BAA Radio Astronomy Group. **2014 JULY**

	Xray class	Observers	John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola (21.75kHz)				Paul Hyde (22.1/23.4kHz)				Bob Middlefell (22.1kHz)				Mark Edwards (**20.9**/24.0/*19.6kHz*)			
			Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Tuned radio frequency receiver, 0.96m frame aerial.				Tuned radio frequency receiver, 0.5m frame aerial.				Spectrum Lab / PC 2m loop aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C6.6	5	*07:27*	*07:34*	*07:58*	*1+*					07:23	07:36	08:28	2+					07:30	07:45	08:47	2+
1	C2.1	3									09:03	09:20	09:59	2+					09:08	09:15	09:53	2
1	C6.0	6	10:07	10:18	10:48	2					10:07	10:21	?	-					10:08	10:20	?	-
1	**M1.4**	6	11:07	11:28	12:42	3					11:07	11:25	12:36	3					10:57	11:23	13:18	3+
2	*(C1.8)	1																	12:21	12:26	12:52	1+
2	C1.8	2	14:48	15:01	15:15	1+													14:55	15:03	15:38	2
2	*(C1.8)	1																	19:21	19:26	19:35	1-
3	?(C1.2)	1																	15:49	15:52	15:55	1-
3	*(C1.7)	1																	16:25	16:32	16:55	1+
3	?(C1.6)	1																	18:46	18:51	19:04	1-
4	C4.2	6	14:33	14:42	14:56	1					14:33	14:41	15:26	2+					14:33	14:43	15:31	2+
4	?(C1.3)	1																	*15:07*	*15:08*	*15:19*	*1-*
4	*(C1.7)	2									15:40	15:48	16:07	1+					15:41	15:48	16:09	1+
5	?(C1.5)	1																	17:32	17:34	?	-
5	?(C1.8)	1																	17:43	17:45	18:25	2
6	C3.5	3	*06:57*	*07:02*	*07:18*	*1*					06:58	07:02	07:32	2					*06:59*	*07:04*	*07:25*	*1+*
6	*(C3.5)	1																				
6	C2.9	5	08:11	08:16	08:31	1					08:10	08:18	09:17	2+					*08:06*	*08:19*	*?*	-
6	?(C2.8)	1																	*08:25*	*08:28*	*09:17*	*2+*
6	*(C2.0)	2	12:07	12:17	12:43	2													12:08	12:20	13:03	2+
6	*(C2.1)	1																	13:37	13:47	14:10	2
6	*(C1.8)	1																	15:46	15:56	16:34	2+
6	?(C1.7)	1																	17:21	17:27	17:59	2
7	C4.3	5	*08:00*	*08:04*	*08:17*	*1-*					08:00	08:04	09:13	2+					08:01	08:03	08:45	2
7	*(C2.1)	1																	**12:06**	**12:28**	**13:06**	**2+**
7	C2.3	1																	*18:21*	*18:23*	*18:33*	*1-*
8	C4.0	5	08:50	09:02	09:34	2					08:53	09:03	10:17	2+					08:58	09:08	?	-
8	*(C3.0)	1																	09:14	09:21	?	-
8	?(C2.2)	1																	09:41	09:49	10:19	2
8	**M6.5**	7	16:09	16:23	17:36	3					16:09	16:18	17:55	3	16:50	16:50	17:50	2+	16:09	16:21	17:10	2+
8	?(C2.6)	1																	18:33	18:37	19:04	1+
9	?(C1.7)	1																	12:30	12:37	12:53	1
9	C5.0	1																	18:38	18:43	19:18	2
10	?(C1.6)	1																	17:28	17:31	?	-
10	C1.4	1																	17:39	17:42	17:59	1
10	C7.4	1																	21:06	21:09	21:42	2
11	*(C1.0)	1																				
12	C2.5	3	*07:14*	*07:17*	*07:36*	*1*					07:13	07:17	07:39	1+					*07:14*	*07:24*	*07:41*	*1+*
12	*(C1.4)	1																	12:27	12:45	13:06	2
12	C1.7	2									13:24	13:27	13:37	1-					13:25	13:30	13:49	1
12	C4.6	6	14:04	14:12	14:52	2+					14:04	14:11	15:29	2+					14:06	14:10	15:15	2+

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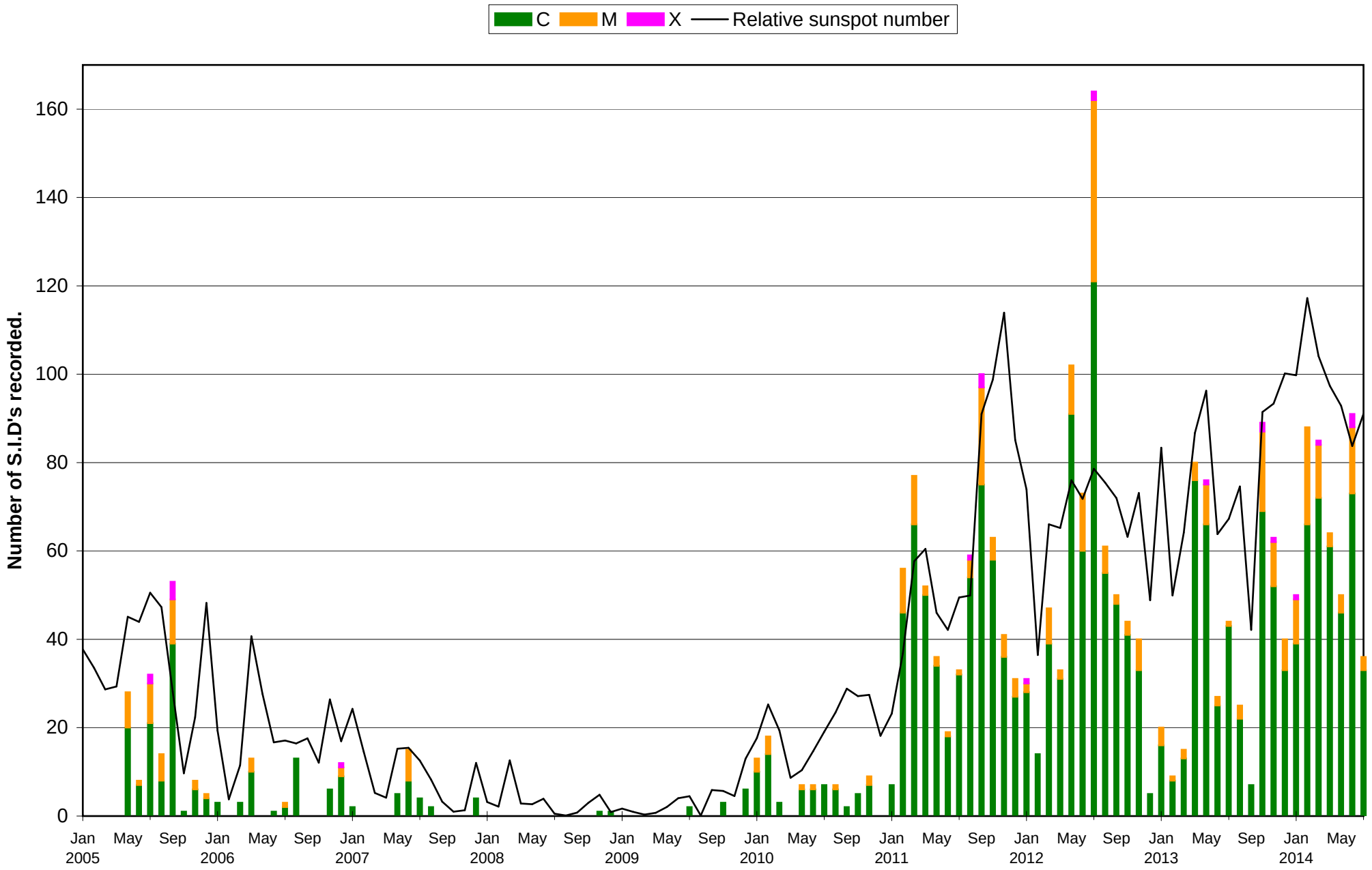
13	C1.7	3	08:14	08:20	08:35	1		08:20	08:22	08:35	1-		08:20	08:28	08:41	1
13	C6.4	6	08:45	09:03	09:50	2+		08:44	09:01	10:07	2+		08:47	09:01	09:48	2+
13	C1.2	1											14:35	14:41	14:59	1
14	C1.0	1	12:45	12:48	12:59	1-										
21	B5.9	1											18:44	18:50	19:07	1
25	C2.2	1	*07:01*	*07:05*	*07:14*	*1-*										
26	C1.0	1											11:40	11:45	11:55	1-
26	C1.1	2						12:09	12:11	12:25	1-		12:09	12:14	12:28	1
26	C1.8	3						13:18	13:24	13:53	2		13:19	13:22	13:46	1+
26	B8.9	1											15:14	15:16	15:21	1-
27	C2.5	1						05:49	05:52	?	-					
27	C1.2	1											14:15	14:18	14:40	1
29	C4.6	6	*16:26*	*16:30*	*17:09*	*2*		16:25	16:34	17:40	2+		16:27	16:34	17:18	2+
29	C1.6	1											18:11	18:15	18:28	1-
30	C9.0	5	*16:03*	*16:10*	*16:48*	*2*		16:02	16:17	18:00	3		16:04	16:13	17:18	2+
30	C3.6	1											18:45	18:49	19:17	1+
31	C1.8	2						09:17	09:23	09:46	1+		09:21	09:26	09:43	1
31	**M2.5**	5	11:05	11:13	12:28	2+		11:02	11:15	12:09	2+		11:02	11:11	12:15	2+
31	?(C1.7)	1											14:34	14:36	14:58	1
31	C3.5	4	*15:14*	*15:18*	*15:39*	*1*		15:11	15:20	16:01	2+		15:15	15:23	15:57	2
31	C1.9	1											18:49	18:56	19:07	1-

			Colin Clements (23.4kHz/*22.1kHz*)				Gordon Fiander (19.6/22.1kHz)			Richard Kaye (Various)			John Wardle (19.6/23.4kHz)				Steve Parkinson (Various)			
			AAVSO receiver, 0.76m screened loop aerial.				PC sound card.			Pre-amplifier + PC software receiver.			PC soundcard, 0.7m frame aerial.				Tuned radio frequency receiver, Spectrum Lab, frame aerials.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)	START	PEAK	END (UT)	START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C6.6												07:24	07:38	08:20	2+	07:25	07:37	08:15	2+
1	C2.1																09:00	09:20	09:40	2
1	C6.0		10:01	10:20	11:03	2+							10:07	10:16	10:42	2	10:09	10:18	10:40	1+
1	**M1.4**		11:03	11:25	14:34	3+							11:11	11:27	11:54	2	11:10	11:27	12:26	2+
2	*(C1.8)																			
2	C1.8																			
2	*(C1.8)																			
3	?(C1.2)																			
3	*(C1.7)																			
3	?(C1.6)																			
4	C4.2		14:32	14:40	15:24	2+							14:33	14:46	15:34	2+	14:33	14:40	14:55	1
4	?(C1.3)																			
4	*(C1.7)																			
5	?(C1.5)																			
5	?(C1.8)																			
6	C3.5																			
6	*(C3.5)																06:58	07:05	07:30	1+
6	C2.9												08:11	08:21	09:00	2+	08:12	08:18	08:42	1+
6	?(C2.8)																			

6	*(C2.0)																		
6	*(C2.1)																		
6	*(C1.8)																		
6	?(C1.7)																		
7	C4.3											07:59	08:05	08:54	2+	08:01	08:04	08:16	1-
7	*(C2.1)																		
7	C2.3																		
8	C4.0											08:56	09:09	10:24	3	08:54	09:03	10:10	2+
8	*(C3.0)																		
8	?(C2.2)																		
8	**M6.5**		16:08	16:23	17:52	3						16:10	16:23	17:14	2+	16:10	16:18	17:10	2+
8	?(C2.6)																		
9	?(C1.7)																		
9	C5.0																		
10	?(C1.6)																		
10	C1.4																		
10	C7.4																		
11	*(C1.0)		16:59	17:00	17:59	2+													
12	C2.5																		
12	*(C1.4)																		
12	C1.7																		
12	C4.6		14:01	14:12	15:54	3						14:03	14:11	15:00	2+	14:04	14:11	14:50	2+
13	C1.7																		
13	C6.4		08:43	09:01	10:04	2+						08:46	08:56	10:00	2+	08:46	08:59	09:49	2+
13	C1.2																		
14	C1.0																		
21	B5.9																		
25	C2.2																		
26	C1.0																		
26	C1.1																		
26	C1.8															13:19	13:23	13:48	1+
26	B8.9																		
27	C2.5																		
27	C1.2																		
29	C4.6		16:22	16:33	17:03	2						16:25	16:36	17:09	2	16:26	16:33	17:16	2+
29	C1.6																		
30	C9.0		16:03	16:14	16:39	2										16:04	16:14	17:00	2+
30	C3.6																		
31	C1.8																		
31	**M2.5**		11:00	11:14	12:32	3										11:06	11:18	12:15	2+
31	?(C1.7)																		
31	C3.5															15:15	15:20	15:42	1+
31	C1.9																		


VLF flare activity 2005/14.
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
Jan 2005
May
Sep
Jan 2006
May
Sep
Jan 2007
May
Sep
Jan 2008
May
Sep
Jan 2009
May
Sep
Jan 2010
May
Sep
Jan 2011
May
Sep
Jan 2012
May
Sep
Jan 2013
May
Sep
Jan 2014
May

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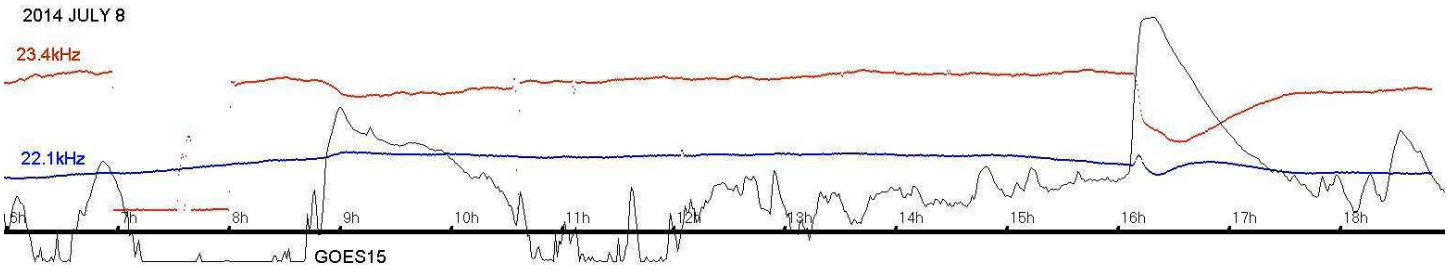
Activity in July was well down on the previous month, with just 38 flares recorded as SIDs. Only three of these were of M-class, with no X-class flares recorded. The SWPC bulletins do not show any X-class flares, the most energetic event being the M6.5 on the 8th. Between the 14th and 20th there are just 8 flares listed with a maximum of C1.2. The following week included mostly B-class, with a maximum of C2.5.

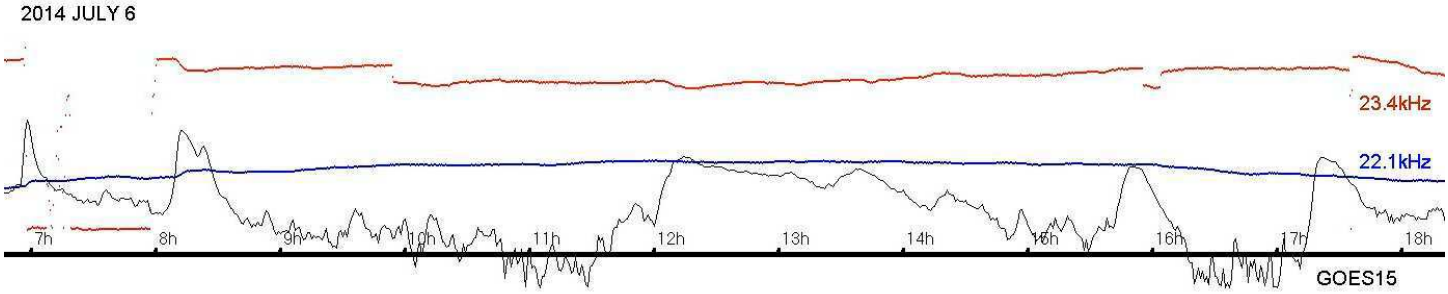
A look at the activity table shows that a total of 62 SIDs have been reported. As usual I have marked those SIDs that are listed by SWPC, but without classification, as '*', and those that are not listed as '?'. For this summary I have also added in brackets the X-ray magnitude of these events as recorded in the GOES15 raw data files. Many of these appear to be of reasonable magnitude, and all are above C1.0.

Some of these extra SIDs are due to multiple peaked flares, such as that seen on July 8th:

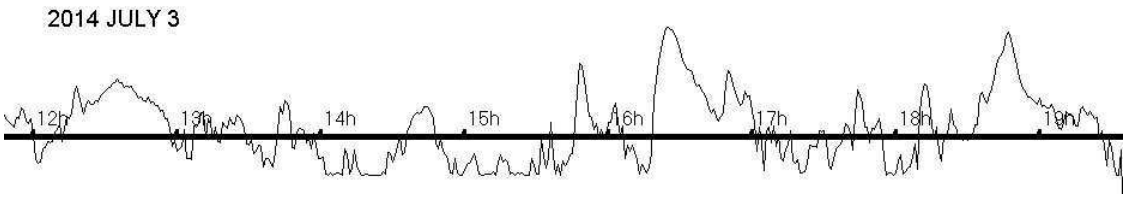


This is my own recording, with the GOES15 data added in black. The main peak of the C4.0 flare is clear at about 09UT, with a small secondary C3.0 peak at 09:20. A much broader peak (C2.2) follows at about 09:50. The M6.5 flare is also clearly recorded at 16:20.

A more complex pattern of flares occurred on the 6th:

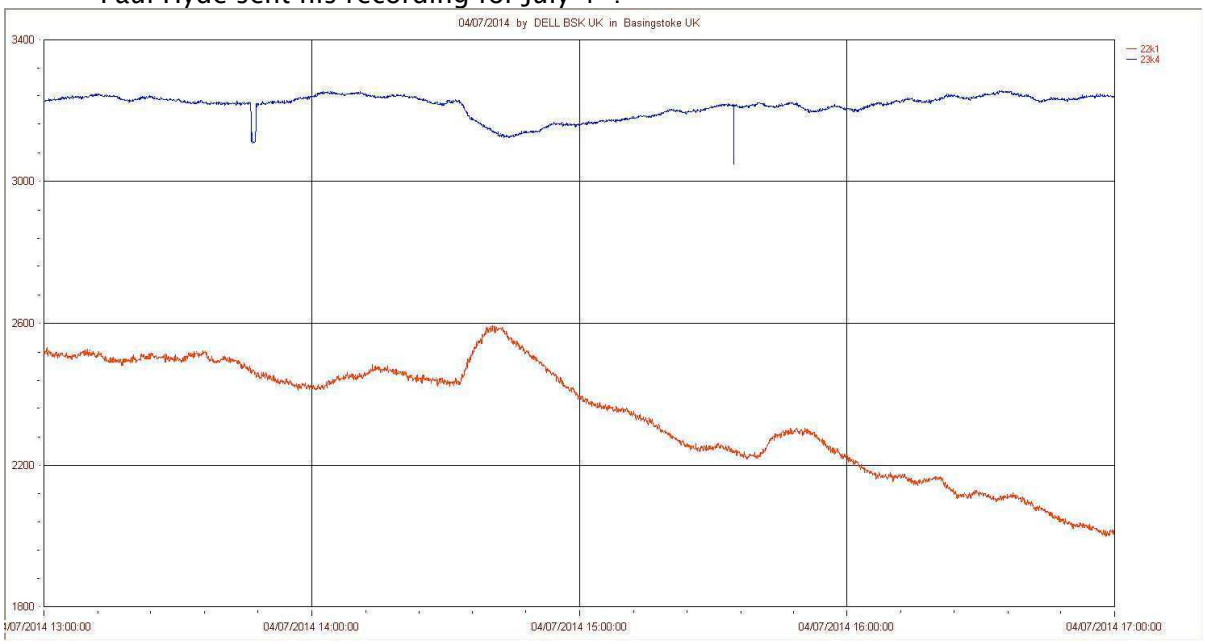


Again, I have added the GOES15 data to my own recording. The C2.9 flare at 08:20 has two peaks, the second being C2.8 just 10 minutes later. The C2.0 flare starting at 12UT lasts for about three hours, and includes a C2.1 peak at 13:50 as well as several others that we have not recorded as SIDs.



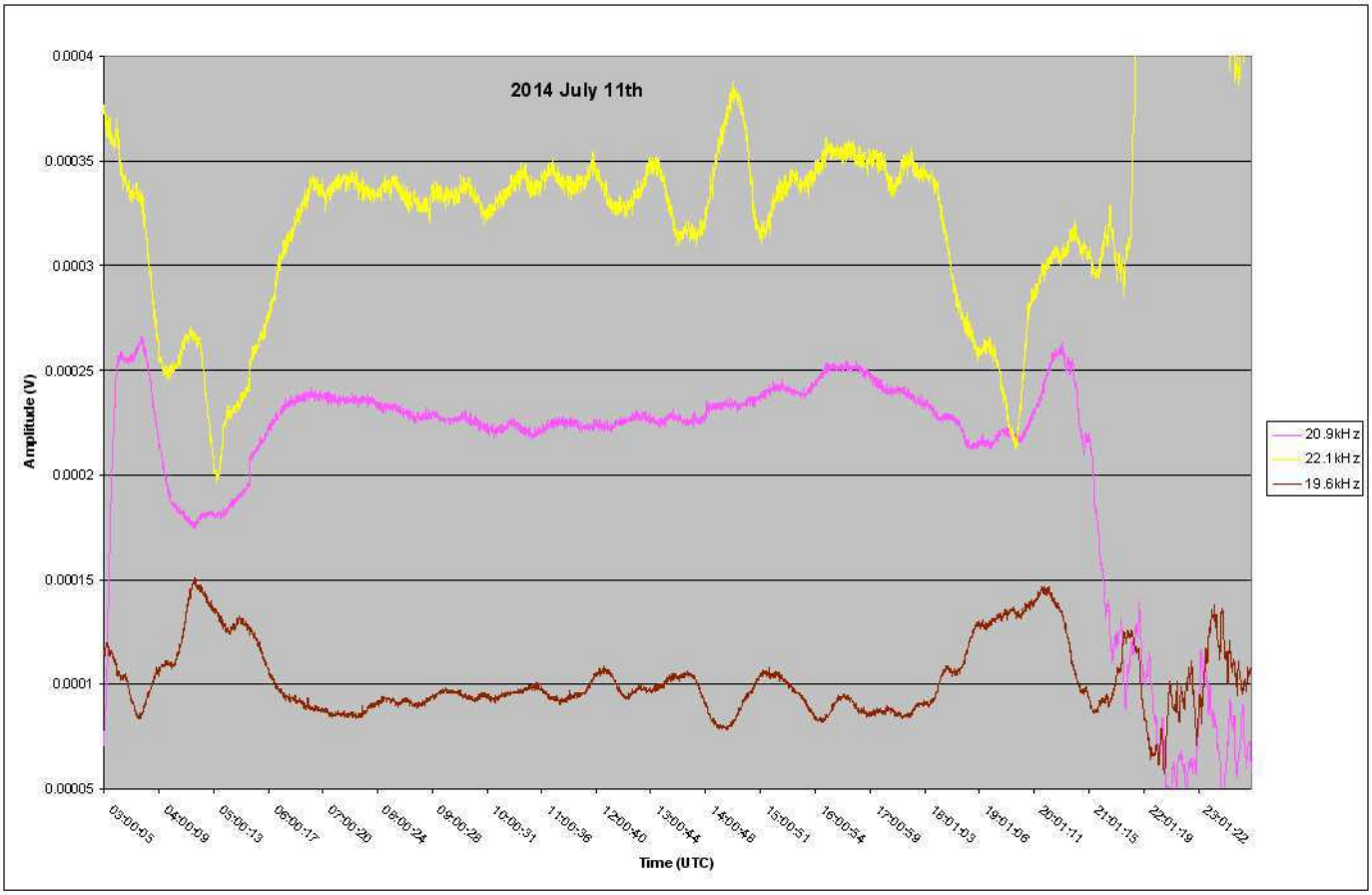
This chart shows just the GOES15 x-ray data for July 3rd. None of the three SIDs in the table are classified in the SWPC bulletins, but show clearly here; C1.2 at 15:50, C1.7 at 16:30 and C1.6 at 18:50.

Paul Hyde sent his recording for July 4th:



This shows the C4.2 flare at 14:41UT on both frequencies (red is 22.1kHz, blue is 23.4kHz). The C1.7 flare, unclassified in the SWPC bulletin, has also recorded well at 22.1kHz, but not 23.4kHz.

Mark Edwards recorded some large disturbances on July 11th:

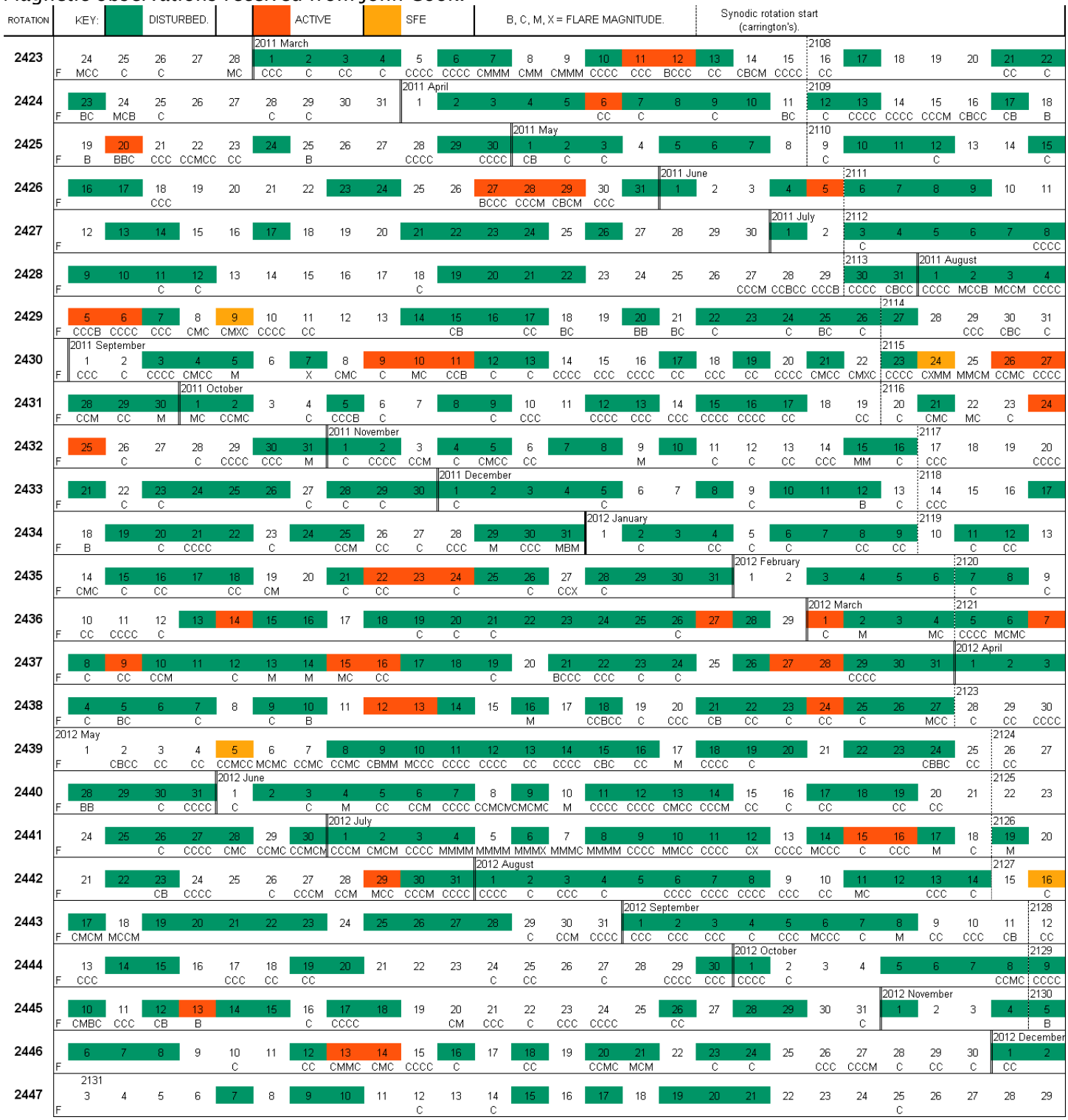


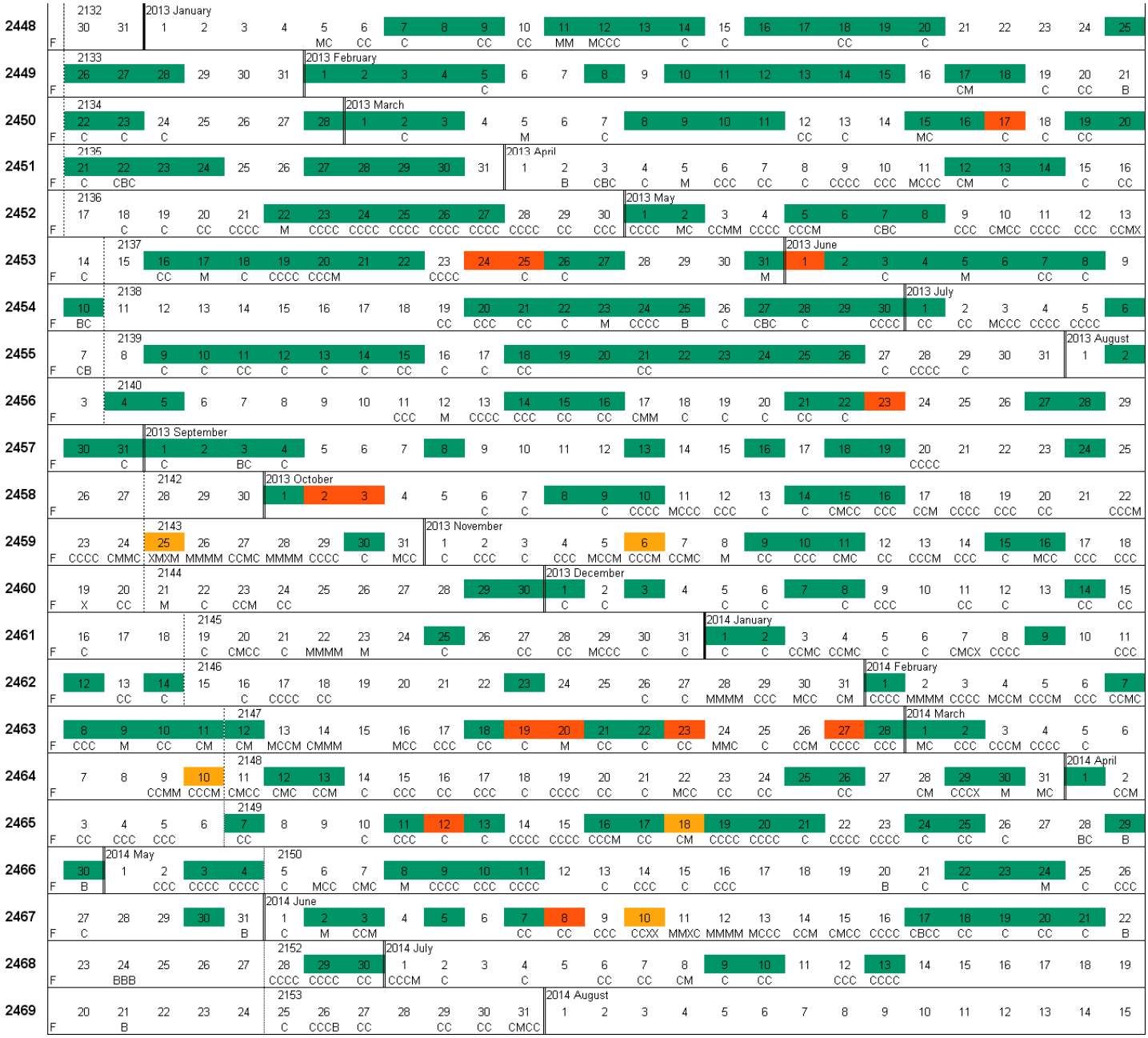
The X-ray background level was fairly high all day at about C1, although there do not appear to have been any discrete flares present. 20.9kHz (magenta) shows the least disturbance. 22.1kHz (yellow) and 19.6kHz (brown) both show some large excursions during the afternoon.

MAGNETIC OBSERVATIONS.

Only two periods of very minor magnetic disturbance are shown in the Bartels chart. Both were very short lived, and appear to be due to mild CHHSS effects. Although there were several CMEs during July, none were Earth directed, and no disturbances have been recorded.

Magnetic observations received from John Cook.




2448 2132 30 31 2013 January 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
F MC CC C CC CC MM MCCC C C CC C
2449 2133 26 27 28 29 30 31 2013 February 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
F C CM C CC B
2450 2134 22 23 24 25 26 27 28 2013 March 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
F C C C C M C CC C MC C C CC
2451 2135 21 22 23 24 25 26 27 28 29 30 31 2013 April 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
F C CBC B CBC C M CCC CC C CCCC CCC MCCC CM C C CC
2452 2136 17 18 19 20 21 22 23 24 25 26 27 28 29 30 2013 May 1 2 3 4 5 6 7 8 9 10 11 12 13
F C C CC CCCC M CCCC CCCC CCCC CCCC CCCC CCCC CC CCC CCCC MC CCMM CCCC CCCM CBC CCC CMCC CCCC CCC CCMX
2453 2137 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 2013 June 1 2 3 4 5 6 7 8 9
F C CC M C CCCC CCCM CCCC C C M C M CC C
2454 2138 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 2013 July 1 2 3 4 5 6
F BC CC CCC CC C M CCCC B C CBC C CCCC CC CC MCCC CCCC CCCC
2455 2139 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 2013 August 1 2
F CB C C CC C C C CC C C CC CC C CCCC C
2456 2140 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
F CCC M CCCC CCC CC CC CMM C C C CC C
2457 2013 September 30 31 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
F C C BC C CCCC
2458 2142 26 27 28 29 30 2013 October 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
F C C C CCCC MCCC CCC C C CMCC CCC CCM CCCC CCC CC CCCM
2459 2143 23 24 25 26 27 28 29 30 31 2013 November 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
F CCCC CMMC XMXM MMMM CCMC MMMM CCCC C MCC C CCC C CCC MCCM CCCM CCMC M CC CCC CMC CC CCCM CCC C MCC CCC CCC
2460 2144 19 20 21 22 23 24 25 26 27 28 29 30 2013 December 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
F X CC M C CCM CC C C C C C CCC CC C CC
2461 2145 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 2014 January 1 2 3 4 5 6 7 8 9 10 11
F C C CMCC C MMMM M C CC CC MCCC C C C C CCMC CCMC C C CMCX CCCC CCC
2462 2146 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 2014 February 1 2 3 4 5 6 7
F CC C C CCCC CC C C MMMM CCC MCC CM CCCC MMMM CCCC MCCM CCCM CCC CCMC
2463 2147 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 2014 March 1 2 3 4 5 6
F CCC M CC CM CM MCCM CMMM MCC CCC CC C M CC C CC MMC C CCM CCCC CCC MC CCC CCCM CCCC C
2464 2148 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 2014 April 1 2
F CCMM CCCM CMCC CMC CCM C CCC CC CCC C CCCC CC C MCC CC CC CC CC CM CCCX M MC CCM
2465 2149 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
F CC CCC CCC CC C CCC C C CCCC CCCC CCCM CC CM CCCC CCCC CCCC C CC C BC B
2466 2014 May 30 1 2 3 4 2150 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
F B CCC CCCC CCCC C MCC CMC M CCCC CCC CCCC C CCC C CCC B C C M C CCC
2467 27 28 29 30 31 2014 June 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
F C B C M CCM CC CC CCC CCXX MMXC MMMM MCCC CCM CMCC CCCC CBCC CC C CC C B
2468 2152 23 24 25 26 27 28 29 30 2014 July 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
F BBB CCCC CCCC CC CCCM C C CC CC CM C CC CCC CCCC
2469 2153 20 21 22 23 24 25 26 27 28 29 30 31 2014 August 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
F B C CCCB CC CC CC CMCC