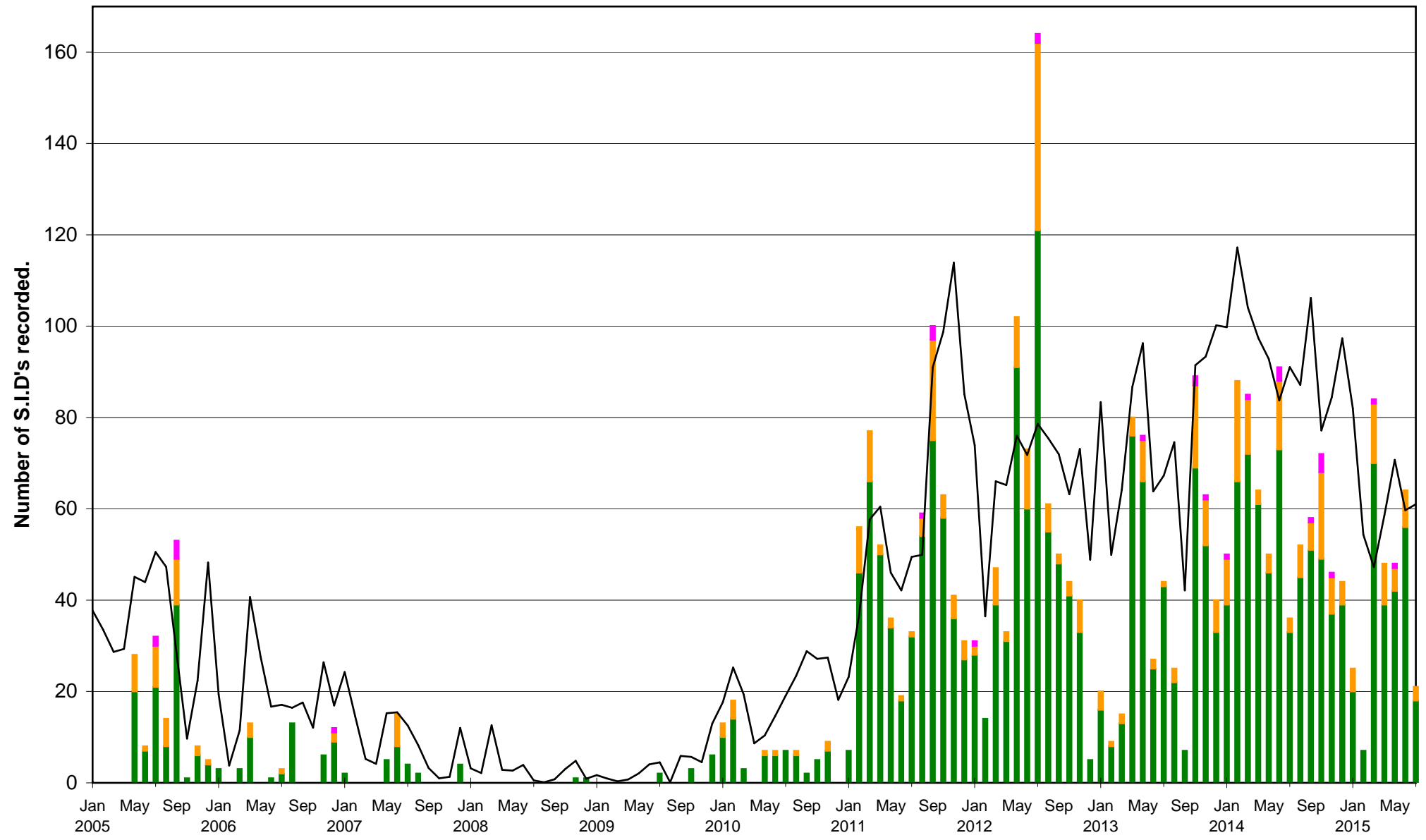
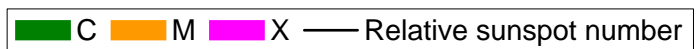
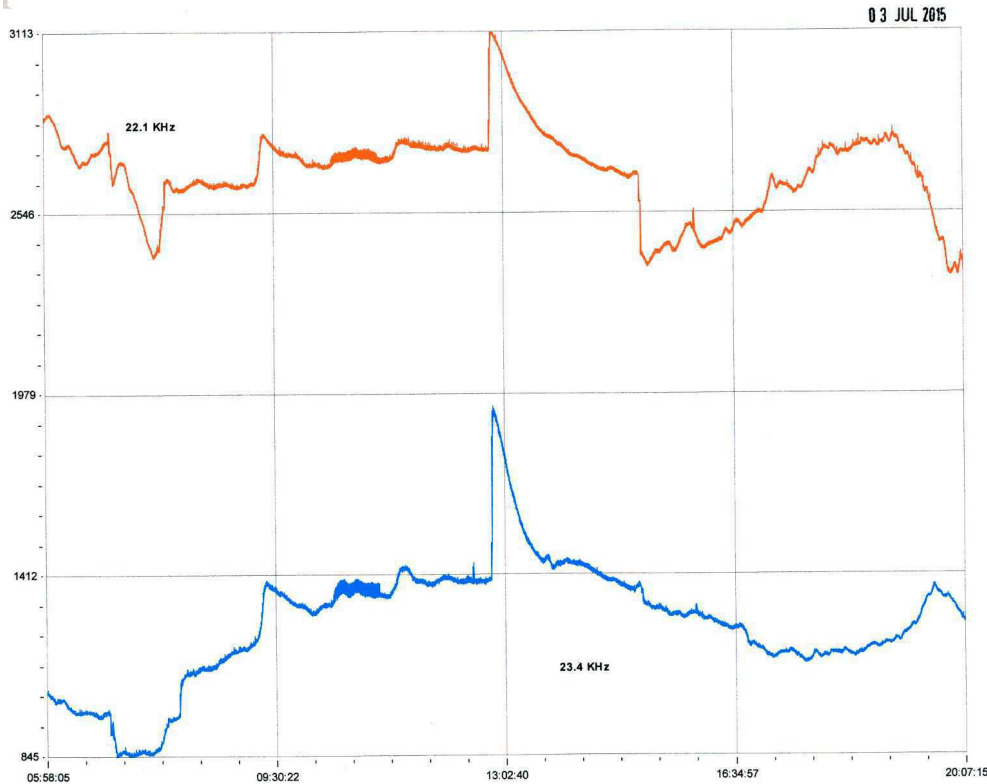


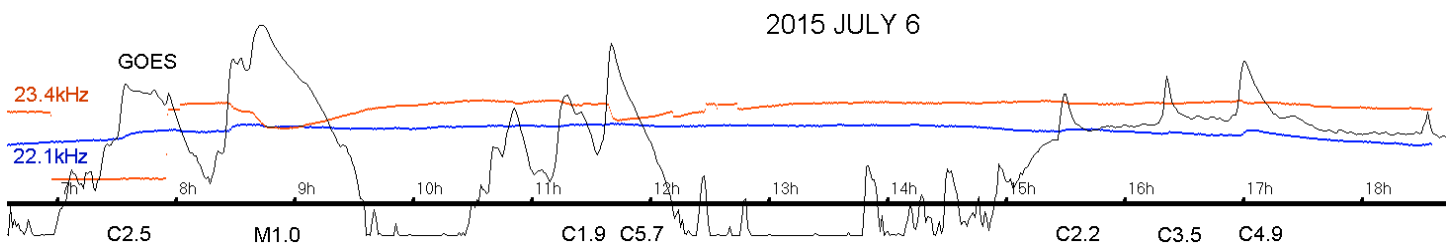
VLF flare activity 2005/15.



Activity in July was significantly lower than in recent months with a total of just 21 flares recorded as SIDs. No X-class flares were recorded in the GOES X-ray data, the most energetic event being the M1.7 late on the 6th.



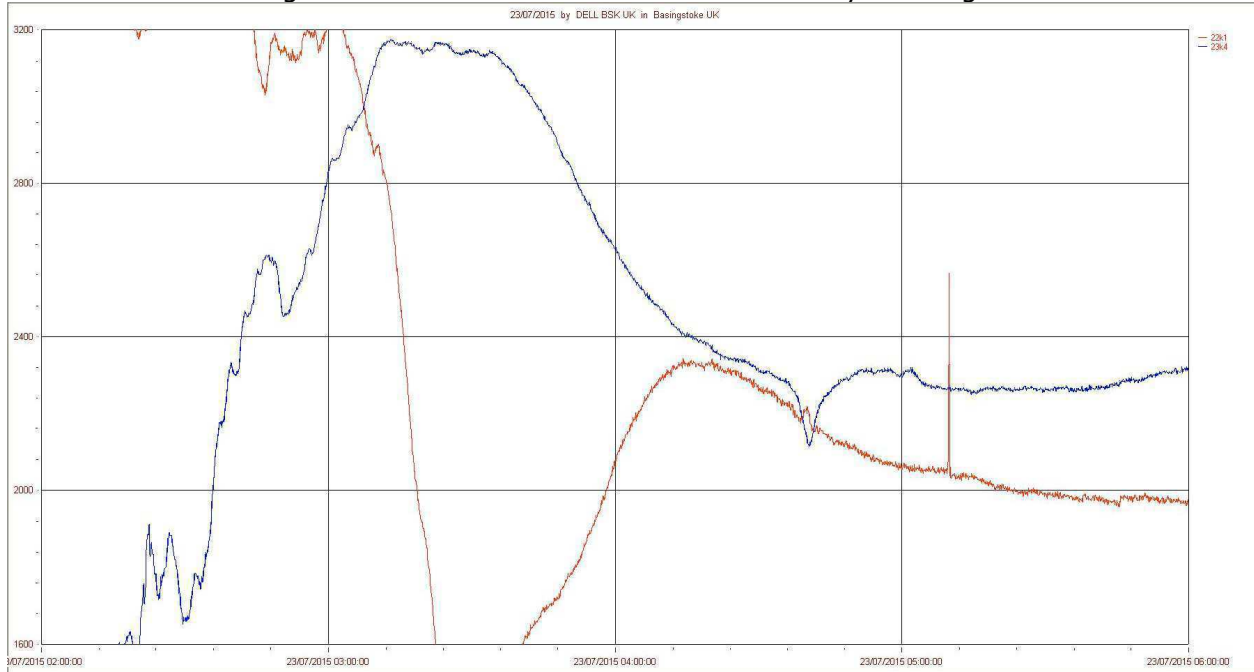
This chart by Colin Clements shows activity on the 3rd. The M1.5 flare has created a classic ‘shark’s fin’ SID at 12:52UT. The C3.4 flare at 09:20 has also left a well defined SID.



The busiest day of the month was the 6th, with 45% of the recorded SIDs. My own recording (above) shows some of this activity with the GOES X-ray flux added. AR12381 seems to have been responsible for all of these flares. A fairly large and complex group, it was about half way from the east limb to the central meridian on the 6th. The C2.5 flare was rather flat-peaked, but resulted in just a single SID. The M1.0 flare has a small sub-peak before the main peak that produced a separate SID for some observers. The last three flares in this recording are rather strange in that they are superimposed on a much longer flare-like rise in X-ray flux that lasted until about 22:00UT. Its peak level was about C1.0, although its source is not clear from SWPC data. The M1.7 flare at 20:43 was rather late in the evening for European signals, but was recorded at 24kHz on the trans-Atlantic path.

AR12381 was on the meridian by the 9th, but appears to have split into two separate groups with much less activity. The background X-ray flux dropped to B2/B3 levels, remaining there for the rest of the month with just the odd small flare recorded.

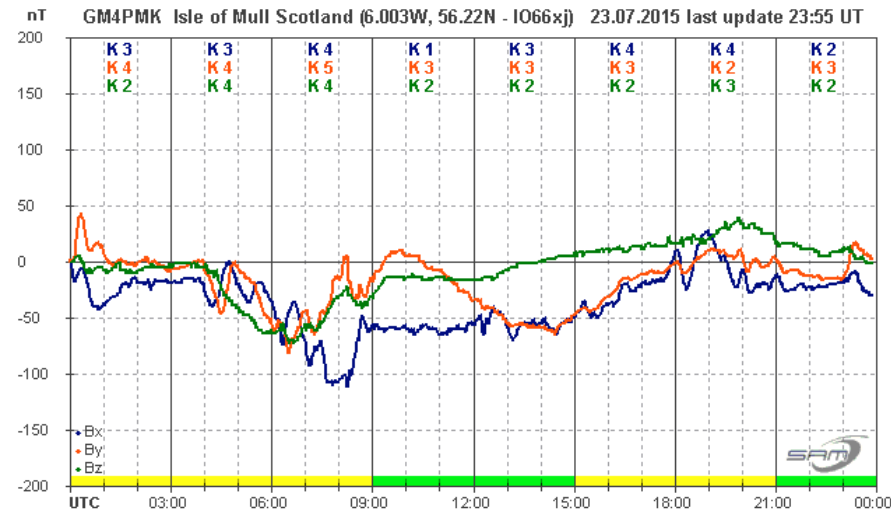
A rather strange SID-like feature was recorded in the early morning of the 23rd:



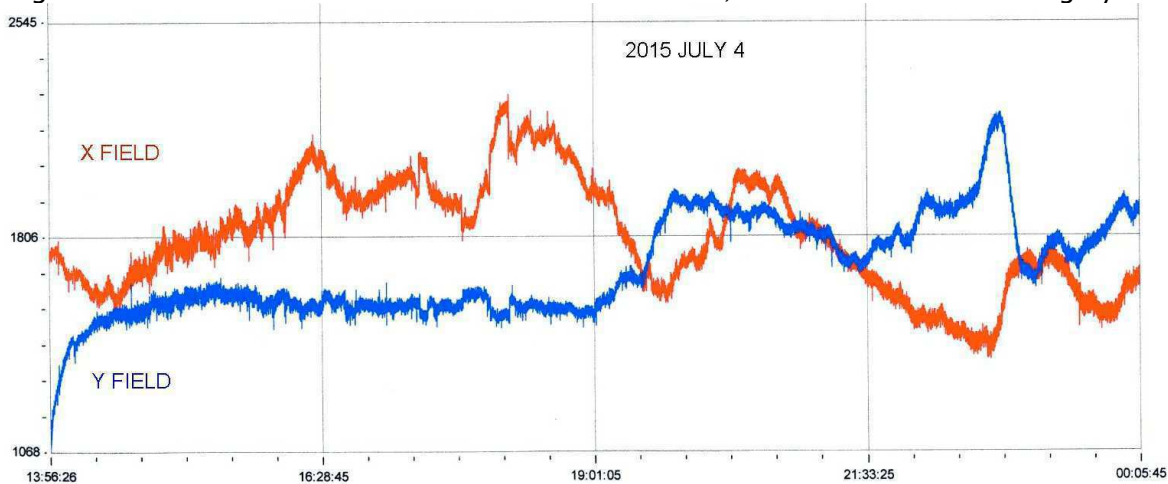
Paul Hyde's recording (above) shows 22.1kHz in red and 23.4kHz in blue. A large symmetrical dip can be seen at 04:40UT in the 23.4kHz signal, with a smaller matching signal rise at 22.1kHz. My own recording shows a very similar response, timed at 04:39. X-ray flux was at its lowest level, at B1.7 in the GOES data. A similar response can be seen in the online recordings of Lionel Loudet in southern France (www.sidstation.loudet.org/data-en.xhtml) timed at 05:20UT. This could be a sunrise effect, as local sunrise in southern France would be later in the morning compared with here in the UK.

MAGNETIC OBSERVATIONS.

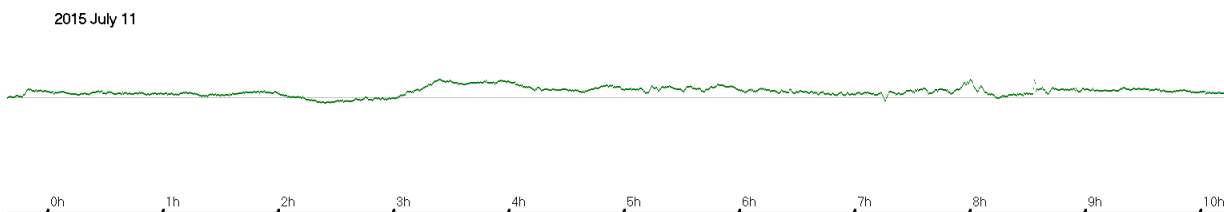
With the low level of activity there were no Earth-directed flare-derived CMEs recorded. The only significant CME was from a filament eruption at 10:40 on the 19th. This resulted in a gentle magnetic disturbance on the 23rd, as shown in the recording by Roger Blackwell:



Coronal hole effects were responsible for all of the remaining disturbances shown on the Bartels diagram. The first of these started at 19:00UT on the 4th, as shown in the recording by Colin Clements:

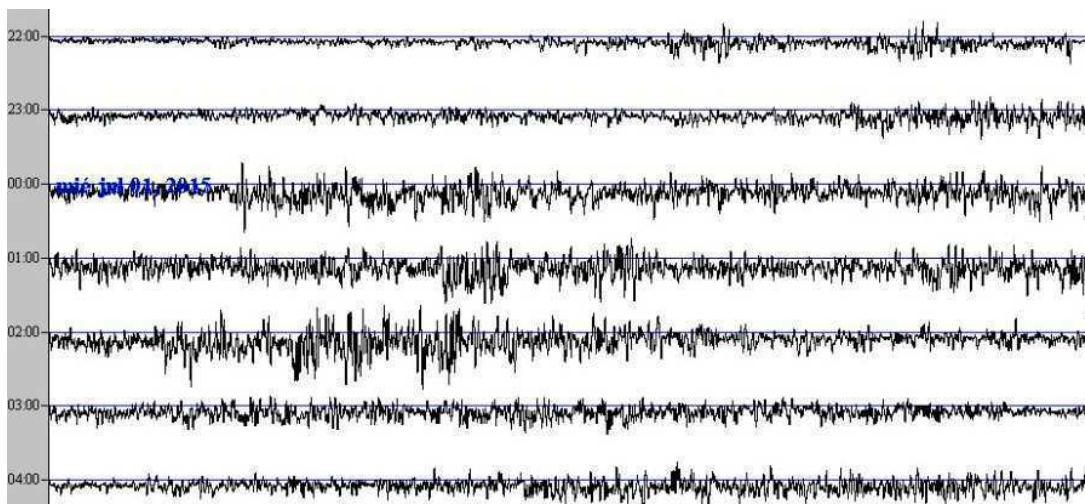


This disturbance continued until about 05UT on the 5th.



This chart shows further CHSS effects on the 11th. Although fairly small in amplitude, the variations become quite rapid between 05 and 08UT. More gentle disturbances continued on the 12th, 13th and 14th.

The British Geological Survey monthly bulletin reports a small SFE associated with the M1.5 flare on the 3rd. My own magnetic recording suffers from some local interference around this time, and does not show any evidence of a disturbance.



This chart shows the activity recorded on June 30th/July 1st by Gonzalo Vargas in Bolivia. Briefly mentioned in last month's summary, the source of this disturbance is unknown, and it seems to have been confined to American longitudes. Each line of the chart spans just one hour, with 00:00 on July 1st starting on the third line down. The vertical scale is uncalibrated.

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

BARTELS DIAGRAM

ROTATION	KEY:	DISTURBED.	ACTIVE	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).
2440	F	28 BB	29 C	30 CCCC	31 C	2012 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
		24	25 C	26 CCCC	27 CMC	2012 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
2441	F	21	22 CB	23 CCCC	24 C	2012 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		17	18 CMC	19 MCC	20 C	2012 September 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2443	F	13	14 C	15 C	16 C	2012 October 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		10	11 CMC	12 C	13 CB	2012 November 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2444	F	6	7 C	8 C	9 C	2012 December 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		2131	2132	2133	2134	2013 January 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2447	F	3	4 C	5 C	6 C	2013 February 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		2135	2136	2137	2138	2013 March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2451	F	21	22 C	23 CBC	24 C	2013 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		17	18 C	19 C	20 C	2013 May 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2452	F	14	15 C	16 C	17 C	2013 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		10	11 BC	12 C	13 C	2013 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2454	F	7	8 CB	9 C	10 C	2013 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		3	4 C	5 C	6 C	2013 September 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2455	F	30	31 C	1 BC	2 C	2013 October 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		26	27 C	28 C	29 C	2013 November 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2457	F	23	24 C	25 C	26 C	2013 December 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		19	20 X	21 C	22 C	2014 January 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2460	F	16	17 C	18 C	19 C	2014 February 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		12	13 C	14 C	15 C	2014 March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2463	F	8	9 C	10 C	11 C	2014 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		7	8 C	9 C	10 C	2014 May 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2464	F	3	4 C	5 C	6 C	2014 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		30	31 B	1 C	2 C	2014 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2466	F	27	28 C	29 C	30 C	2014 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		23	24 BBB	25 C	26 C	2014 September 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2468	F	20	21 B	22 C	23 C	2014 October 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		16	17 C	18 C	19 C	2014 November 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2470	F	12	13 C	14 C	15 C	2014 December 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		5	6 MC	7 C	8 C	2015 January 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2472	F	9	10 C	11 C	12 C	2015 February 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		29	30 C	31 C	1 C	2015 March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2473	F	2	3 C	4 C	5 C	2015 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		20	21 C	22 C	23 C	2015 May 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2474	F	16	17 C	18 C	19 C	2015 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		12	13 C	14 C	15 C	2015 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2477	F	9	10 C	11 C	12 C	2015 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		6	7 C	8 C	9 C	2015 September 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2478	F	20	21 C	22 C	23 C	2015 October 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		13	14 C	15 C	16 C	2015 November 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2479	F	13	14 C	15 C	16 C	2015 December 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		9	10 C	11 C	12 C	2016 January 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2480	F	6	7 C	8 C	9 C	2016 February 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		21	22 C	23 C	24 C	2016 March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2481	F	13	14 C	15 C	16 C	2016 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		9	10 C	11 C	12 C	2016 May 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2482	F	6	7 C	8 C	9 C	2016 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
		21	22 C	23 C	24 C	2016 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16