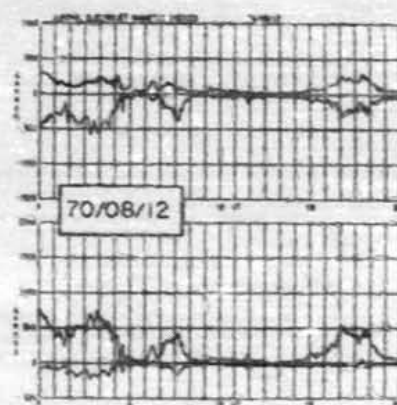
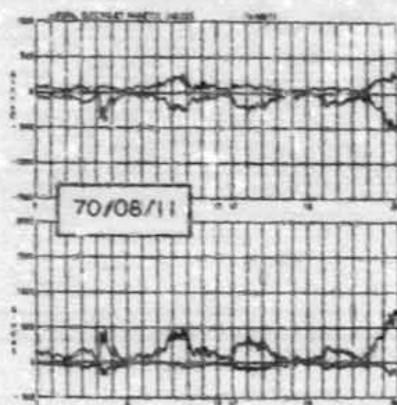


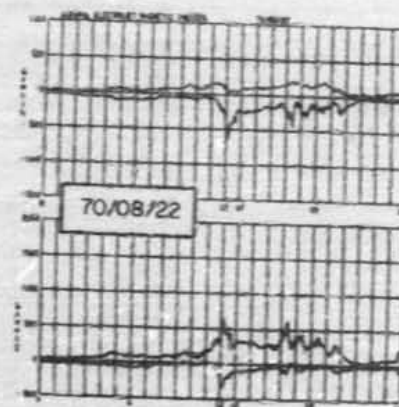
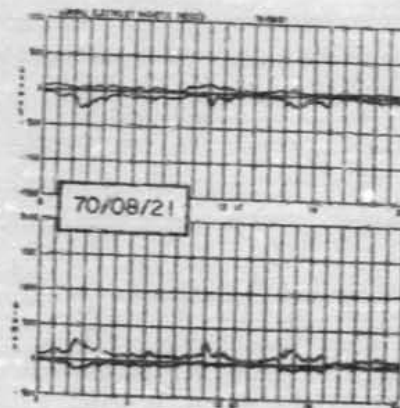
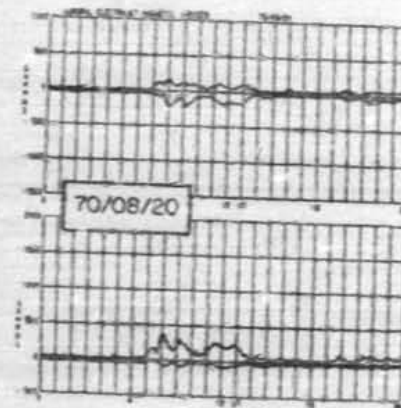
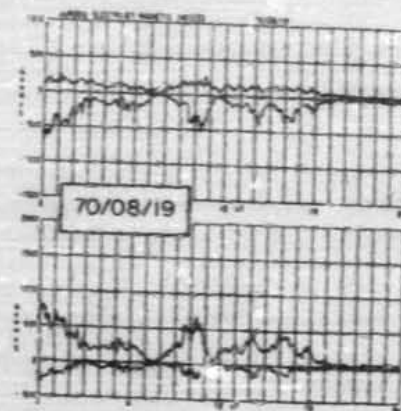
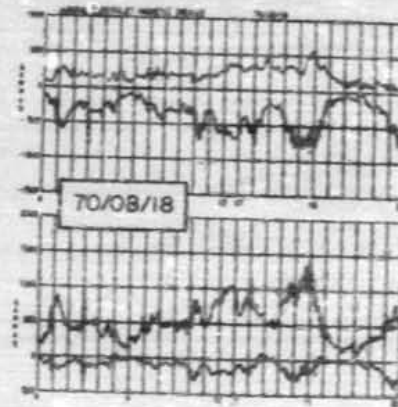
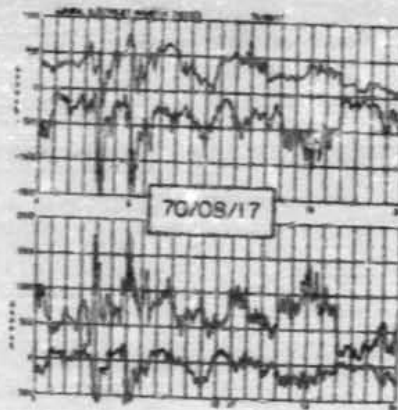


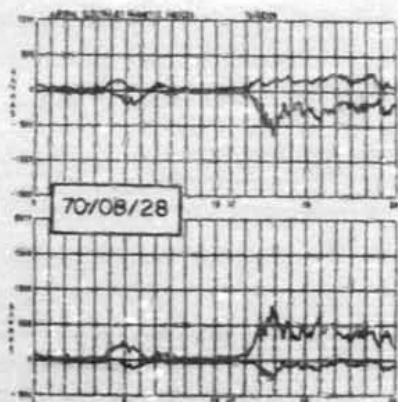
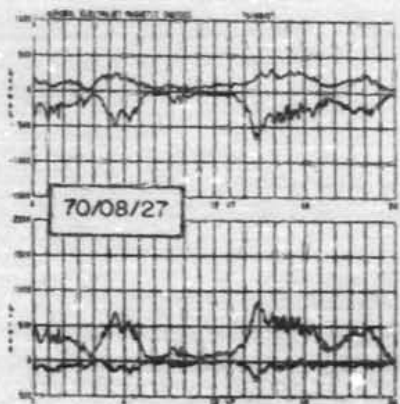
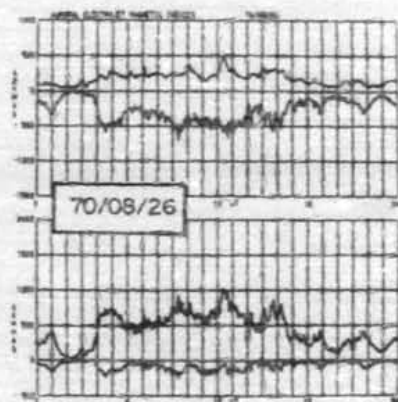
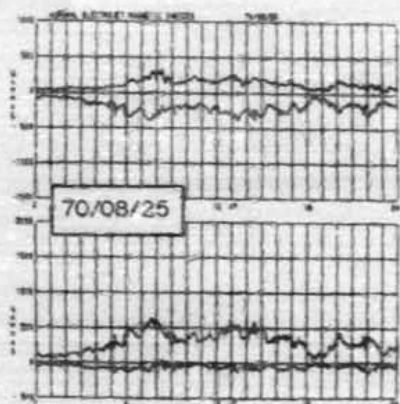
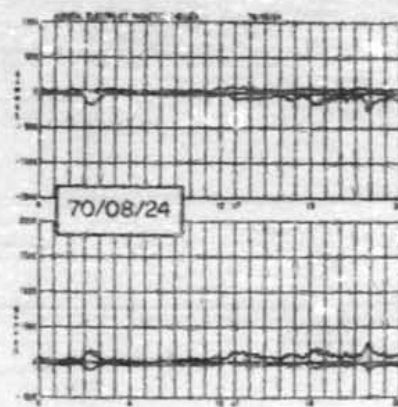
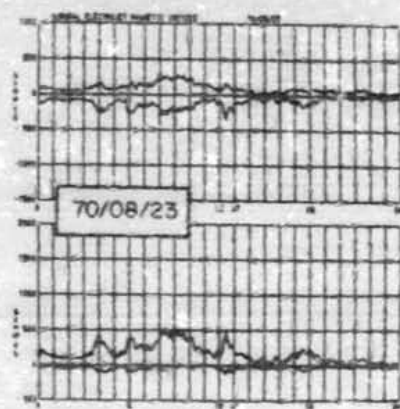


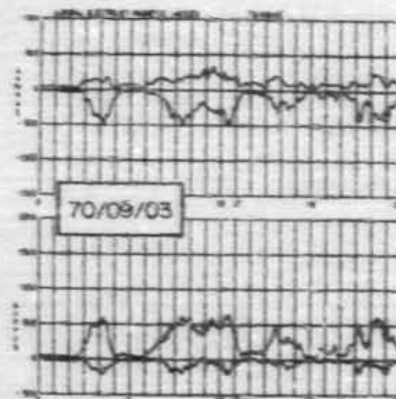
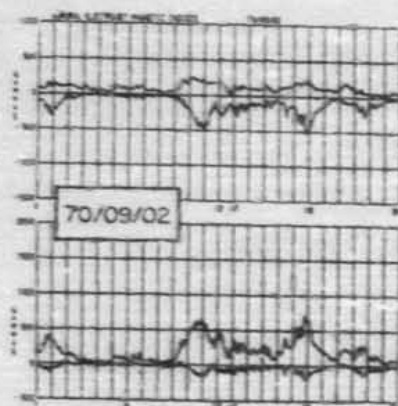
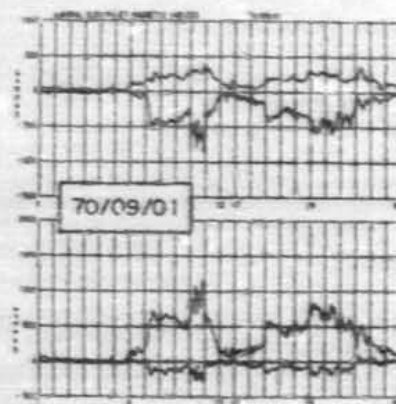
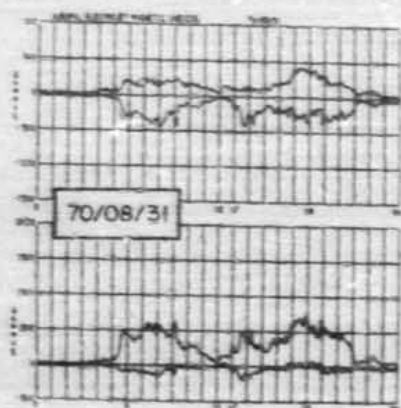
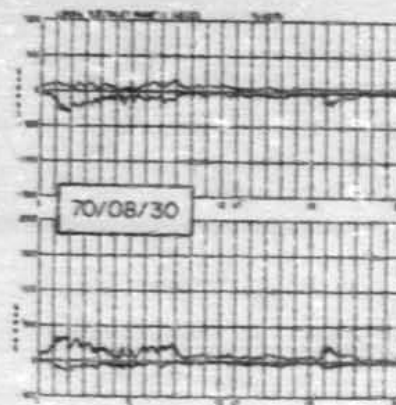
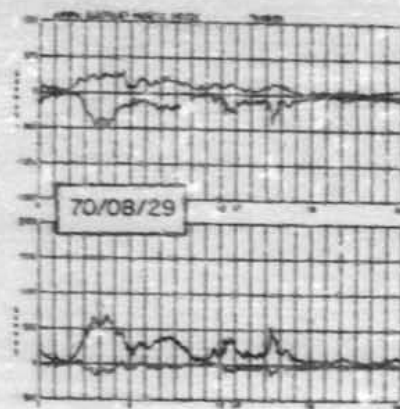


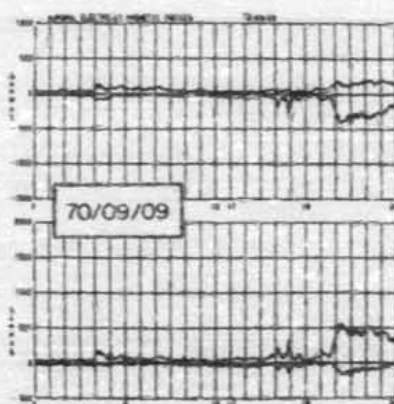
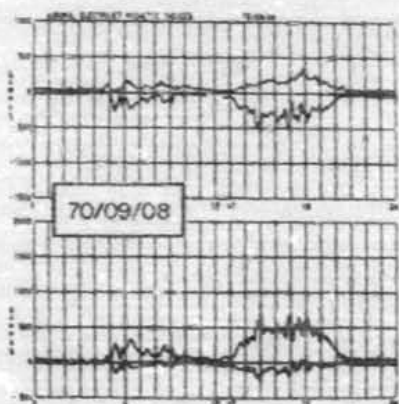
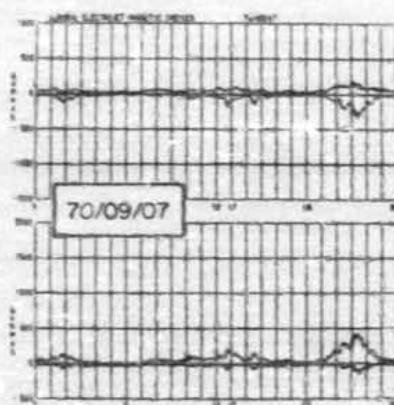
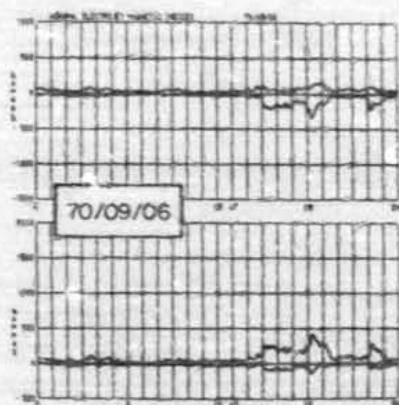
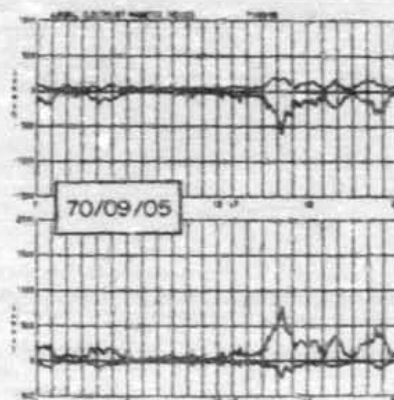
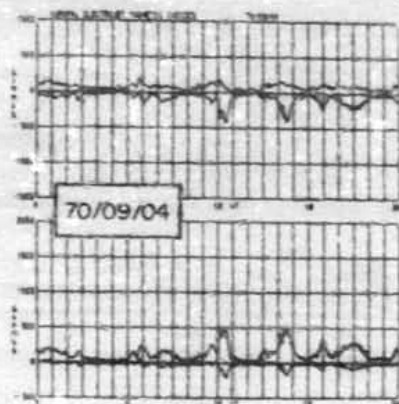


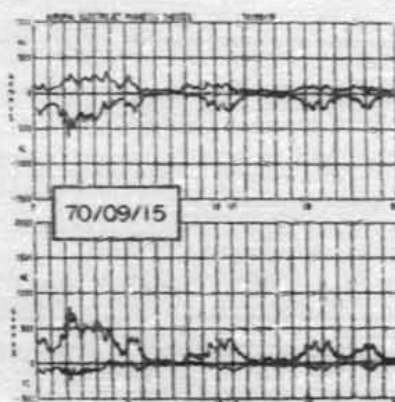
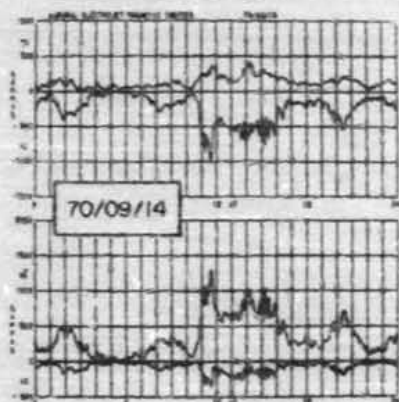
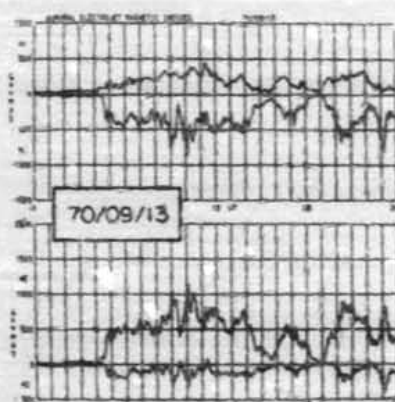
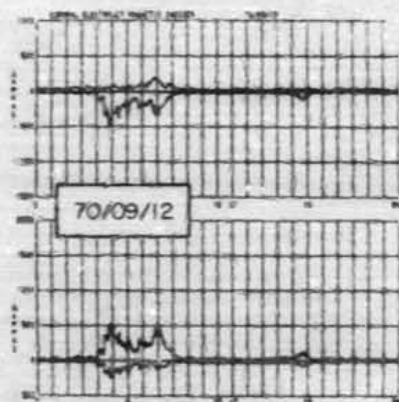
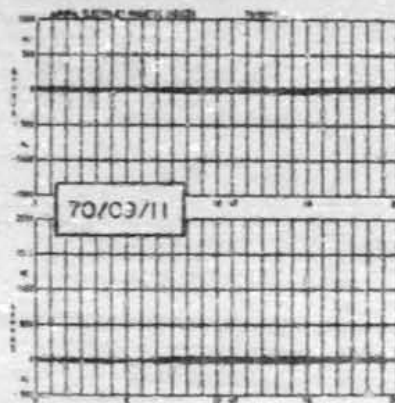
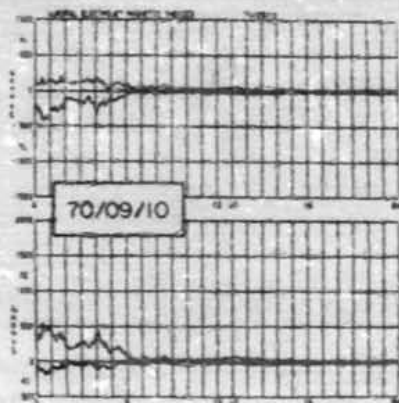


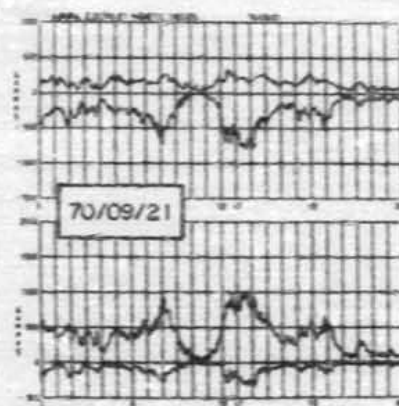
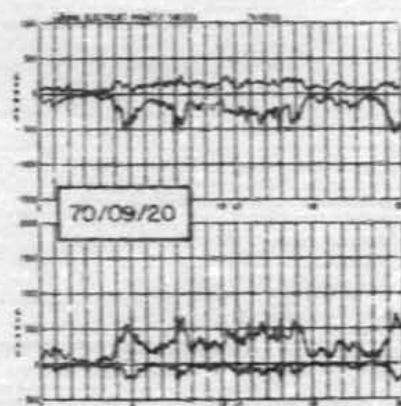
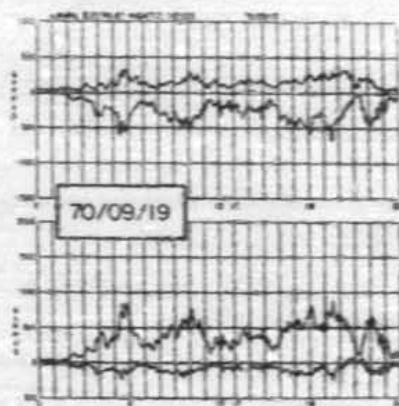
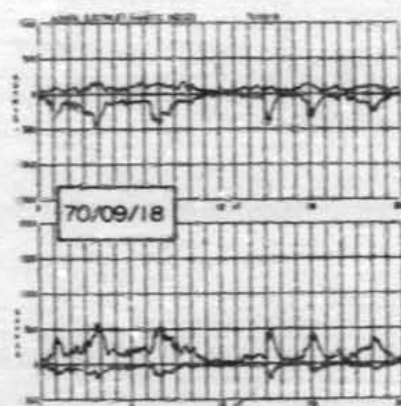
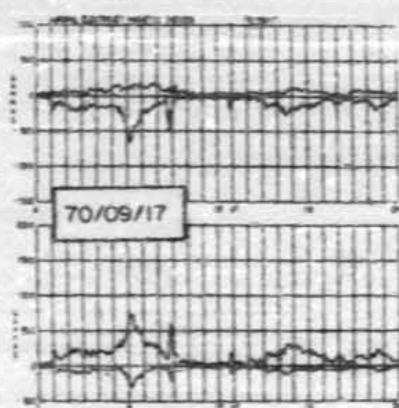
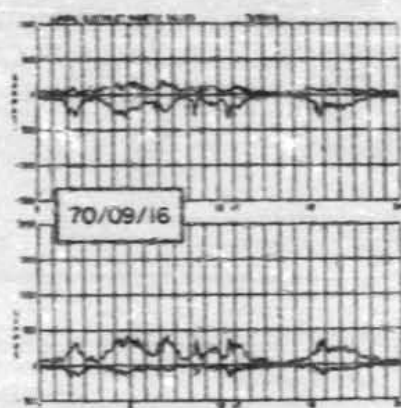


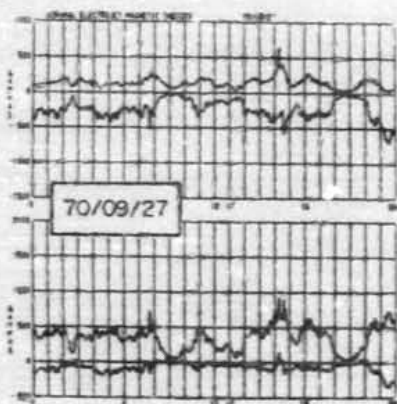
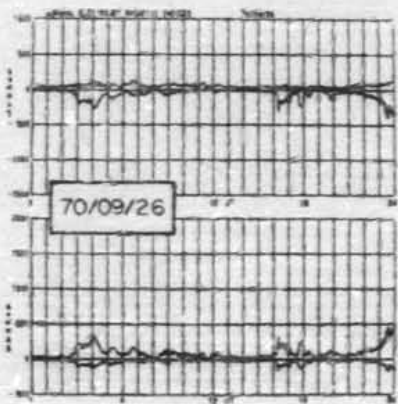
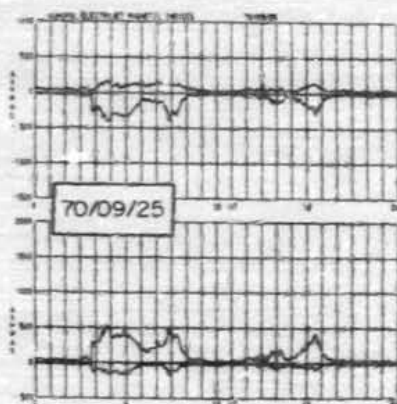
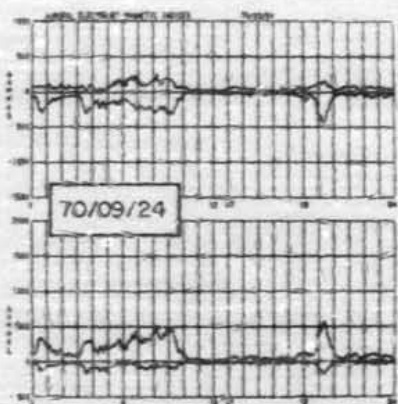
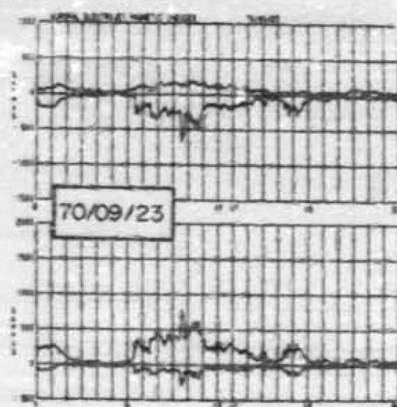
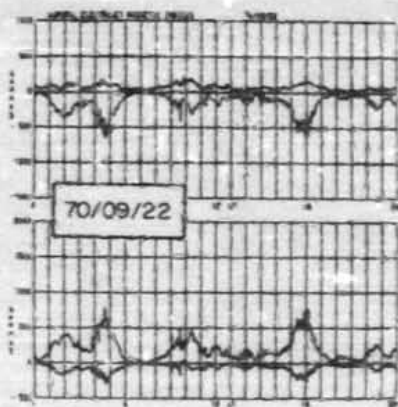


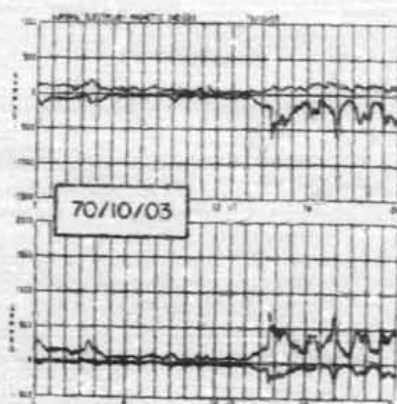
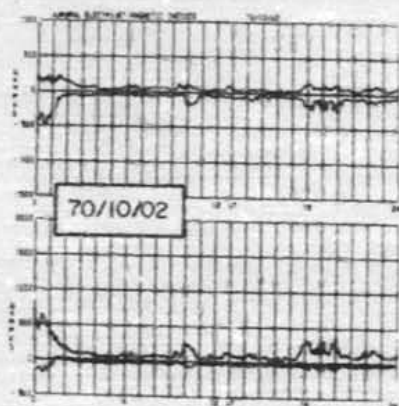
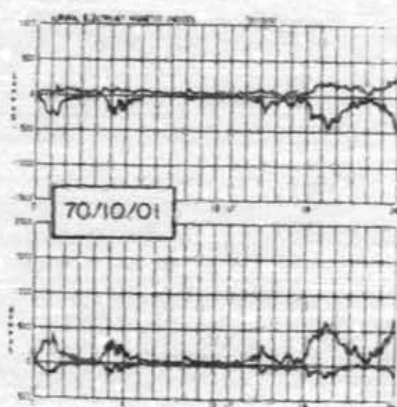
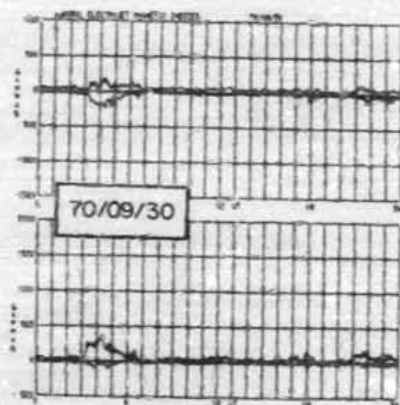
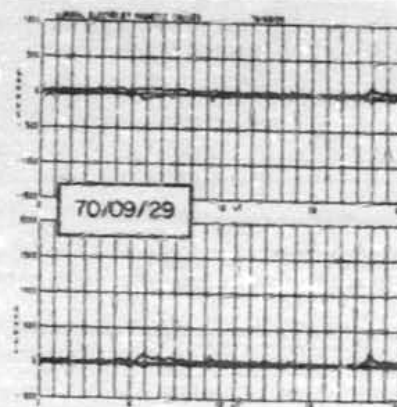
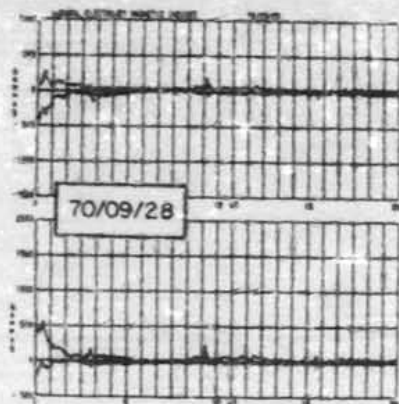


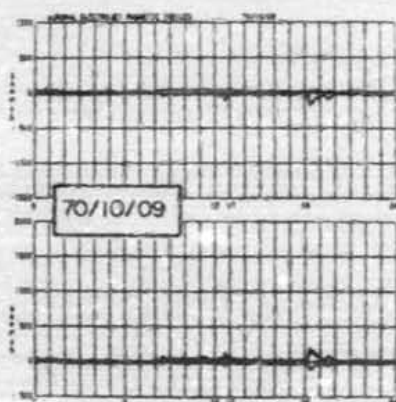
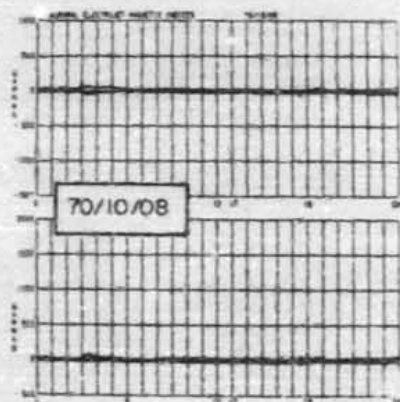
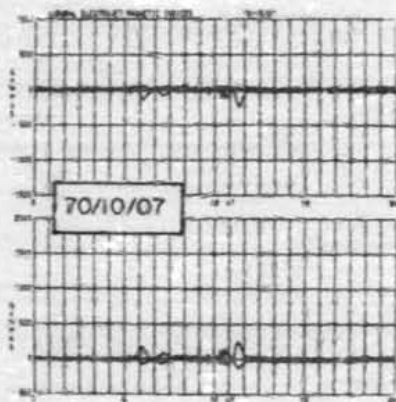
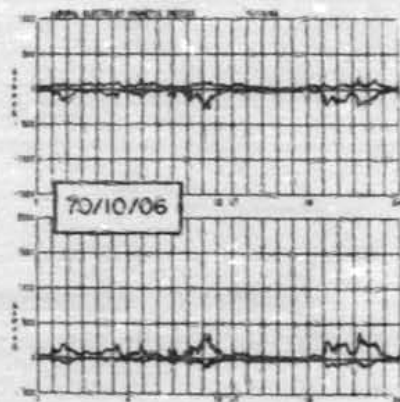
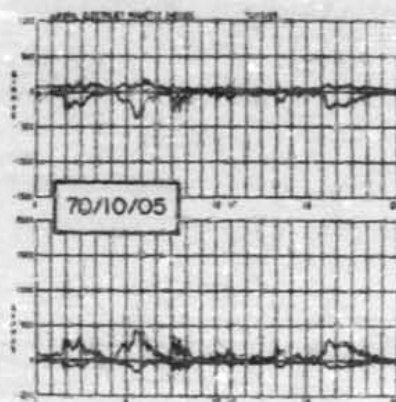
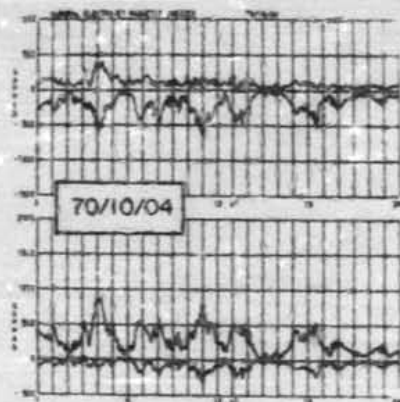


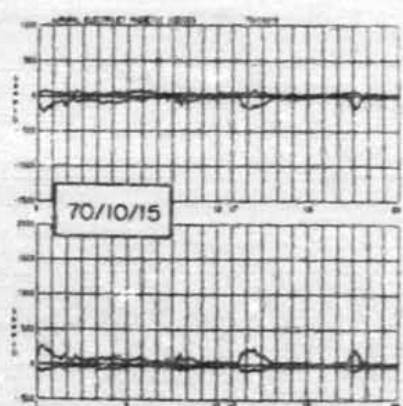
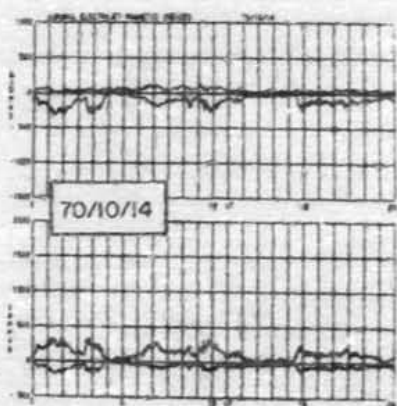
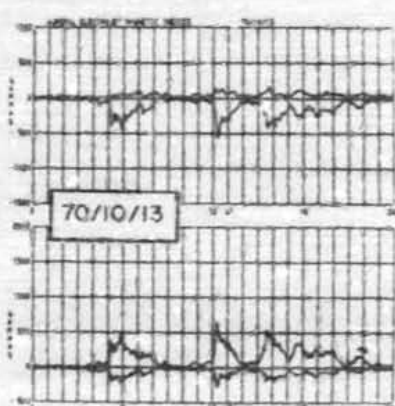
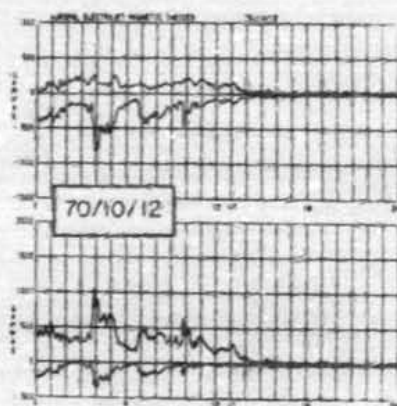
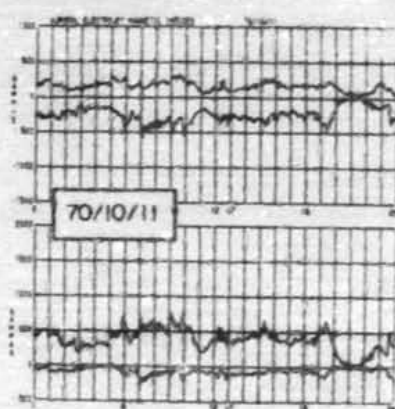
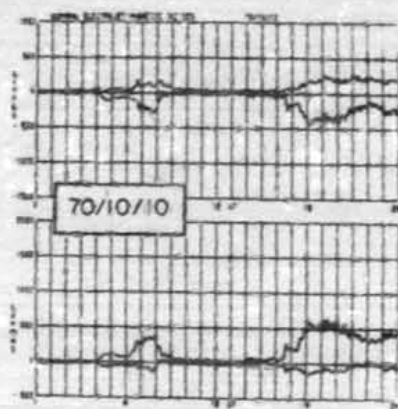


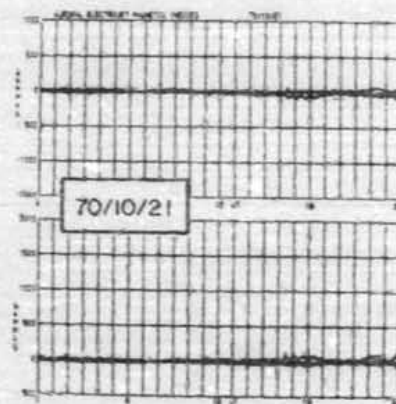
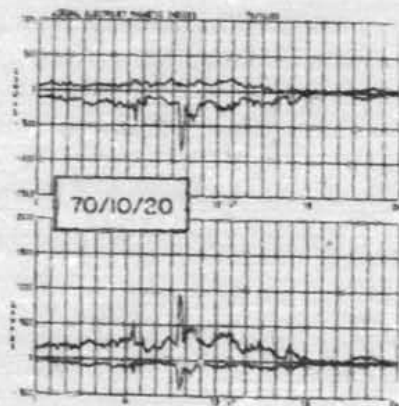
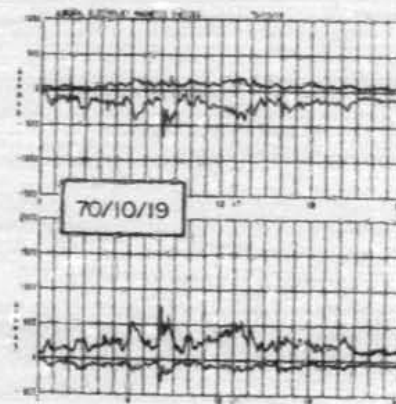
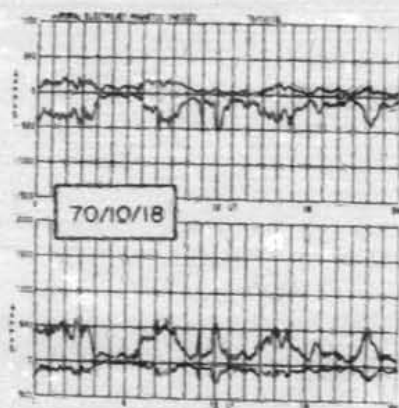
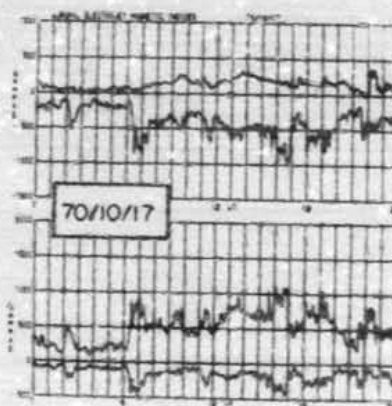
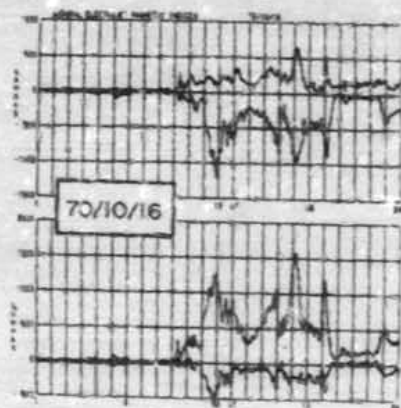


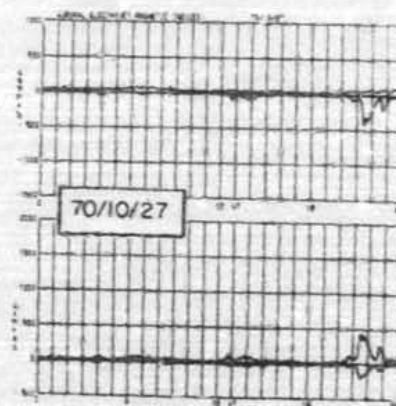
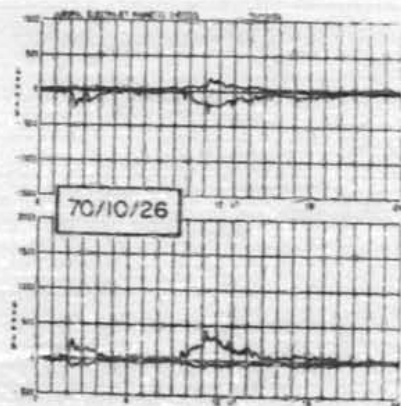
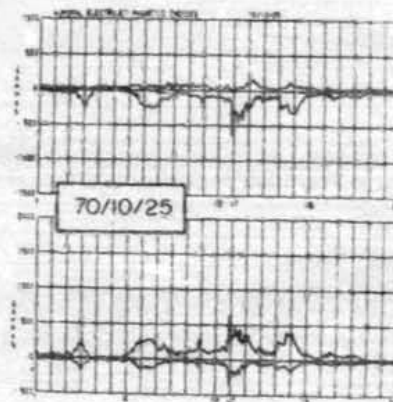
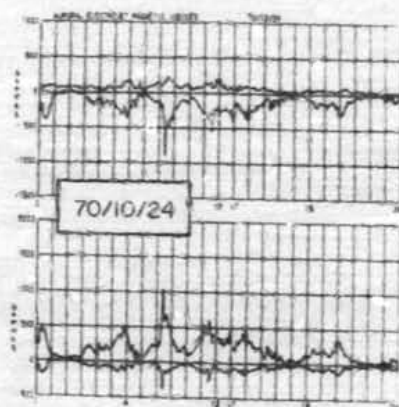
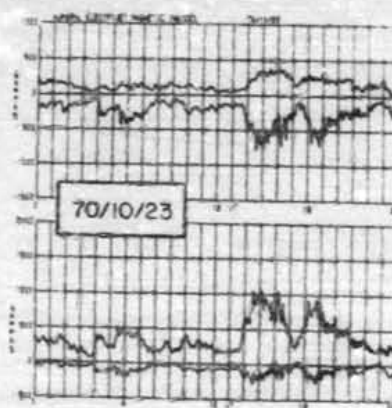
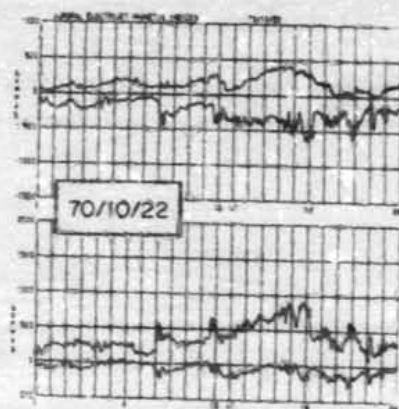


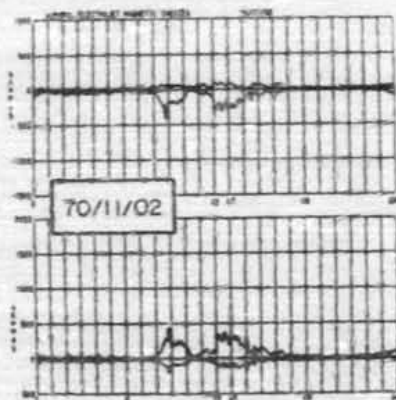
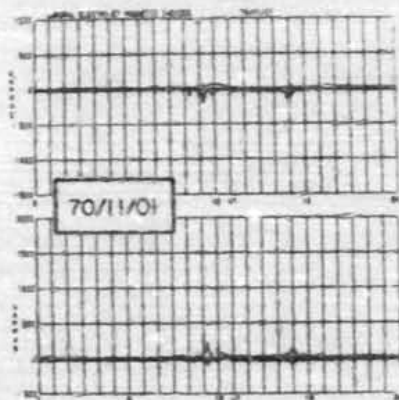
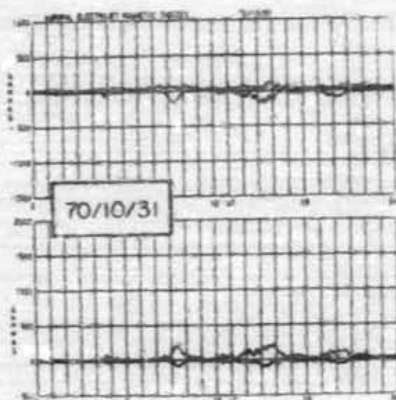
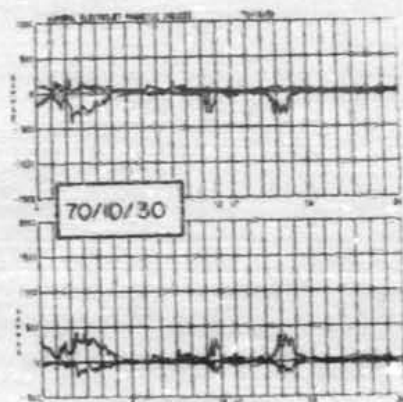
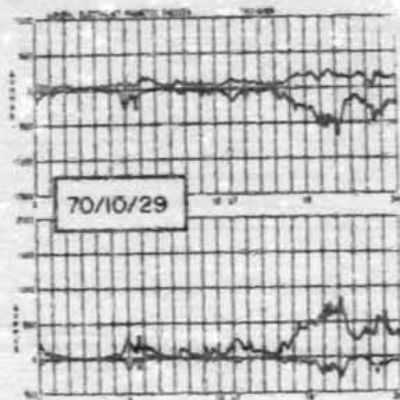
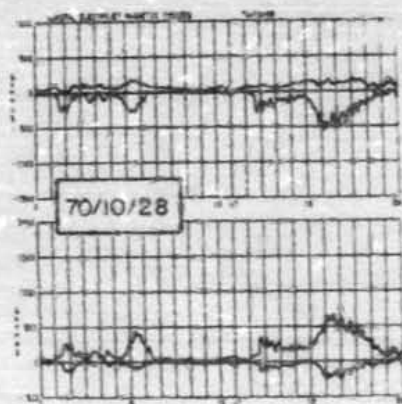


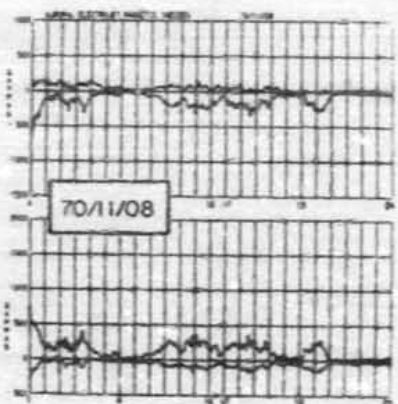
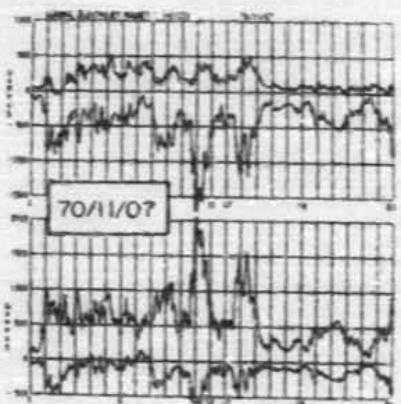
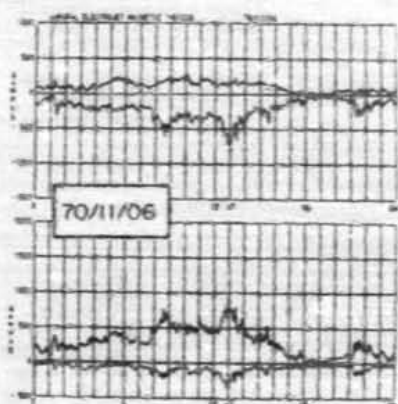
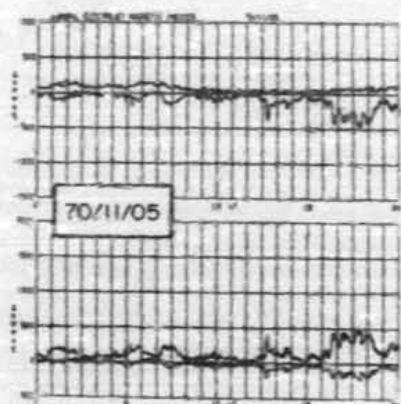
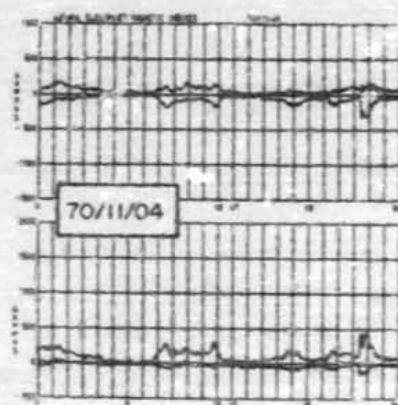
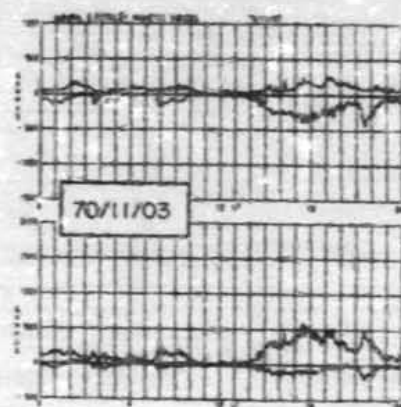


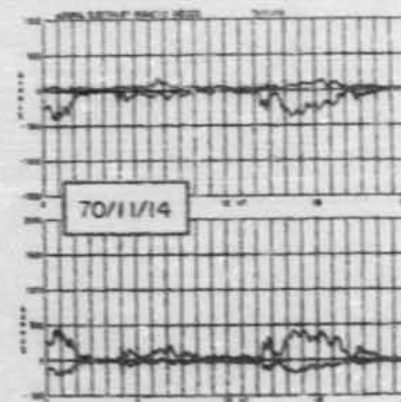
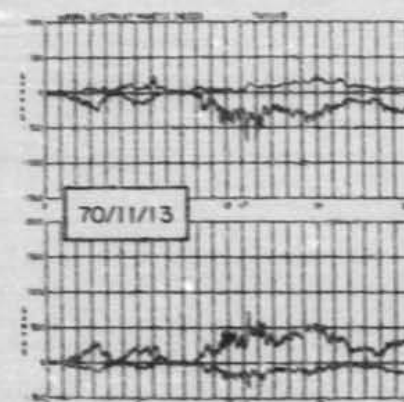
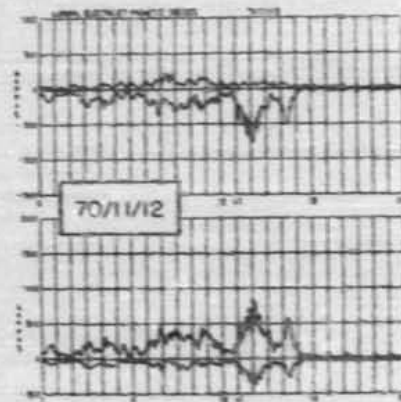
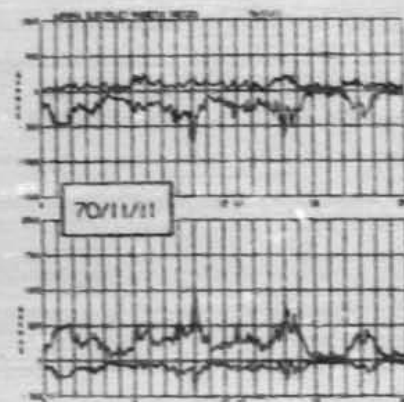
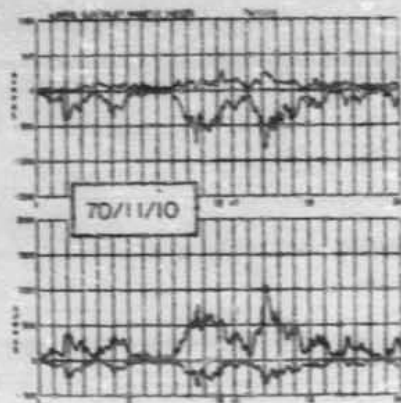
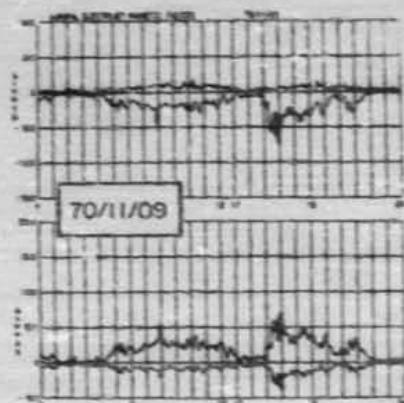


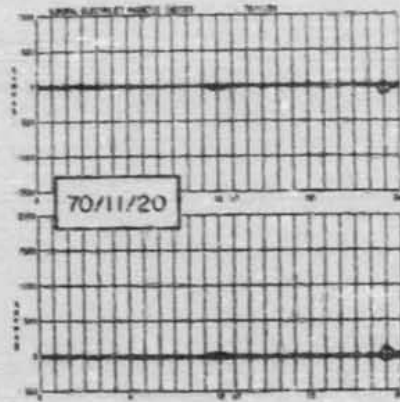
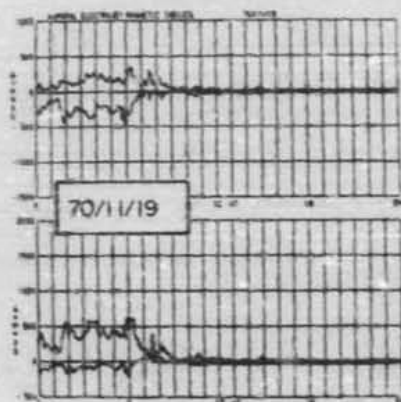
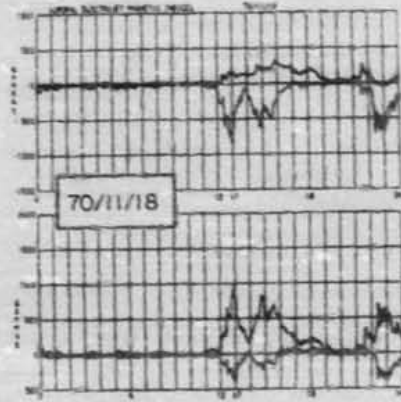
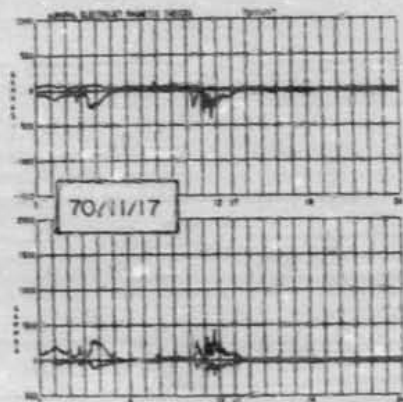
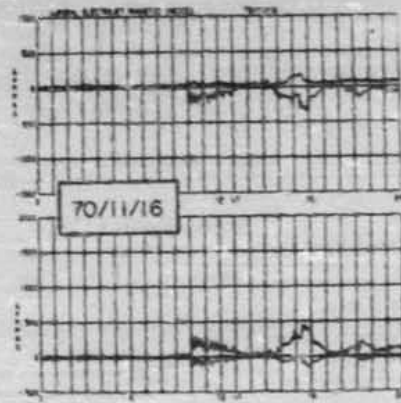
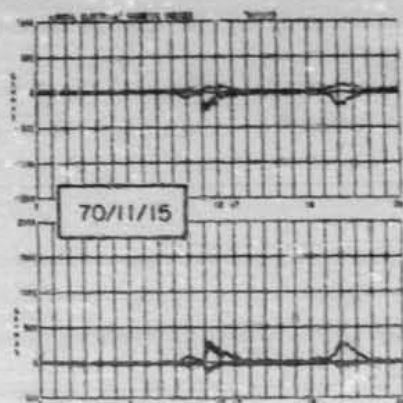


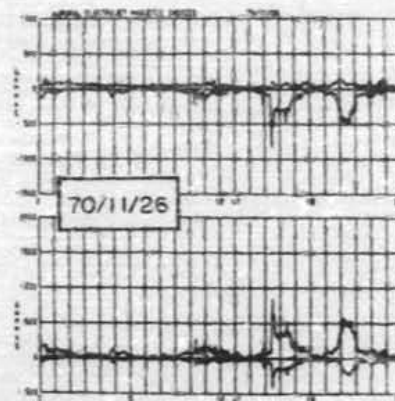
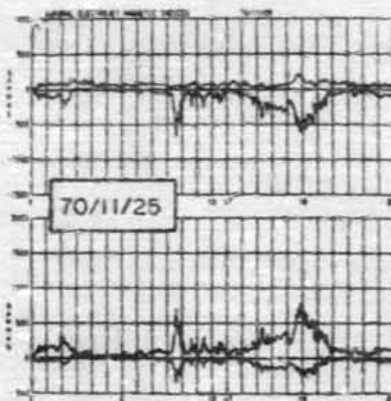
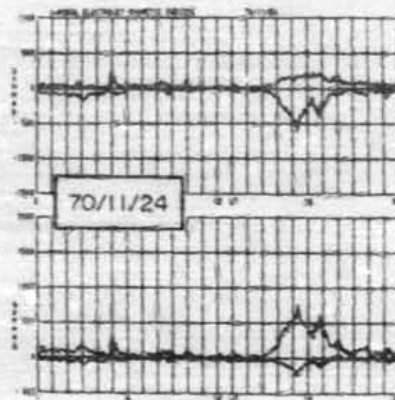
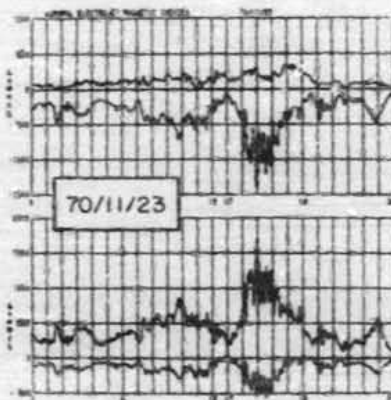
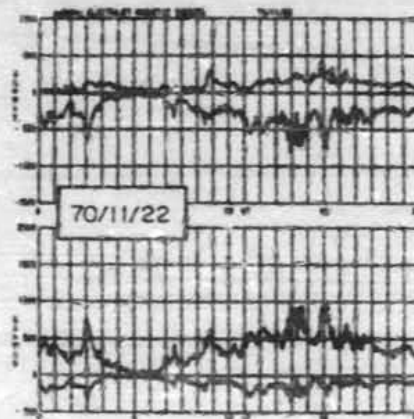
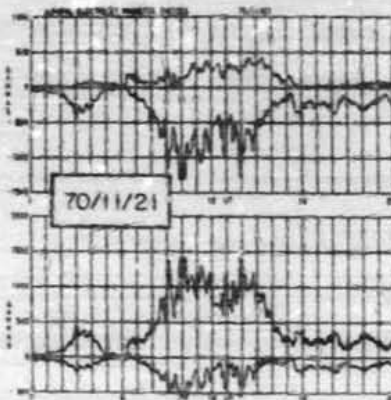


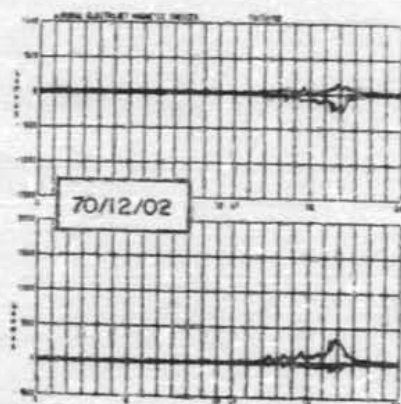
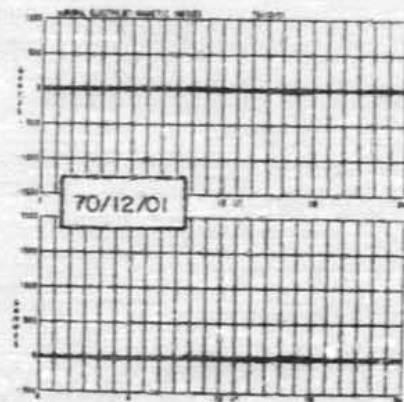
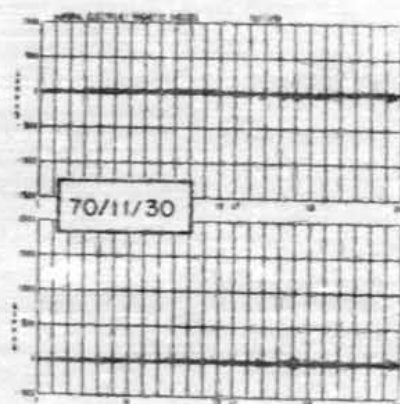
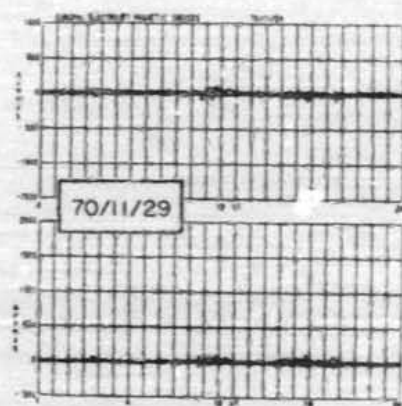
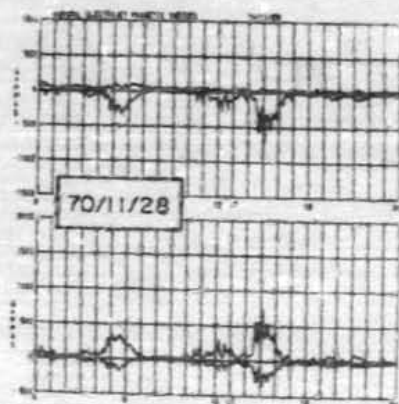
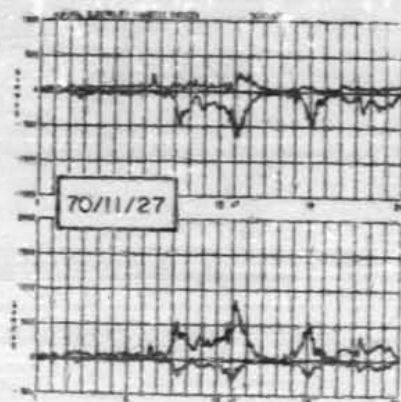


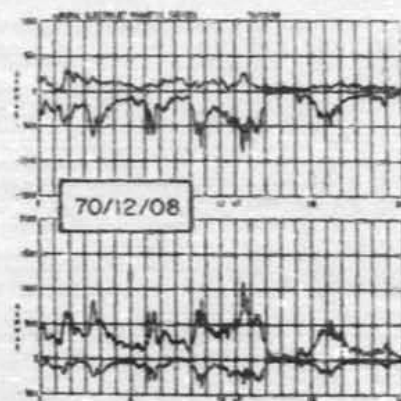
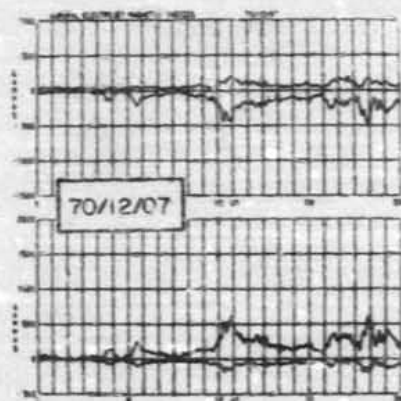
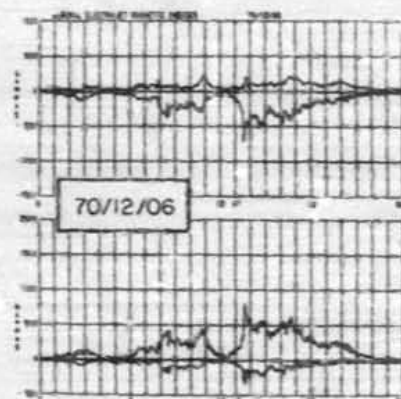
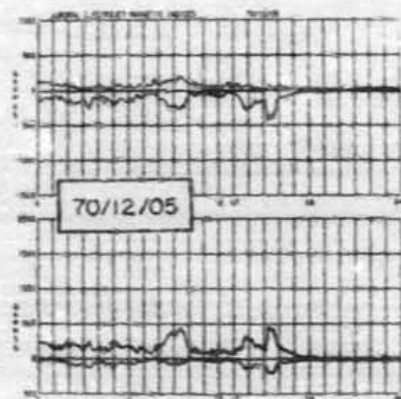
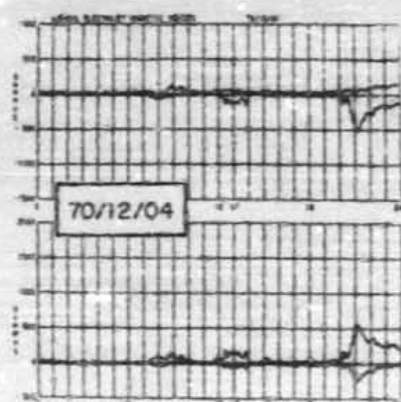
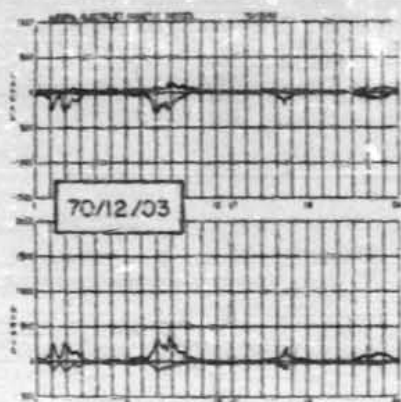


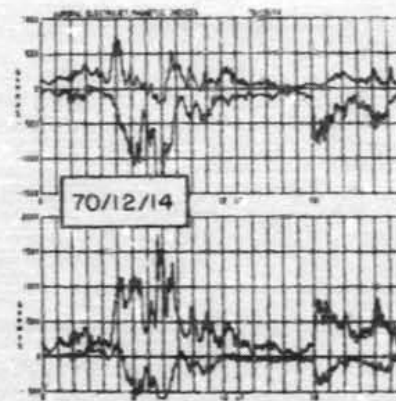
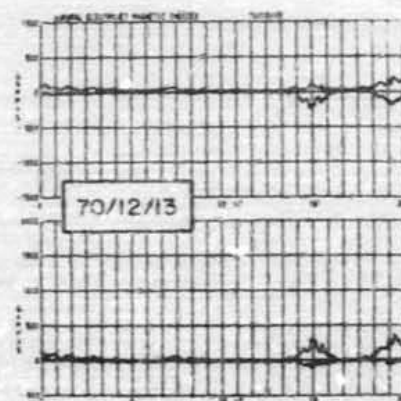
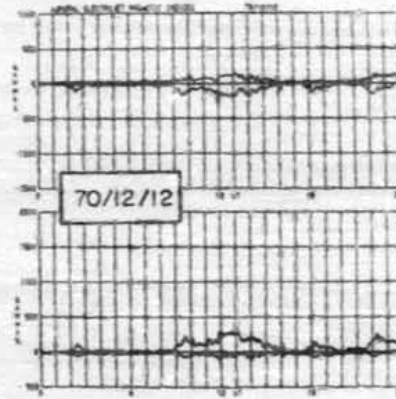
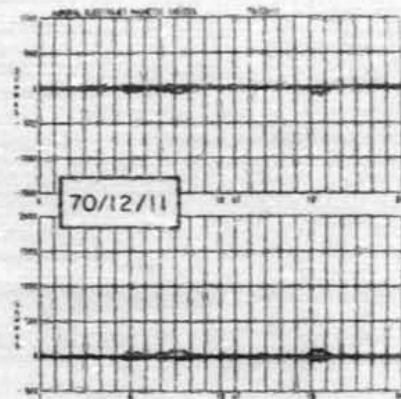
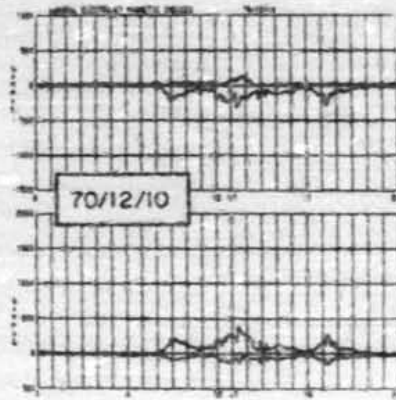
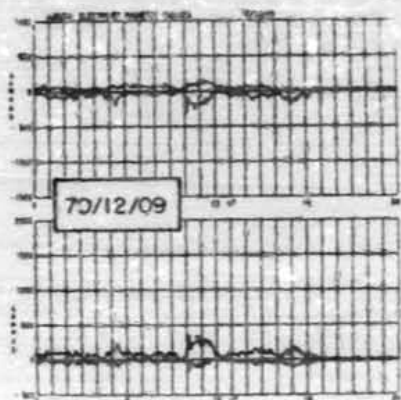


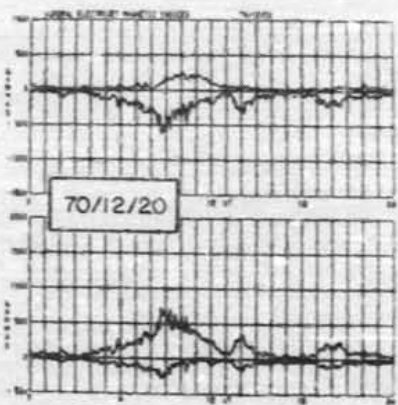
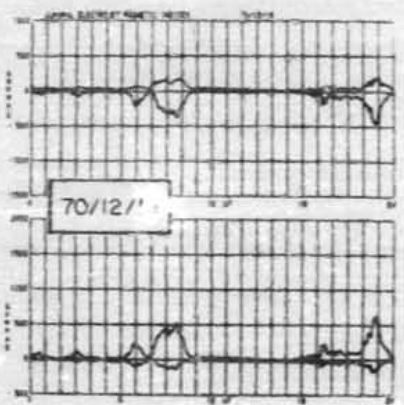
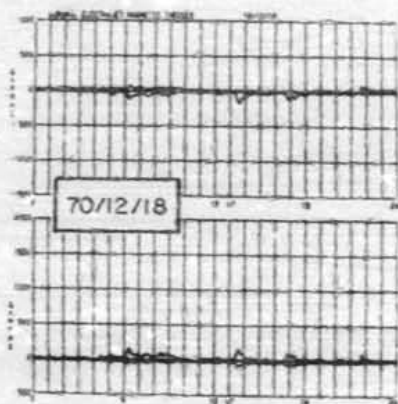
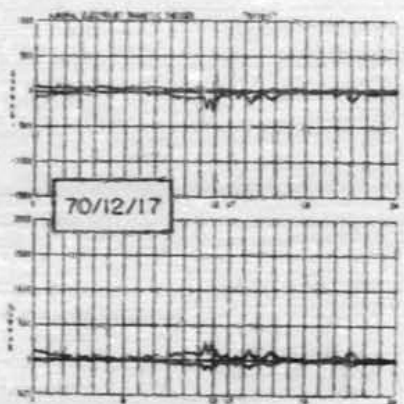
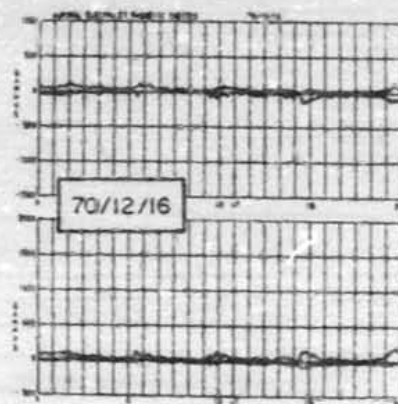
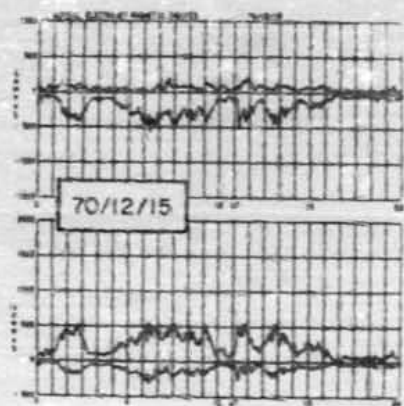


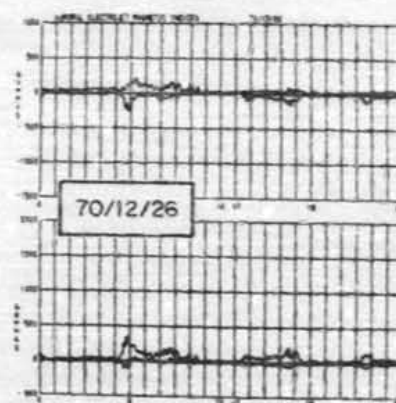
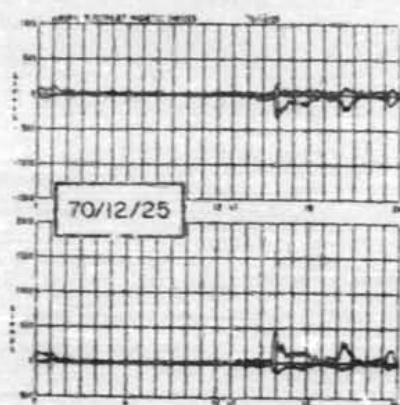
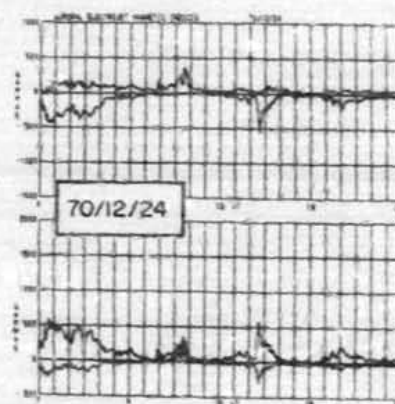
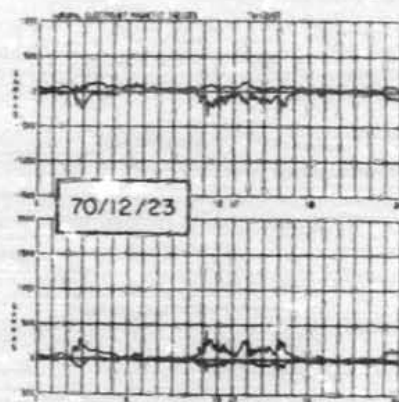
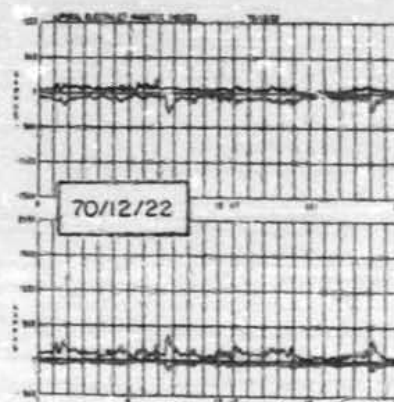
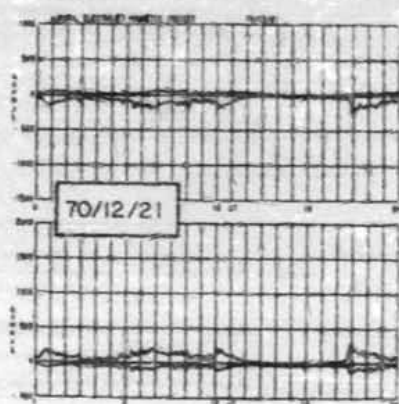


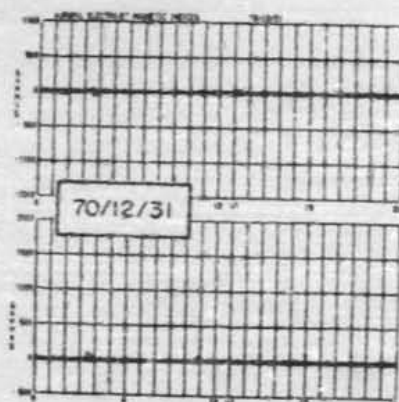
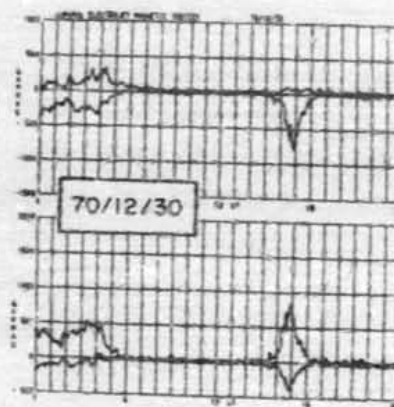
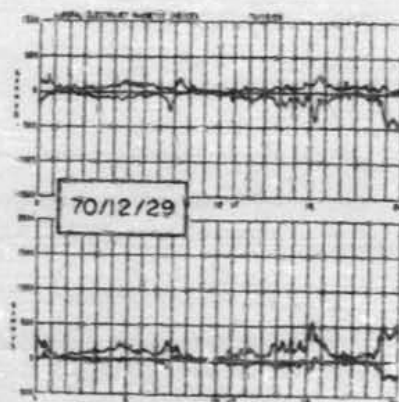
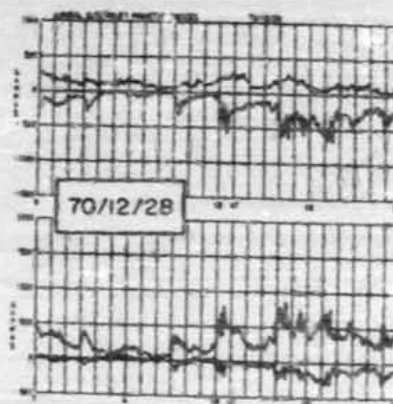
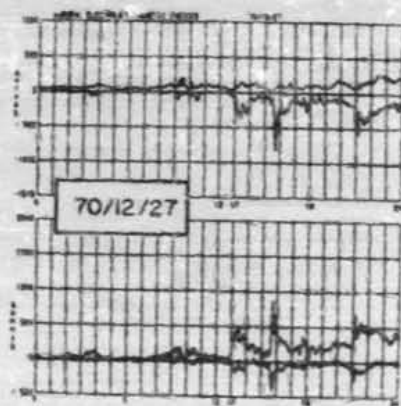












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29 51264	AE	28	34	33	34	39	14	10	8	14	12	19	21
19 61264	AE	35	46	38	40	38	15	21	28	7	19	31	31
29 61264	AE	33	47	53	56	38	56	75	70	117	51	28	38
19 71264	AE	51	56	54	39	24	17	12	11	20	20	51	131
29 71264	AE	232	53	35	159	299	345	150	55	58	250	534	119
19 81264	AE	135	145	112	38	51	213	78	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	39	31	28	19	33	73	47	62	69	137	106
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29141264	AE	106	115	98	81	32	226	66	92	202	262	152	73
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29151264	AE	55	32	26	27	18	14	31	55	26	21	36	74
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19191264	AE	115	108	72	34	40	10	10	56	66	141	86	79
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45	REC 5460, LENGTH	84
39	REC 5461, 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
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36	REC 5468, LENGTH	84
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18	REC 5477, LENGTH	84
22	REC 5478, LENGTH	84
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