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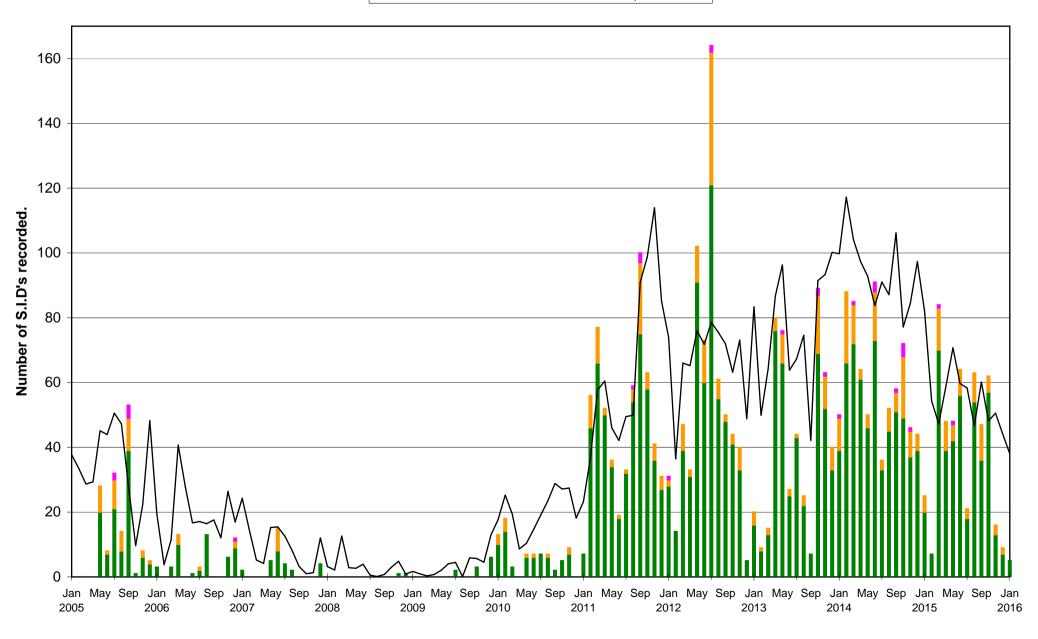
#### 2016 JANUARY

|         | SS           | ers     | John Co | ook (23.4 | 4kHz/22 <i>.1kl</i>        | Hz)  | Robe  | rto Batta | aiola (20.9kHz) | Paul  | Hyde (2 | 22.1/23.4kl               | Hz) | Mark Edv              | vards ( <b>2</b>      | <b>0.9</b> /24.0/18   | .3kHz)          | Colin Cl                                       | ements ( | 23.4kHz/22.1 | 1kHz) |  |
|---------|--------------|---------|---------|-----------|----------------------------|------|-------|-----------|-----------------|-------|---------|---------------------------|-----|-----------------------|-----------------------|-----------------------|-----------------|--|----------|--------------|-------|--|
|         | Xray class   | Observe |         |           | luency recei<br>ne aerial. | ver, | Mod   | ified AA  | VSO receiver.   |       |         | quency rec<br>ime aerial. |     | Spectrum              | n Lab / F             | PC 2m loop            | aerial.         | AAVSO receiver, 0.76m screened<br>loop aerial. |          |              |       |  |
| DAY     |              |         | START   | PEAK      | END (UT)                   |      | START | PEAK      | END (UT)        | START | PEAK    | END (UT                   | )   | START                 | PEAK                  | END (UT)              |                 | START  | PEAK     | END (UT)     |       |  |
| 6<br>15 | C1.8<br>C1.7 | 2<br>1  | 11:36   | 11:38     | 11:47                      | 1-   |       |           |                 |       |         |                           |     | <b>11:36</b><br>15:21 | <b>11:39</b><br>15:26 | <b>11:49</b><br>15:31 | <b>1-</b><br>1- |  |          |              |       |  |
| 27      | C1.0         | 3       |         |           |                            |      |       |           |                 | 13:29 | 13:31   | 13:58                     | 1+  | 13:29                 | 13:32                 | 13:36                 | 1-              | 13:19  | 13:28    | 13:30        | 1-    |  |
| 28      | C9.6         | 7       | 11:55   | 12:02     | 12:23                      | 1+   |       |           |                 | 11:55 | 12:03   | 12:33                     | 2   | 11:57                 | 12:03                 | 12:25                 | 1+              | 11:56  | 12:01    | 12:16        | 1     |  |
| 29      | C3.5         | 1       | 08:13   | 08:17     | 08:28                      | 1-   |       |           |                 |       |         |                           |     |                       |                       |                       |                 |  |          |              |       |  |

|                           |                                      | Stev  | e Parkins | son (Variou | us) | John   | Wardle       | (19.6/23.4kH | z)       | Ph       | il Rourk          | e (23.4kHz) |          | Jim B             | Barber  | John Elliott (18.3kHz) |       |          |    |  |  |
|---------------------------|--------------------------------------|---|-----------|-------------|-----|--------|--------------|--------------|----------|----------|-------------------|-------------|----------|-------------------|---|------------------------|-------|----------|----|--|--|
|                           |                                      | Tuned radio frequency receiver,<br>frame aerials. |           |             |     | PC sou | ).7m frame a | erial.       | Spectrur | m Lab, 0 | .6m frame aerial. | Spectrur    | m Lab, 0 | .6m frame aerial. | Tuned radio frequency receiver,<br>0.5m frame aerial. |                        |       |          |    |  |  |
| DAY                       |                                      | START   | PEAK      | END (UT)    |     | START  | PEAK         | END (UT)     |          | START    | PEAK              | END (UT)    | START    | PEAK              | END (UT)  | START                  | PEAK  | END (UT) |    |  |  |
| 6<br>15<br>27<br>28<br>29 | C1.8<br>C1.7<br>C1.0<br>C9.6<br>C3.5 | 11:56   | 12:02     | 12:21       | 1   | 11:56  | 12:03        | 12:20        | 1        |          |                   |             |          |                   |   | 12:00                  | 12:10 | 12:30    | 1+ |  |  |

# VLF flare activity 2005/16.

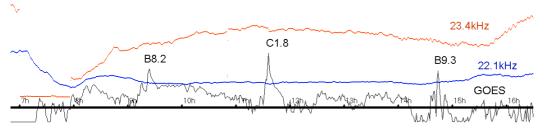
C M X — Relative sunspot number



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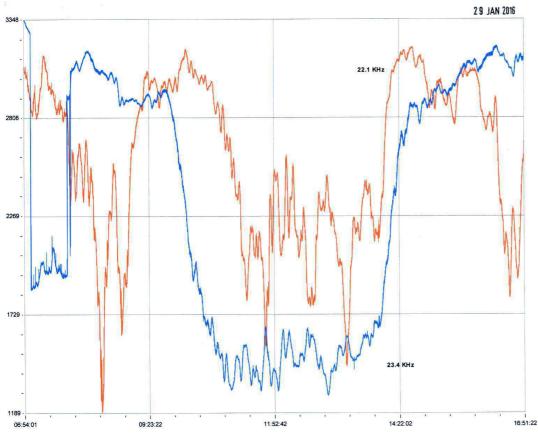
#### 2016 JANUARY.

The decline in solar activity at the end of 2015 has continued into the new year, with just five flares recorded as SIDs. None were of M- or X-class, although the GOES data does show a single M2.3 flare at 00:11UT on the 1<sup>st</sup>. From then until the 12<sup>th</sup> there were a total of just 23 flares, mostly of B-class. A single C1.8 flare was well timed near midday on the 6<sup>th</sup>, but general ionospheric instability made the SID very difficult to record.

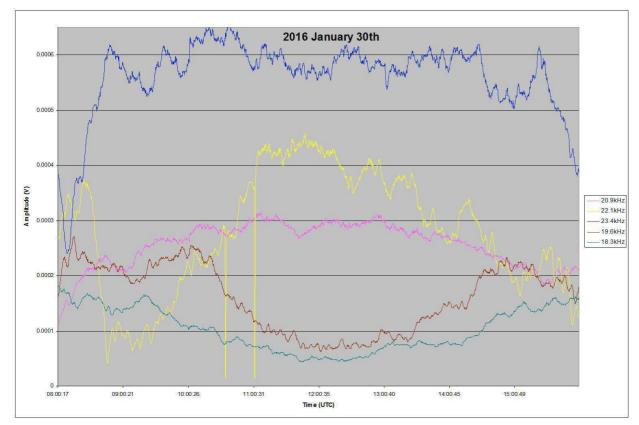


I have added the GOES X-ray flux to my own recording, above, to show just how insignificant this SID was.

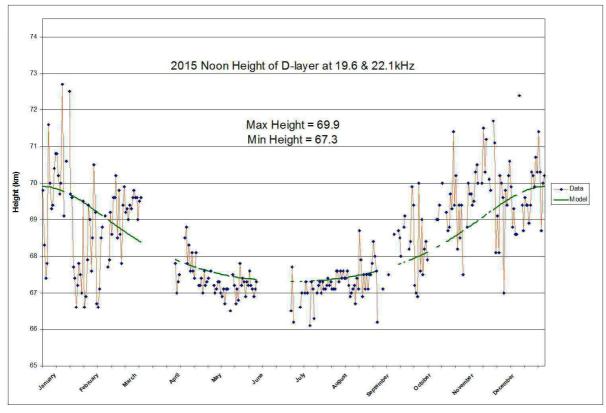
Noise from ionospheric instability has been a major feature through January. Colin Clements reported that it seemed to increase in magnitude through the month, an effect that I also noticed along with a general increase in signal level at 23.4kHz. On several occasions my receiver was saturated during the day, with much lower signal levels at night. Colin's recording from the 29<sup>th</sup> is shown below:



22.1kHz is in red, and shows some very strong disturbances from about 11 to 14:00UT. Mark Edwards also noted these oscillations on the 29<sup>th</sup>, and particularly on the 30<sup>th</sup> shown on the next page:



Much of the UK was battered by strong storms at the end of January, and some of this ionospheric instability may well be linked to these weather systems. Modelling the D-region height, Mark noted a significant rise from 69.4km on the 29<sup>th</sup> to 71.2km on the 30<sup>th</sup>. Mark has also produced his usual chart of D-region height in 2015, based on observations at 19.6kHz and 22.1kHz:

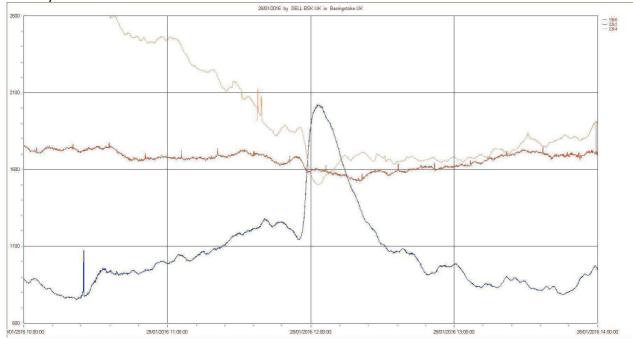


Red is the actual data, green is the model output. Note the large variations in actual height through the winter months compared to summer.

It is also interesting to see how the maximum and minimum heights have changed over the last five years:

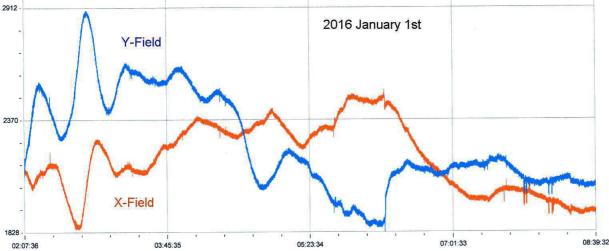
|      | Maximum | Minimum | Range |
|------|---------|---------|-------|
| 2011 | 71.6km  | 67.0km  | 4.6km |
| 2012 | 71.8km  | 66.8km  | 5.0km |
| 2013 | 71.4km  | 66.8km  | 4.6km |
| 2014 | 71.0km  | 67.2km  | 3.8km |
| 2015 | 69.9km  | 67.3km  | 2.6km |

The C9.6 flare on the 28<sup>th</sup> produced the best recorded SID of the month, well shown in the chart by Paul Hyde:



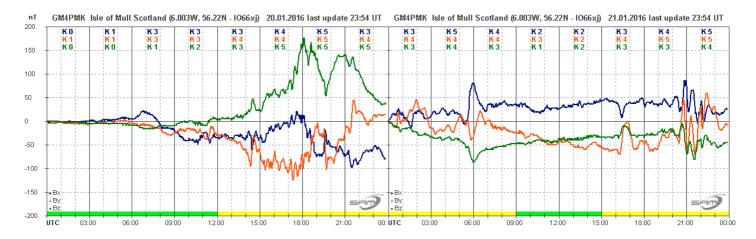
The blue trace (22.1kHz) shows a very strong SID, with a rather smaller SID at 23.4kHz (yellow). Strangely, it has hardly recorded any SID at 19.6kHz (red), despite the very similar path to that at 22.1kHz.

## MAGNETIC OBSERVATIONS.



In the December summary I noted a strong magnetic disturbance on December 31<sup>st</sup>. This continued on January 1<sup>st</sup>, lasting until about 10:00UT. Colin Clements recorded a part of this activity:

The only strong CME in January originated with a filament eruption in the solar southern hemisphere on the 14<sup>th</sup>. ACE satellite data shows a magnetic shock at 20:56 on the 18<sup>th</sup>, but I have no SSC recorded for this event. There followed a very mild magnetic disturbance on the 19<sup>th</sup>, but its real effect was not seen until the 20<sup>th</sup> and 21<sup>st</sup>. CHHSS effects added to the CME in the afternoon of the 21<sup>st</sup>, increasing the strength of the disturbance. I have combined two of Roger Blackwell's charts to show the activity. Note that the magnetometer is reset at local midnight, producing a discontinuity.



There was a very mild disturbance overnight on the 6<sup>th</sup>/7<sup>th</sup> of January, measuring about 28nT on my single-axis magnetometer. This was from a recurrent coronal hole high speed stream. CHHSS effects were also responsible for a longer period of disturbance from the 10<sup>th</sup> to 13<sup>th</sup>, measuring about 50nT maximum.

Magnetic observations received from Colin Clements, Roger Blackwell, Gonzalo Vargas and John Cook.

BAA Radio Astronomy Group

BARTELS DIAGRAM

| DAA I    | Radio Astro           | noniy (     | noup               |                 |                    |                    | _                   |                    |                      |                    |                    | BAKT                 | els dia             | AGKAM             |              |             |                    |                     |                       |                         |                      |                      |                  |                     |              |                      |            |
|----------|-----------------------|-------------|--------------------|-----------------|--------------------|--------------------|---------------------|--------------------|----------------------|--------------------|--------------------|----------------------|---------------------|-------------------|--------------|-------------|--------------------|---------------------|-----------------------|-------------------------|----------------------|----------------------|------------------|---------------------|--------------|----------------------|------------|
| ROTATION | KEY:                  | 2138        | DISTU              | RBED.           |                    |                    | ACTIVE              |                    |                      | SFE                |                    |                      | B, C, M,            | X = FLA           | RE MAG       | NITUDE      | i.                 | Sj                  | nodic ro/<br>(carrin) | otation sta<br>gton's). | art                  | 2013 Ju              | h                |                     |              |                      |            |
| 2454     | 10<br>F BC            | 2130        | 12                 | 13              | 14                 | 15                 | 16                  | 17                 | 18                   | 19<br>CC           | 20<br>CCC          | 21<br>CC             | 22<br>C             | 23<br>M           | 24<br>CCCC   | 25<br>B     | 26<br>C            | 27<br>CBC           | 28<br>C               | 29                      | 30<br>CCCC           | 2013-30<br>1<br>CC   | 2<br>CC          | 3<br>MCCC           | 4<br>CCCC    | 5<br>CCCC<br>2013 Au | 6          |
| 2455     | 7<br>F CB             | 8           | 9<br>C             | 10<br>C         | 11<br>CC           | 12<br>C            | 13<br>C             | 14<br>C            | 15<br>CC             | 16<br>C            | 17<br>C            | 18<br>CC             | 19                  | 20                | 21<br>CC     | 22          | 23                 | 24                  | 25                    | 26                      | 27<br>C              | 28<br>CCCC           | 29<br>C          | 30                  | 31           | 1                    | 2          |
| 2456     | 3<br>F                | 2140<br>4   | 5                  | 6               | 7                  | 8                  | 9                   | 10                 | 11<br>CCC            | 12<br>M            | 13<br>CCCC         | 14<br>CCC            | 15<br>CC            | 16<br>CC          | 17<br>CMM    | 18<br>C     | 19<br>C            | 20<br>C             | 21<br>CC              | 22<br>C                 | 23                   | 24                   | 25               | 26                  | 27           | 28                   | 29         |
| 2457     | 30<br>F               | 31<br>C     | 2013 Se<br>1<br>C  | ptembe<br>2     | r<br>3<br>BC       | 4<br>C             | 5                   | 6                  | 7                    | 8                  | 9                  | 10                   | 11                  | 12                | 13           | 14          | 15                 | 16                  | 17                    | 18                      | 19                   | 20<br>CCCC           | 21               | 22                  | 23           | 24                   | 25         |
| 2458     | 26<br>F               | 27          | 2142<br>28         | 29              | 30                 | 2013 O<br>1        | ctober<br>2         | 3                  | 4                    | 5                  | 6<br>C             | 7<br>C               | 8                   | 9<br>C            | 10<br>CCCC   | 11<br>MCCC  | 12<br>CCC          | 13<br>C             | 14<br>C               | 15<br>CMCC              | 16<br>CCC            | 17<br>CCM            | 18<br>CCCC       | 19<br>CCC           | 20<br>CC     | 21                   | 22<br>CCCM |
| 2459     | 23<br>F CCCC          | 24<br>CMMC  | 2143<br>25<br>XMXM | 26<br>MMMM      | 27<br>CCMC         | 28<br>MMMM         | 29<br>CCCC          | 30<br>C            | 31<br>MCC            | 2013 N<br>1<br>C   | ovembe<br>2<br>CCC | r<br>3<br>C          | 4<br>CCC            | 5<br>MCCM         | 6<br>CCCM    | 7<br>CCMC   | 8<br>M             | 9<br>CC             | 10<br>CCC             | 11<br>CMC               | 12<br>CC             | 13<br>CCCM           | 14<br>CCC        | 15<br>C             | 16<br>MCC    | 17<br>CCC            | 18<br>CCC  |
| 2460     | 19<br>F X             | 20<br>CC    | 2144<br>21<br>M    | 22<br>C         | 23<br>CCM          | 24<br>CC           | 25                  | 26                 | 27                   | 28                 | 29                 | 30                   | 2013 D<br>1<br>C    | ecember<br>2<br>C | 3            | 4           | 5<br>C             | 6<br>C              | 7                     | 8<br>C                  | 9<br>CCC             | 10                   | 11<br>CC         | 12<br>C             | 13           | 14<br>CC             | 15<br>CC   |
| 2461     | 16<br>F C             | 17          | 18                 | 2145<br>19<br>C | 20<br>CMCC         | 21<br>C            | 22<br>MMMM          | 23<br>M            | 24                   | 25<br>C            | 26                 | 27<br>CC             | 28<br>CC            | 29<br>MCCC        | 30<br>C      | 31<br>C     | 2014 Ja<br>1<br>C  | nuary<br>2<br>C     | 3<br>CCMC             | 4<br>CCMC               | 5<br>C               | 6<br>C               | 7<br>CMCX        | 8<br>CCCC           | 9            | 10                   | 11<br>CCC  |
| 2462     | 12<br>F               | 13<br>CC    | 14<br>C            | 2146<br>15      | 16<br>C            | 17<br>CCCC         | 18<br>CC            | 19                 | 20                   | 21                 | 22                 | 23                   | 24                  | 25                | 26<br>C      | 27<br>C     | 28<br>MMMM         | 29<br>CCC           | 30<br>MCC             | 31<br>CM                | 2014 Fe<br>1<br>CCCC | ebruary<br>2<br>MMMM | 3<br>CCCC        | 4<br>MCCM           | 5<br>CCCM    | 6<br>CCC             | 7<br>CCMC  |
| 2463     | 8<br>F CCC            | 9<br>M      | 10<br>CC           | 11<br>CM        | 2147<br>12<br>CM   | 13<br>MCCM         | 14<br>CMMM          | 15                 | 16<br>MCC            | 17<br>CCC          | 18<br>CC           | 19<br>C              | 20<br>M             | 21<br>CC          | 22<br>C      | 23<br>CC    | 24<br>MMC          | 25<br>C             | 26<br>CCM             | 27<br>CCCC              | 28<br>CCC            | 2014 Ma<br>1<br>MC   | arch<br>2<br>CCC | 3<br>CCCM           | 4<br>CCCC    | 5<br>C               | 6          |
| 2464     | 7<br>F                | 8           | 9<br>CCMM          | 10<br>CCCM      | 2148<br>11<br>CMCC | 12                 | 13<br>CCM           | 14<br>C            | 15<br>CCC            | 16<br>CC           | 17<br>CCC          | 18<br>C              | 19<br>CCCC          | 20<br>CC          | 21<br>C      | 22<br>MCC   | 23<br>CC           | 24<br>CC            | 25                    | 26<br>CC                | 27                   | 28<br>CM             | 29<br>CCCX       | 30<br>M             | 31<br>MC     | 2014 Ap<br>1         | 2<br>CCM   |
| 2465     | 3<br>F CC             | 4<br>CCC    | 5<br>CCC           | 6               | 2149<br>7<br>CC    | 8                  | 9                   | 10<br>C            | 11<br>CCC            | 12<br>C            | 13<br>C            | 14<br>CCCC           | 15<br>CCCC          | 16<br>CCCM        | 17<br>CC     | 18<br>CM    | 19<br>CCCC         | 20<br>CCCC          | 21<br>C               | 22<br>CCCC              | 23<br>CCCC           | 24<br>C              | 25<br>CC         | 26<br>C             | 27           | 28<br>BC             | 29<br>B    |
| 2466     | 30<br>F B             | 2014 M<br>1 | 2                  | 3<br>CCCC       | 4<br>CCCC          | 2150<br>5<br>C     | 6<br>MCC            | 7<br>CMC           | 8<br>M               | 9<br>CCCC          | 10<br>CCC          | 11<br>CCCC           | 12                  | 13<br>C           | 14<br>CCC    | 15<br>C     | 16<br>CCC          | 17                  | 18                    | 19                      | 20<br>B              | 21<br>C              | 22<br>C          | 23                  | 24<br>M      | 25<br>C              | 26<br>CCC  |
| 2467     | 27<br>F C             | 28          | 29                 | 30              | 31<br>B            | 2014 Ju<br>1<br>C  | 2<br>M              | 3<br>CCM           | 4                    | 5                  | 6                  | 7<br>CC              | 8<br>CC             | 9<br>CCC          | 10<br>CCXX   | 11<br>MMXC  | 12<br>MMMM         | 13<br>MCCC          | 14<br>CCM             | 15<br>CMCC              | 16<br>CCCC           | 17<br>CBCC           | 18<br>CC         | 19<br>C             | 20<br>CC     | 21<br>C              | 22<br>B    |
| 2468     | 23<br>F               | 24<br>BBB   | 25                 | 26              | 27                 | 2152<br>28<br>CCCC | 29                  | 30<br>CC           | 2014 Ju<br>1<br>CCCM | ly<br>2<br>C       | 3                  | 4<br>C               | 5                   | 6<br>CC           | 7<br>CC      | 8<br>CM     | 9<br>C             | 10<br>CC            | 11                    | 12<br>CCC               | 13<br>CCCC           | 14                   | 15               | 16                  | 17           | 18                   | 19         |
| 2469     | 20<br>F               | 21<br>B     | 22                 | 23              | 24                 | 2153<br>25<br>C    |                     | 27<br>CC           | 28                   | 29<br>CC           | 30<br>CC           | 31<br>CMCC           | 2014 Au<br>1<br>CMM |                   | 3<br>C       | 4           | 5<br>CCC           | 6                   | 7                     | 8<br>CCCC               | 9<br>C               | 10                   | 11               | 12                  | 13           | 14                   | 15<br>CC   |
| 2470     | 16<br>F C             | 17          | 18<br>C            | 19              | 20<br>CCCC         | 21<br>CMCC         | 2154<br>22<br>MCCC  | 23<br>CCCC         | 24<br>CMC            | 25<br>MM           | 26<br>C            | 27                   | 28<br>CB            | 29<br>C           | 30<br>CCB    | 31<br>CCCC  | 2014 Se<br>1<br>CC | eptember<br>2<br>CC | 3<br>CCM              | 4<br>CCCC               | 5<br>CC              | 6<br>CCMC            | 7<br>CCC         | 8<br>C              | 9<br>C       | 10<br>CCX            | 11<br>CCM  |
| 2471     | 12<br>F CCCC          | 13<br>CC    | 14                 | 15              | 16<br>CC           | 17                 | 2155<br>18<br>CMC   | 19<br>C            | 20<br>CC             | 21<br>CCC          | 22                 | 23                   | 24<br>CC            | 25<br>C           | 26<br>CCC    | 27<br>M     | 28<br>CCMM         | 29<br>C             | 30                    | 2014 Oc<br>1            | tober<br>2<br>MM     | 3<br>CCC             | 4                | 5                   | 6            | 7                    | 8<br>C     |
| 2472     | 9<br>F MCCC           | 10          | 11                 | 12              | 13                 | 14                 | 2156<br>15          | 16<br>CCM          | 17<br>CC             | 18<br>MCCC         | 19<br>CCCC         | 20<br>MCMM           | 21<br>CCCM          | 22<br>CCXM        | 23<br>MCC    | 24<br>MCC   | 25<br>CCCX         | 26<br>XCCM          | 27<br>CCMX            | 28<br>CCM               | 29<br>MMMM           | 30<br>CCCC           | 31               | 2014 N<br>1<br>CCCC | ovember<br>2 | 3<br>M               | 4<br>MM    |
| 2473     | 5<br>F MC             | 6<br>C      | 7<br>MCCX          | 8               | 9<br>CCM           | 10<br>CC           | 2157<br>11<br>C     | 12<br>C            | 13<br>C              | 14<br>CC           | 15<br>M            | 16<br>CCCM           | 17<br>C             | 18                | 19           | 20          | 21                 | 22<br>C             | 23<br>C               | 24<br>C                 | 25                   | 26                   | 27<br>CCC        | 28<br>C             | 29<br>CCCC   | 30<br>CC             | 1          |
| 2474     | 2014 De<br>2<br>F CCC | 3<br>CCCC   | 4<br>MCM           | 5<br>CCM        | 6<br>C             | 7                  | 8                   | 2158<br>9<br>CCCCC | 10                   | 11<br>C            | 12<br>C            | 13<br>CCC            | 14<br>CC            | 15                | 16<br>CCC    | 17<br>CC    | 18<br>CCC          | 19<br>MC            | 20<br>C               | 21<br>M                 | 22<br>C              | 23                   | 24               | 25<br>C             | 26<br>C      | 27                   | 28<br>C    |
| 2475     | 29<br>F C             | 30          | 31<br>C            | 2015 Ja<br>1    | anuary<br>2        | 3<br>M             | <b>4</b><br>M       | 2159<br>5<br>C     | 6<br>C               | 7<br>CC            | 8<br>C             | 9<br>C               | 10<br>C             | 11                | 12<br>CC     | 13<br>C     | 14<br>CM           | 15<br>CC            | 16                    | 17                      | 18                   | 19                   | 20               | 21<br>CCC           | 22           | 23<br>CC             | 24         |
| 2476     | 25<br>F               | 26          | 27<br>CC           | 28<br>C         | 29<br>MC           | 30<br>M            | 31                  | 2015 Fe<br>1<br>C  | bruary<br>2          | 3<br>CC            | 4<br>C             | 5                    | 6                   | 7                 | 8            | 9           | 10                 | 11                  | 12                    | 13                      | 14                   | 15                   | 16               | 17                  | 18           | 19                   | 20<br>C    |
| 2477     | 21<br>F               | 22          | 23                 | 24              | 25                 | 26                 | 27                  | 28<br>CC           | 2015 Ma<br>1<br>C    | arch<br>2<br>CMCCN | 3<br>1 CC          | 4<br>CC              | 5<br>CM             | 6<br>MCCC         | 7            | 8<br>C      | 9<br>CCMC          | 10<br>CCCC          | 11<br>MMCX            | 12<br>CMMM              | 13<br>C              | 14<br>CCCC           | 15<br>MCCC       | 16<br>CCMC          | 17           | 18<br>CCCC           | 19<br>C    |
| 2478     | 20<br>F               | 21          | 22                 | 23<br>C         | 24                 | 25<br>CC           | 26<br>CC            | 27<br>CCC          | 2162<br>28<br>CC     | 29<br>CCCC         | 30<br>CC           | 31                   | 2015 Aj<br>1        | pril<br>2         | 3            | 4           | 5                  | 6                   | 7                     | 8<br>M                  | 9<br>CCCC            | 10<br>CCCC           | 11<br>C          | 12<br>CMCC          | 13<br>CCC    | 14                   | 15<br>C    |
| 2479     | F CCCC                | 17<br>C     | 18<br>CCC          | 19              | 20                 | 21<br>MMMM         | 22<br>CCMC          | 23<br>CMCC         | 2163<br>24<br>C      | 25<br>C            | 26<br>C            | 27                   | 28                  | 29                | 30           | 2015 M<br>1 | ay<br>2            | 3<br>C              | 4<br>CCC              | 5<br>MMMX               | 6<br>CCMC            | 7<br>CCCC            | 8<br>CC          | 9<br>CC             | 10<br>CCC    | 11                   | 12<br>CC   |
| 2480     | 13<br>F CCCC          | 14<br>CCCC  | 15                 | 16              | 17<br>B            | 18                 | 19<br>C             | 20<br>C            | 21                   | 2164<br>22         | 23<br>CC           | 24                   | 25                  | 26                | 27           | 28          | 29                 | 30                  | 31                    | 2015Jur<br>1            | e<br>2<br>C          | 3                    | 4<br>CC          | 5<br>CC             | 6            | 7<br>CC              | 8          |
| 2481     | 9<br>F                | 10<br>CCC   | 11<br>CMCC         | 12<br>CC        | 13<br>MCCC         | 14<br>C            | 15<br>CC            | 16<br>CC           | 17<br>CC             | 2165<br>18<br>CCM  |                    | 20<br>MC             | 21<br>MCCM          | 22<br>CCCM        | 23<br>C      | 24<br>C     | 25<br>M            | 26                  | 27                    | 28<br>C                 | 29<br>CCCC           | 30<br>C              | 2015 Ju<br>1     |                     | 3<br>CCCM    | 4                    | 5          |
| 2482     | F MCCM                | 7<br>C      | 8                  | 9               | 10<br>C            | 11                 | 12                  | 13                 | 14<br>C              | 2166<br>15         |                    | 17                   | 18<br>C             | 19                | 20           | 21          | 22                 | 23                  | 24<br>CC              | 25                      | 26<br>C              | 27                   | 28               | 29                  | 30           | 31                   | 1<br>C     |
| 2483     | 2015 Au<br>2<br>F     |             | 4                  | 5               | 6<br>C             | 7<br>CBCC          | 8<br>CC             | 9<br>C             | 10                   | 11                 | 2167<br>12         | ,<br>13              | 14                  | 15<br>C           | 16           | 17          | 18                 | 19                  | 20<br>CC              | 21<br>MCM               | 22                   | 23<br>CCCC           | 24<br>MCCM       | 25<br>CCCC          | 26<br>CC     | 27<br>M              | 28<br>CMCM |
| 2484     | 29<br>F CCC           | 30<br>CC    | 31                 | 2015 Se<br>1    | eptembe<br>2       |                    | 4                   | 5                  | 6                    | 2168<br>7          | 8                  | 9                    | 10                  | 11                | 12           | 13          | 14                 | 15                  | 16<br>CC              | 17<br>CMCC              | 18<br>C              | 19<br>C              | 20<br>CCM        | 21                  | 22           | 23<br>CCC            | 24         |
| 2485     | 25<br>F               | 26<br>C     | 27<br>CMCC         | 28<br>MCMM      | 29<br>MMCM         | 30                 | 2015 Oc<br>1<br>CCM | tober<br>2<br>CCMM | 3<br>CCCC            | 2169<br>4          | 5                  | 6                    | 7                   | 8                 | 9            | 10          | 11                 | 12                  | 13<br>CC              | 14<br>CC                | 15                   | 16<br>MCCC           | 17               | 18                  | 19<br>CCC    | 20<br>C              | 21<br>CCC  |
| 2486     | 22<br>F               | 23          | 24                 | 25              | 26<br>C            | 27                 | 28<br>C             | 29<br>CC           | 30<br>CCCC           | 31<br>CCCM         | 1                  | ovember<br>2<br>CCCC | 3                   | 4<br>CMM          | 5            | 6           | 7                  | 8                   | 9<br>M                | 10<br>CC                | 11                   | 12                   | 13               | 14                  | 15           | 16                   | 17         |
| 2487     | -<br>18<br>F          | 19          | 20                 | 21<br>C         | 22                 | 23                 | 24                  | 25                 | 26                   | 27                 | 2171<br>28         |                      | 30                  |                   | ecember<br>2 | 3           | 4                  | 5<br>C              | 6                     | 7                       | 8                    | 9                    | 10<br>C          | 11                  | 12<br>CC     | 13                   | 14         |
| 2488     | 15<br>F               | 16          | 17                 | 18              | 19                 | 20                 | 21<br>M             | 22<br>C            | 23                   | 24                 | 2172<br>25         | 26                   | 27                  | 28<br>M           | 29<br>C      | 30          | 31                 | 2016 Ja<br>1        | nuary<br>2            | 3                       | 4                    | 5                    | 6<br>C           | 7                   | 8            | 9                    | 10         |
| 2489     | 11<br>F               | 12          | 13                 | 14              | 15<br>C            | 16                 | 17                  | 18                 | 19                   | 20                 | 21                 | 2173<br>22           | 23                  | 24                | 25           | 26          | 27<br>C            | 28<br>C             | 29<br>C               | 30                      | 31                   | 2016 Fe<br>1         |                  | 3                   | 4            | 5                    | 6          |
|          | r                     |             |                    |                 | U                  |                    |                     |                    |                      |                    |                    | 1                    |                     |                   |              |             | U                  | U                   | U                     |                         |                      |                      |                  |                     |              |                      |            |