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	Xray class	Observers	John Cook (23.4kHz/*22.1kHz*) Tuned radio frequency receiver, 0.58m frame aerial.				Roberto Battaiola (19.6kHz) Modified AAVSO receiver.				Paul Hyde (22.1/*23.4*/**19.6kHz**) Tuned radio frequency receiver, 0.96m frame aerial.				Bob Middlefell (22.1kHz) Tuned radio frequency receiver, 0.5m frame aerial.				Mark Edwards (**20.9**/24.0/*19.6kHz*) 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	C4.8	5	*11:40*	*11:43*	*11:55*	*1-*					11:35	11:45	12:12	2					11:39	11:48	12:23	2
1	*	1																	**13:55**	**14:16**	**14:33**	**2**
1	**M2.0**	6	14:46	14:58	16:16	3					14:46	14:54	16:19	3					14:46	14:49	15:48	2+
1	**M1.5**	5	*17:59*	*18:11*	*?*	-					17:59	18:16	?	-					17:59	18:12	19:46	3
2	C1.6	1																	10:46	10:50	10:57	1-
2	C2.7	1																	13:20	13:30	13:50	1+
3	C1.0	1																	12:17	12:23	12:47	1+
5	C1.7	3									11:28	11:33	12:03	2					11:29	11:32	12:06	2
5	C2.2	4	*14:15*	*14:19*	*14:37*	*1*					14:15	14:20	14:51	2					14:15	14:20	14:51	2
5	C2.5	1																	20:27	20:29	20:36	1-
8	C1.8	3									11:29	11:35	11:47	1-					11:32	11:34	11:56	1
8	C1.2	1																	12:50	13:03	13:18	1+
8	C1.0	1																	14:06	14:14	14:24	1-
8	C4.5	5	*17:00*	*17:02*	*17:28*	*1+*					17:00	17:04	17:29	1+					17:00	17:03	17:29	1+
9	C2.7	3	09:00	09:03	09:33	2													09:00	09:02	09:24	1
15	C1.1	1																	12:02	12:05	12:17	1-
15	C1.1	1																	13:19	13:20	?	-
15	?	1																	13:23	13:24	13:25	1-
16	C2.7	2																	09:29	09:31	09:51	1
18	C1.8	2																	**13:39**	**13:47**	**14:12**	**2**
20	C1.5	1																	09:09	09:19	09:38	1+
20	C4.9	6	12:40	12:51	13:45	2+					*12:41*	*12:51*	*14:48*	*3+*					12:41	12:53	13:46	2+
20	C1.3	1																	15:20	15:24	15:37	1-
20	C1.8	2																	16:21	16:24	16:37	1-
20	C2.6	1																	17:47	17:54	18:30	2
20	C3.2	1																	19:01	19:11	19:34	2
21	C1.2	1	11:59	12:01	12:16	1-																
21	**M3.4**	7	13:24	13:32	14:50	3	13:25	13:32	14:13	2+	*13:22*	*13:37*	*15:09*	*3*					13:23	13:33	14:47	2+
21	?	1																	15:09	15:18	15:31	1
21	C2.0	2																	15:47	15:52	16:22	2
21	C7.3	1																	19:00	19:08	20:26	3
22	**M1.2**	3	06:22	06:27	?	-					*06:24*	*06:28*	*06:36*	*1-*					**06:23**	**06:32**	**06:39**	**1-**
22	C2.6	1																	**08:32**	**08:42**	**08:47**	**1-**
22	C8.5	7	09:14	09:25	?	-	09:04	09:20	09:38	2	*09:14*	*09:27*	*10:19*	*2+*					09:14	09:26	10:13	2+
22	C2.2	3	10:21	10:31	11:14	2+													10:23	10:32	10:58	2
22	?	1																				
22	C6.4	7	12:53	12:59	13:54	2+	12:51	12:59	13:10	1	*12:53*	*13:00*	*13:57*	*2+*					12:52	12:59	13:59	2+
22	C6.2	5	15:47	15:52	16:15	1+													15:45	15:53	16:43	2+
23	C1.3	2																	11:26	11:32	11:43	1-
23	C2.2	3																	14:11	14:16	14:59	2+
23	C6.0	2																	17:24	17:28	17:52	1+
23	C2.9	1																	18:15	18:19	18:42	1+

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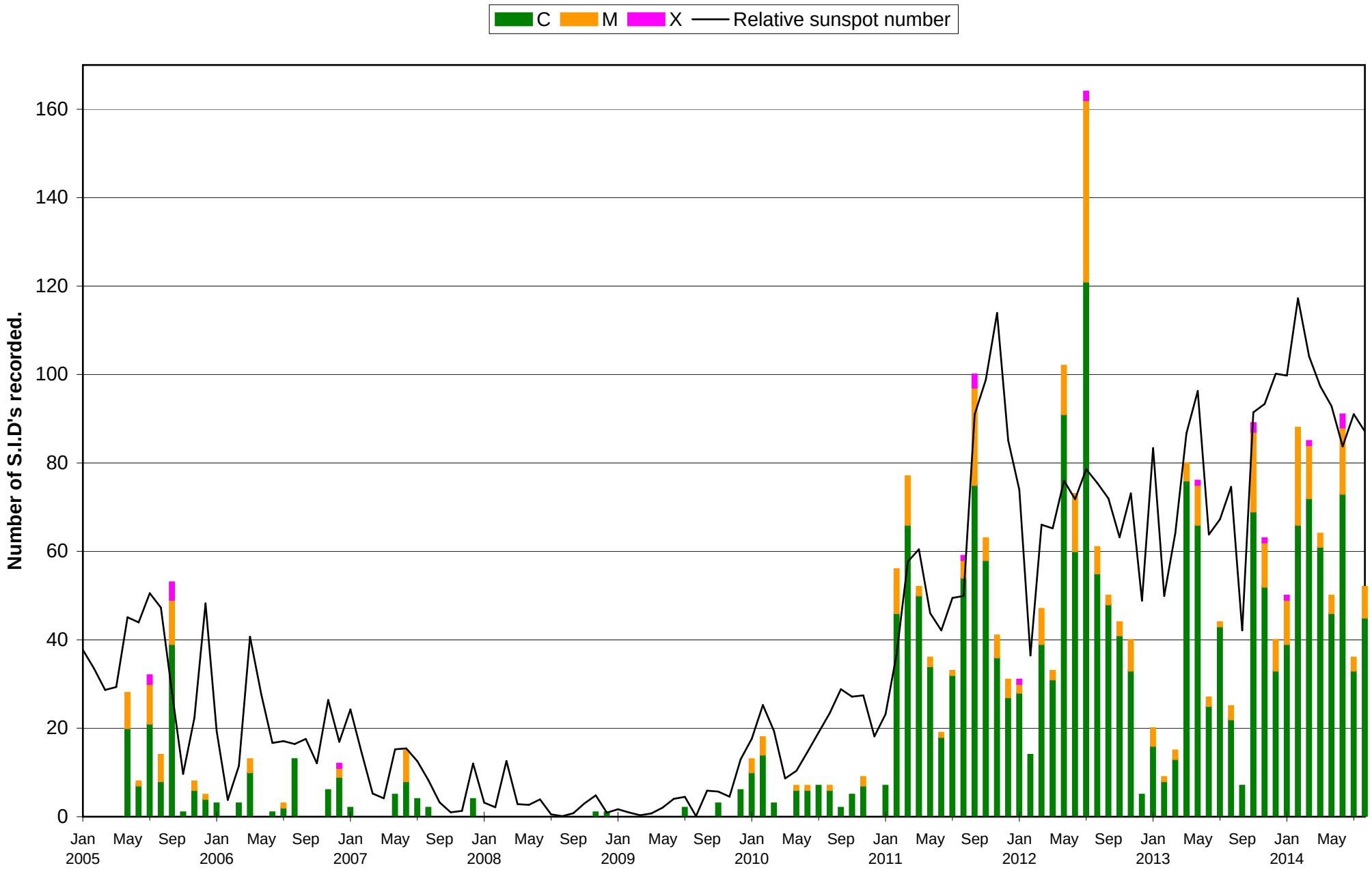
24	C1.7	1													10:45	10:53	11:05	1
24	**M5.9**	7	12:10	12:19	14:05	3	12:08	12:19	13:09	2+	*12:09*	*12:24*	*14:59*	*3+*	12:05	12:21	14:16	3+
24	C1.8	1													17:22	17:27	17:43	1
25	**M2.0**	6	14:49	15:11	16:18	3	14:52	15:10	15:45	2+	*14:49*	*15:18*	*16:21*	*3*	**14:48**	**15:12**	**16:37**	**3**
25	**M3.9**	1													20:10	20:22	20:52	2
26	C1.9	4	09:26	09:30	09:38	1-									09:27	09:31	09:45	1-
26	?	2													11:37	11:47	?	-
26	?	2													12:08	12:28	?	-
26	?	2													12:39	12:56	13:39	2+
26	?	2													15:04	15:18	15:54	2+
28	C1.9	3	15:35	15:41	15:56	1									15:14	15:25	?	-
28	?	1													15:47	15:50	16:08	1
28	B8.4	1																
29	C4.3	5	15:47	15:54	?	-									**15:50**	**15:59**	**16:15**	**1**
30	C2.0	3	10:17	10:20	10:30	1-									10:18	10:20	10:30	1-
30	C2.8	4	14:24	14:27	14:37	1-									14:25	14:27	15:00	2
30	B9.8	1													18:32	18:36	18:44	1-
31	C3.6	2													11:18	11:22	11:38	1
31	C7.1	7	12:09	12:13	?	-	12:03	12:13	12:39	2	**12:09**	**12:14**	**12:34**	**1**	12:09	12:14	13:14	2+
31	?	1													13:51	13:54	14:12	1
31	?	1													14:33	14:36	14:41	1-
31	C2.1	3													15:33	15:37	15:48	1-
31	C2.2	1													17:32	17:35	17:57	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 receivers, frame aerials.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C4.8														11:37	11:48	12:17	2	11:37	11:47	12:10	2
1	*																					
1	**M2.0**		14:45	14:53	15:29	2									14:45	14:54	15:45	2+	14:47	14:54	15:30	2
1	**M1.5**														18:00	18:19	19:00	2+	18:00	18:14	18:40	2
2	C1.6																					
2	C2.7																					
3	C1.0																					
5	C1.7		11:26	11:31	12:08	2																
5	C2.2		14:13	14:19	14:50	2																
5	C2.5																					
8	C1.8																		11:31	11:35	11:50	1
8	C1.2																					
8	C1.0																					
8	C4.5		16:59	17:02	17:17	1-													17:00	17:04	17:25	1
9	C2.7																		09:00	09:03	09:25	1
15	C1.1																					
15	C1.1																					
15	?																					

16	C2.7		09:25	09:31	09:52	1+												
18	C1.8		13:25	13:50	14:52	3												
20	C1.5																	
20	C4.9		12:13	12:50	14:38	3+			12:45	12:52	13:10	1	12:42	12:52	13:40	2+		
20	C1.3																	
20	C1.8		16:17	16:24	17:12	2+												
20	C2.6																	
20	C3.2																	
21	C1.2																	
21	**M3.4**		13:19	13:33	15:05	3			13:23	13:34	14:17	2+	13:24	13:31	14:30	2+		
21	?																	
21	C2.0		15:43	15:49	16:03	1												
21	C7.3																	
22	**M1.2**																	
22	C2.6																	
22	C8.5		09:09	09:25	10:14	2+			09:17	09:26	09:45	1+	09:15	09:25	10:08	2+		
22	C2.2		10:14	10:30	11:17	2+												
22	?		11:43	12:08	12:40	2+												
22	C6.4		12:50	12:57	13:58	2+			12:53	13:02	13:16	1	12:53	13:00	13:30	2		
22	C6.2		15:41	15:52	17:40	3			15:38	15:44	15:54	1-	15:45	15:55	16:30	2		
23	C1.3		11:15	11:28	11:48	2												
23	C2.2		14:07	14:14	14:30	1							14:13	14:20	14:45	1+		
23	C6.0								17:24	17:35	17:49	1						
23	C2.9																	
24	C1.7																	
24	**M5.9**		11:42	12:18	15:55	3+			12:11	12:20	13:43	3	12:12	12:20	13:30	2+		
24	C1.8																	
25	**M2.0**		14:44	15:12	16:52	3+							14:52	15:12	16:00	2+		
25	**M3.9**																	
26	C1.9		09:22	09:30	09:51	1+			09:25	09:33	09:56	1+						
26	?		11:29	11:44	12:00	1+												
26	?		12:00	12:22	12:36	2												
26	?		12:36	12:56	13:49	2+												
26	?		15:02	15:09	15:50	2+												
28	C1.9		15:06	15:20	15:49	2												
28	?																	
28	B8.4		16:21	16:22	16:56	2												
29	C4.3		15:45	15:54	16:17	1+			15:48	15:57	16:12	1	15:49	15:56	16:25	2		
30	C2.0		10:16	10:18	10:31	1-												
30	C2.8		14:21	14:25	15:07	2+			14:23	14:32	14:52	1+						
30	B9.8																	
31	C3.6								11:22	11:27	11:35	1-						
31	C7.1		12:04	12:11	13:00	2+			11:48	12:13	12:36	2+	12:09	12:12	12:40	1+		
31	?																	
31	?																	
31	C2.1		15:28	15:33	15:51	1							15:33	15:38	15:55	1		
31	C2.2																	


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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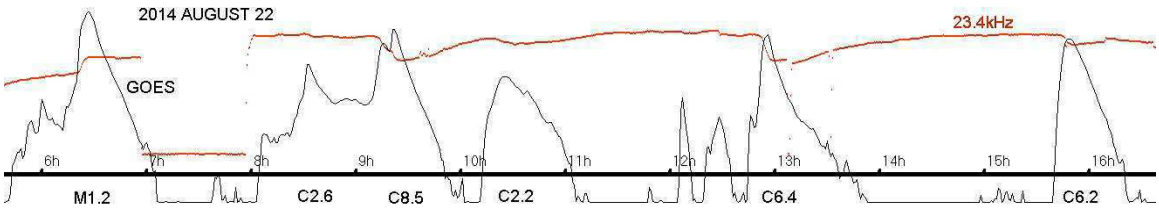
August flare activity increased a little over July, with 64 flares recorded at SIDs. There were no X-class flares, the most energetic event of the month being the M5.9 flare on the 24th. The first half of August was particularly quiet, with mostly B-class flares shown in the GOES data. Some of the VLF signals were off for part of the time, 22.1kHz (Anthorn) missing from 10UT on the 11th until September 4th.

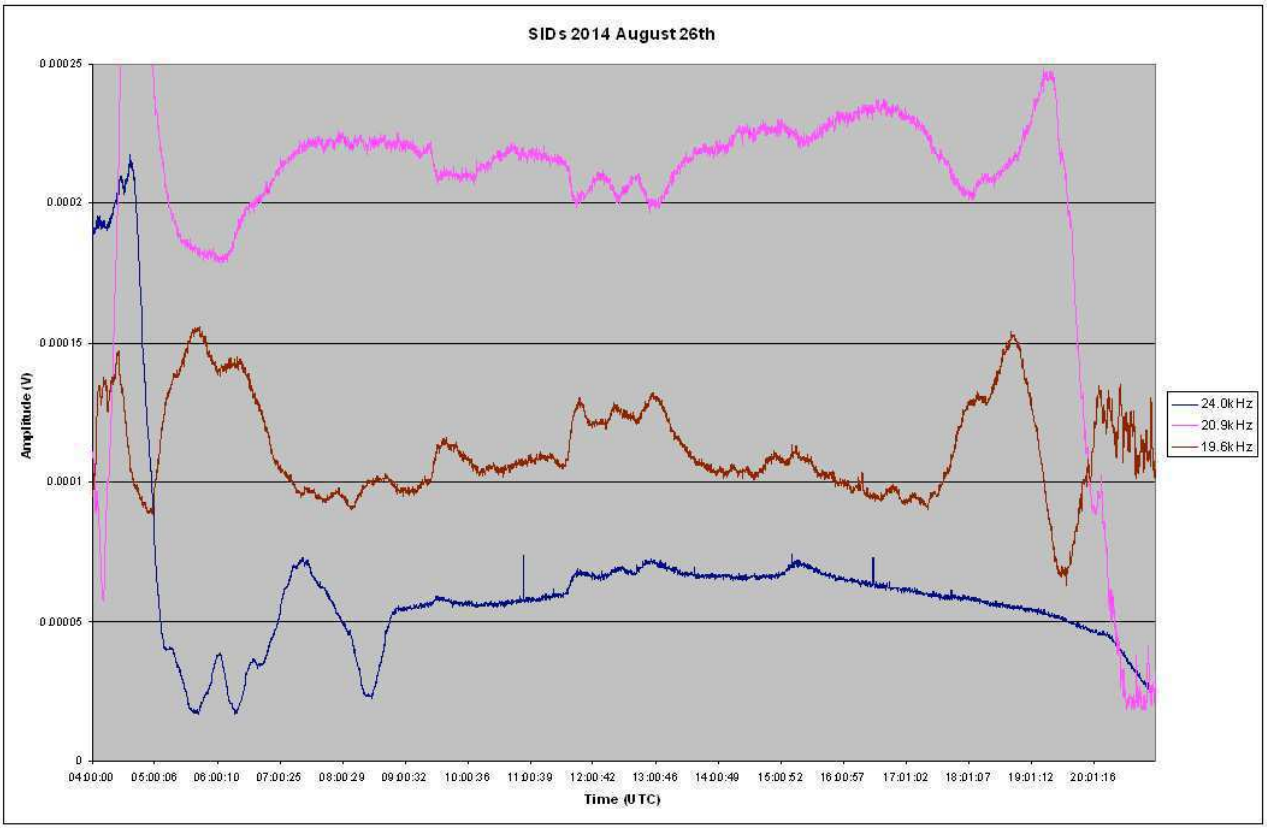
23.4kHz was also off for a short period overnight on July 31st/August 1st, but came back just in time to record a nice pair of M-class flares in the afternoon. The SID from the M1.2 event was distorted due to local sunset effects, but the start and peak were clear enough. Both Colin Clements and my own recordings show some significant noise on signals, particularly in the first 10 days.

August 22nd showed the longest period of sustained activity, as shown in my recording:

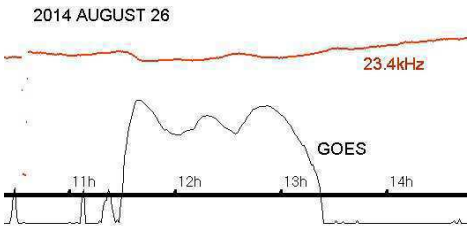


This activity was produced by AR12149, a large complex group on the Eastern limb, and AR12146, a much smaller group nearer the centre of the solar disc. These two groups were responsible for much of the flare activity over the following week.

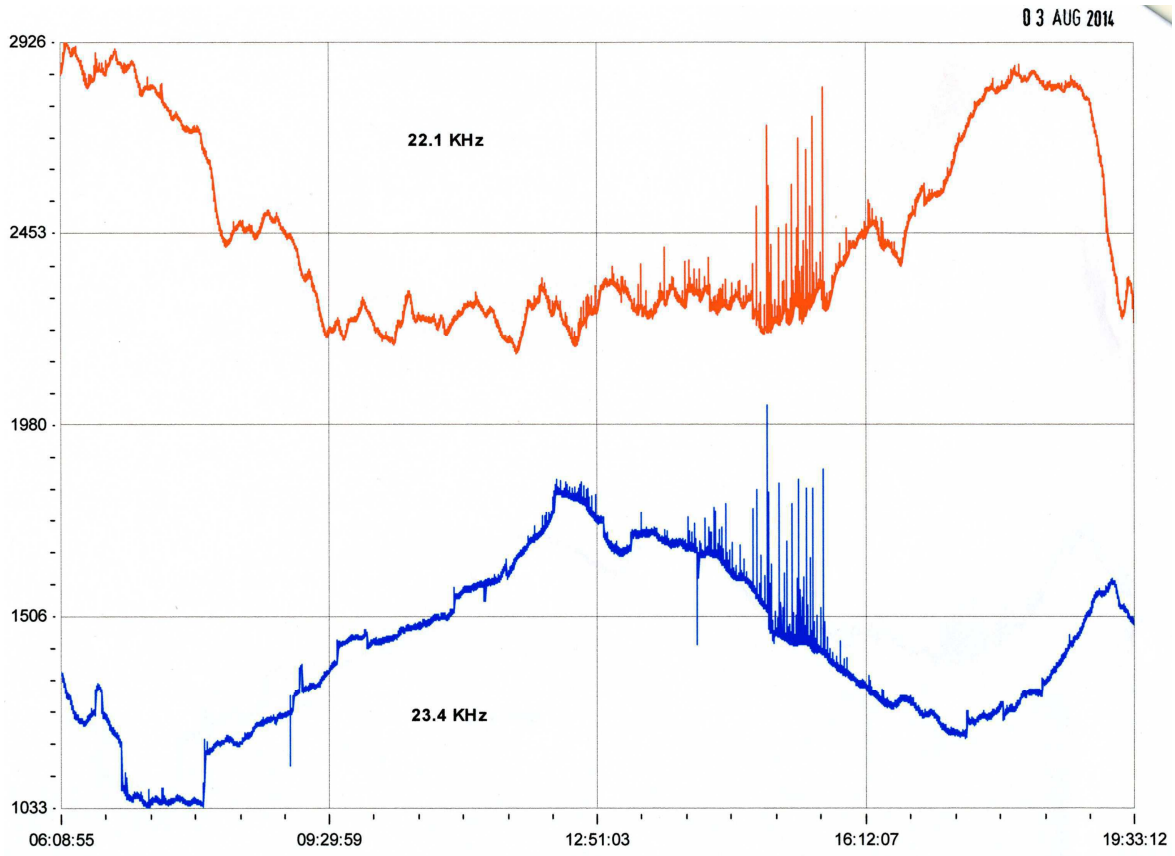
The source of the triple peaked SID on the 26th is unknown, as it is not listed in the SWPC bulletin.



This recording by Mark Edwards shows all three peaks quite clearly at 19.6kHz (brown) and 20.9kHz (Magenta), but less well at 24kHz (Blue).



The GOES data (black) also clearly shows a triple flare, although my 23.4kHz receiver has not reacted very well. The peaks are about C1.6. A very unstable 23.4kHz signal on the 31st caused the C7.1 SID to appear as double peaked, although the flare itself was a very short single event.

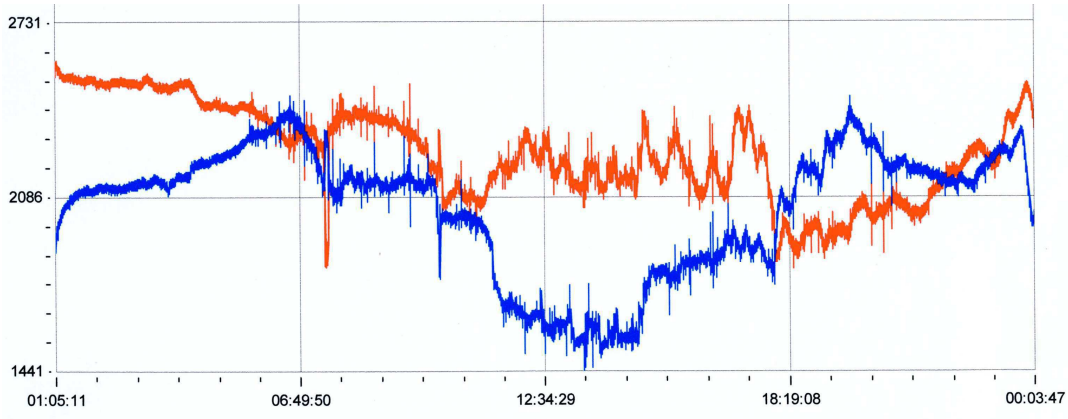


This chart recorded by Colin Clements shows a fairly strong and slow oscillation at 22.1kHz for most of the day on the 3rd. Some local interference obscures the effect for about an hour from 14:50UT. Mark Edwards also noted a strong 10 minute oscillation at 19.6kHz on the 28th, again lasting through most of the day.

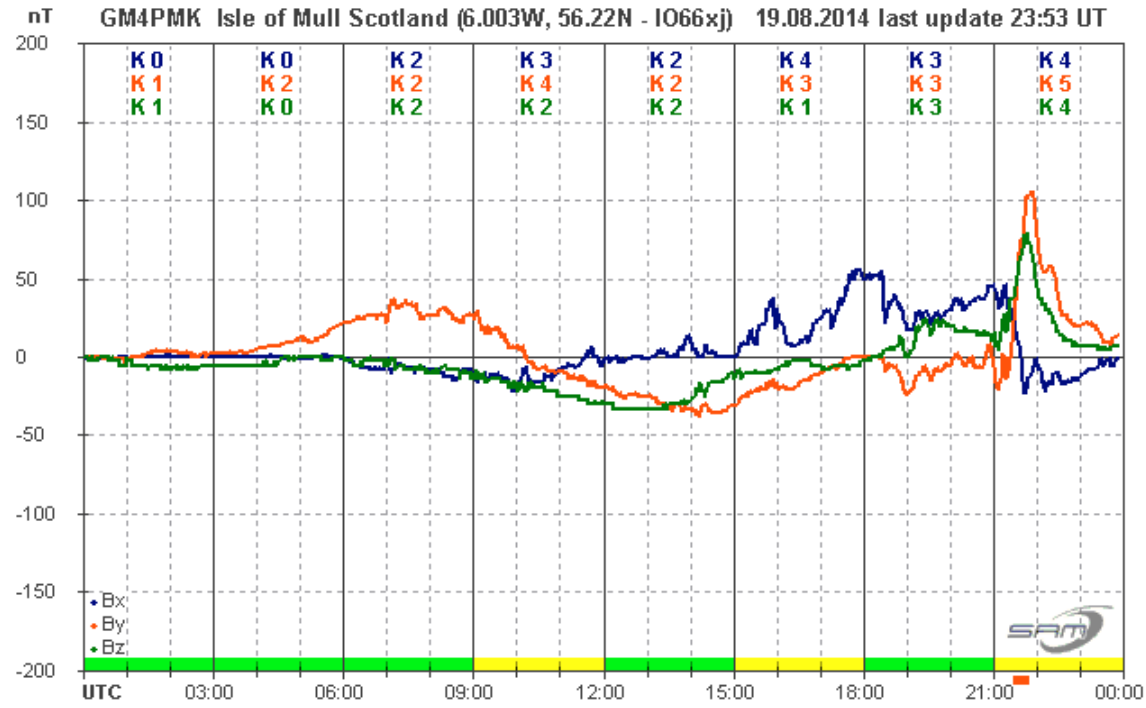
MAGNETIC OBSERVATIONS.

There was a much higher level of magnetic activity in August compared to July. Much of it was from Coronal hole effects, but there were also a number of CME's caused by flares and filament eruptions.

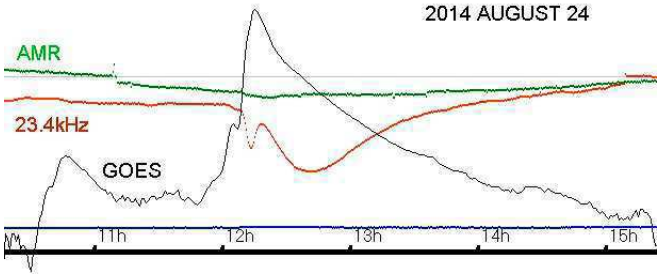
The high level of activity on the 22nd produced a complex CME, primarily from the C2.2 and C6.4 flares. This was Earth-directed, and produced some rapid variations in the magnetic field during the afternoon and evening of the 27th. No sudden storm commencement is evident in our recordings, but the disturbance seems to have started around 12UT. Using the C6.4 SID peak at 13:00 on the 22nd gives a rough transit time of 119 hours, among the slowest that we have recorded. The chart on the next page by Colin Clements shows the disturbance well:



X-field in red, Y-field in blue. A filament eruption at about 17UT on the 15th caused a two hour disturbance starting at 21:15 on the 19th, with a shift of 90nT in my own recording. This recording by Roger Blackwell shows a similar disturbance of just over 100nT:



The M5.9 flare on the 24th produced a very subtle SFE at 12:12 in my recording. This is a few minutes before the peak of the SID at about 12:20. In GOES15 data, the flare starts at 12:00 with a small dip at 12:07 before peaking at 12:16UT.



The SFE dip is about 6nT, not to be confused with the interference spike just after 11:00.

Magnetic observations received from Roger Blackwell, Colin Clements, John Cook, Gonzalo Vargas.
Reports and observations to jacook@jacook.plus.com.

BAA Radio Astronomy Group

BARTELS DIAGRAM

ROTATION	KEY:	🟩	DISTURBED.	🟥	ACTIVE	🟧	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).

2423	24	25	26	27	28	2011 March 🟩 1	🟩 2	🟩 3	🟩 4	5	🟩 6	🟩 7	8	9	🟩 10	🟥 11	🟥 12	🟩 13	14	15	2108 16	🟩 17	18	19	20	🟩 21	🟩 22
F	MCC	C	C		MC	CCC	C	CC	C	CCCC	CCCC	CMMM	CMM	CMMM	CCCC	CCC	BCCC	CC	CBCM	CCCC	CC					CC	C
2424	🟩 23	24	25	26	27	28	29	30	31	2011 April 1	🟩 2	🟩 3	🟩 4	🟩 5	🟥 6	🟩 7	🟩 8	🟩 9	🟩 10	11	2109 🟩 12	🟩 13	14	15	16	🟩 17	18
F	BC	MCB	C			C	C								CC	C		C		BC	C	CCCC	CCCC	CCCM	CBCC	CB	B
2425	19	🟥 20	21	22	23	🟩 24	25	26	27	28	🟩 29	🟩 30	2011 May 🟩 1	🟩 2	🟩 3	4	🟩 5	🟩 6	🟩 7	8	2110 9	🟩 10	🟩 11	🟩 12	13	14	🟩 15
F	B	BBC	CCC	CCMCC	CC		B			CCCC		CCCC	CB	C	C						C			C			C
2426	🟩 16	🟩 17	18	19	20	21	22	🟩 23	🟩 24	25	26	🟥 27	🟥 28	🟥 29	30	🟩 31	2011 June 🟩 1	2	3	🟩 4	🟥 5	2111 🟩 6	🟩 7	🟩 8	🟩 9	10	11
F			CCC									BCCC	CCCM	CBCM	CCC												
2427	12	🟩 13	🟩 14	15	16	🟩 17	18	19	20	🟩 21	🟩 22	🟩 23	🟩 24	25	🟩 26	27	28	29	30	2011 July 🟩 1	2	2112 🟩 3	🟩 4	🟩 5	🟩 6	🟩 7	🟩 8
F																						C					CCCC
2428	🟩 9	🟩 10	🟩 11	🟩 12	13	14	15	16	17	18	🟩 19	🟩 20	🟩 21	🟩 22	23	24	25	26	27	28	29	2113 🟩 30	🟩 31	2011 August 🟩 1	🟩 2	🟩 3	🟩 4
F			C	C						C									CCCM	CCBCC	CCCB	CCCC	CBCC	CCCC	MCCB	MCCM	CCCC
2429	🟥 5	🟥 6	🟩 7	8	🟧 9	10	11	12	13	🟩 14	🟩 15	🟩 16	🟩 17	18	19	🟩 20	21	🟩 22	🟩 23	🟩 24	🟩 25	🟩 26	2114 🟩 27	28	29	30	31
F	CCCB	CCCC	CCC	CMC	CMXC	CCCC	CC				CB		CC	BC		BB	BC	C		C	BC	C			CCC	CBC	C
2430	2011 September 1	2	🟩 3	🟩 4	🟩 5	6	🟩 7	8	🟥 9	🟥 10	🟥 11	🟩 12	🟩 13	14	15	16	🟩 17	18	🟩 19	20	🟩 21	22	2115 🟩 23	🟧 24	25	🟥 26	🟥 27
F	CCC	C	CCCC	CMCC	M		X	CMC	C	MC	CCB	C	C	CCCC	CCC	CCCC	CC	CCC	CC	CCCC	CMCC	CMXC	CCCC	CXMM	MMCM	CCMC	CCCC
2431	🟩 28	🟩 29	🟩 30	2011 October 🟩 1	🟩 2	3	4	🟩 5	6	7	🟩 8	🟩 9	10	11	🟩 12	🟩 13	14	🟩 15	🟩 16	🟩 17	18	19	2116 20	🟩 21	22	23	🟥 24
F	CCM	CC	M	MC	CCMC		C	CCCB	C			C	CCC		CCCC	CCC	CCC	CCCC	CCCC	CC		CC	C	CMC	MC	C	
2432	🟥 25	26	27	28	29	🟩 30	🟩 31	2011 November 🟩 1	🟩 2	3	🟩 4	🟩 5	6	🟩 7	🟩 8	9	🟩 10	11	12	13	14	🟩 15	🟩 16	2117 17	18	19	20
F		C		C	CCCC	CCC	M	C	CCCC	CCM	C	CMCC	CC			M		C	C	CC	CCC	MM	C	CCC			CCCC
2433	🟩 21	22	🟩 23	🟩 24	🟩 25	🟩 26	27	🟩 28	🟩 29	🟩 30	2011 December 🟩 1	🟩 2	🟩 3	🟩 4	🟩 5	6	7	🟩 8	9	🟩 10	🟩 11	🟩 12	13	2118 14	15	16	🟩 17
F		C	C				C	C	C		C				C				C			B	C	CCC			
2434	18	🟩 19	🟩 20	🟩 21	🟩 22	23	🟩 24	🟩 25	26	27	28	🟩 29	🟩 30	🟩 31	2012 January 1	🟩 2	🟩 3	🟩 4	5	🟩 6	🟩 7	🟩 8	🟩 9	2119 10	🟩 11	🟩 12	13
F	B		C	CCCC		C		CCM	CC	C	CCC	M	CCC	MBM		C		CC	C	C		CC	CC		C	CC	
2435	14	🟩 15	🟩 16	🟩 17	🟩 18	19	20	🟩 21	🟥 22	🟥 23	🟥 24	🟩 25	🟩 26	27	🟩 28	🟩 29	🟩 30	🟩 31	2012 February 1	2	🟩 3	🟩 4	🟩 5	🟩 6	2120 🟩 7	🟩 8	9
F	CMC	C	CC		CC	CM		C	CC		C		C	CCX	C										C		C
2436	10	11	12	🟩 13	🟥 14	🟩 15	🟩 16	17	🟩 18	🟩 19	🟩 20	🟩 21	🟩 22	🟩 23	🟩 24	🟩 25	🟩 26	🟥 27	🟩 28	29	2012 March 🟥 1	🟩 2	🟩 3	🟩 4	2121 🟩 5	🟩 6	🟥 7
F	CC	CCCC	C							C	C	C					C				C	M		MC	CCCC	MCMC	
2437	🟩 8	🟥 9	🟩 10	🟩 11	🟩 12	🟩 13	🟩 14	🟥 15	🟥 16	🟩 17	🟩 18	🟩 19	20	🟩 21	🟩 22	🟩 23	🟩 24	25	🟩 26	🟥 27	🟥 28	🟩 29	🟩 30	🟩 31	2012 April 🟩 1	🟩 2	🟩 3
F	C	CC	CCM		C	M	M	MC	CC			C		BCCC	CCC	C	C					CCCC					
2438	🟩 4	🟩 5	🟩 6	🟩 7	8	🟩 9	🟩 10	11	🟥 12	🟥 13	🟩 14	15	🟩 16	17	🟩 18	19	20	🟩 21	🟩 22	🟩 23	🟥 24	🟩 25	🟩 26	🟩 27	2123 28	29	30
F	C	BC		C		C	B						M		CCBCC	C	CCC	CB	CC	C	CC	C		MCC	C	CC	CCCC
2439	2012 May 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	2124 26	27
F		CBCC	CC	CC	CCMCC	MCMC	CCMC	CCMC	CBMM	MCCC	CCCC	CCCC	CC	CCCC	CBC	CC	M	CCCC	C					CBBC	CC	CC	
2440	🟩 28	🟩 29	🟩 30	🟩 31	2012 June 1	🟩 2	🟩 3	🟩 4	🟩 5	🟩 6	🟩 7	8	🟩 9	10	🟩 11	🟩 12	🟩 13	🟩 14	15	16	🟩 17	🟩 18	🟩 19	20	21	2125 22	23
F	BB		C	CCCC	C		C	M	CC	CCM	CCCC	CCMCM	CMCMC	M	CCCC	CCCC	CMCC	CCCM	CC	C	CC		CC	CC			
2441	24	🟩 25	🟩 26	🟩 27	🟩 28	29	🟩 30	2012 July 🟩 1	🟩 2	🟩 3	🟩 4	5	🟩 6	7	🟩 8	🟩 9	🟩 10	🟩 11	🟩 12	13	🟩 14	🟥 15	🟥 16	🟩 17	18	2126 🟩 19	20
F			C	CCCC	CMC	CCMC	CCMCM	CCCM	CMCM	CCCC	MMMM	MMMM	MMMX	MMMC	MMMM	CCCC	MMCC	CCCC	CX	CCCC	MCCC	C	CCC	M	C	M	
2442	21	🟩 22	🟩 23	24	25	26	27	28	🟥 29	🟩 30	🟩 31	2012 August 🟩 1	🟩 2	🟩 3	🟩 4	🟩 5	🟩 6	🟩 7	🟩 8	9	10	🟩 11	🟩 12	🟩 13	🟩 14	2127 15	🟧 16
F			CB	CCCC		C	CCCM	CCM	MCC	CCCM	CCCC	CCCC	C	CCC	C		CCCC	CCCC	CCCC	CCC	CC	MC		CCC	C		C
2443	🟩 17	18	🟩 19	🟩 20	🟩 21	🟩 22	🟩 23	24	🟩 25	🟩 26	🟩 27	🟩 28	29	30	31	2012 September 🟩 1	🟩 2	🟩 3	🟩 4	🟩 5	🟩 6	🟩 7	🟩 8	9	10	11	2128 12
F	CMCM	MCCM											C	CCM	CCCC	CCC	CCC	CCC	C	CCC	MCCC	C	M	CC	CCC	CB	CC
2444	13	🟩 14	🟩 15	16	17	18	🟩 19	🟩 20	21	22	23	24	25	26	27	28	29	🟩 30	2012 October 🟩 1	2	3	4	🟩 5	🟩 6	🟩 7	🟩 8	2129 🟩 9
F	CCC				CCC	CC	CC					C	CC		C		CCCC	CCC	CCCC	C						CCMC	CCCC
2445	🟩 10	11	🟩 12	🟥 13	🟩 14	🟩 15	16	🟩 17	🟩 18	19	20	21	22	23	24	25	🟩 26	27	🟩 28	🟩 29	30	31	2012 November 🟩 1	2	3	🟩 4	2130 🟩 5
F	CMBC	CCC	CB	B			C	CCCC			CM	CCC	C	CCC	CCCC		CC					C					B
2446	🟩 6	🟩 7	🟩 8	9	10	11	🟩 12	🟥 13	🟥 14	15	🟩 16	17	🟩 18	19	🟩 20	🟩 21	22	🟩 23	🟩 24	25	26	27	28	29	30	2012 December 🟩 1	🟩 2
F					C		CC	CMMC	CMC	CCCC	C		CC		CCMC	MCM		C	C		CCC	CCCM	C	CC	C	CC	
2447	2131 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										C		C											C				
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	14	2137 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	🟩 10	2138 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	7	2139 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	3	2140 🟩 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	🟩 30	🟩 31	2013 September 🟩 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	26	27	2142 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	23	24	2143 🟧 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	19	20	2144 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

BAA Radio Astronomy Group

BARTELS DIAGRAM

	F	X	CC	M	C	CCM	CC							C	C			C	C		C	CCC		CC	C		CC	CC
					2145													2014 January										
2461		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	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
					2146																	2014 February						
2462		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	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
						2147																	2014 March					
2463		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	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	
						2148																					2014 April	
2464		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	1	2
	F			CCMM	CCCM	CMCC	CMC	CCM	C	CCC	CC	CCC	C	CCCC	CC	C	MCC	CC	CC		CC		CM	CCCX	M	MC		CCM
						2149																						
2465		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	C	CCCC	CCCC	C	CC	C		BC	B
			2014 May				2150																					
2466		30	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	26
	F	B		CCC	CCCC	CCCC	C	MCC	CMC	M	CCCC	CCC	CCCC		C	CCC	C	CCC				B	C	C		M	C	CCC
							2014 June																					
2467		27	28	29	30	31	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
							2152			2014 July																		
2468		23	24	25	26	27	28	29	30	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						
							2153							2014 August														
2469		20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	F		B				C	CCCB	CC		CC	CC	CMCC	CMM	CC	C		CCC			CCCC	C						CC
								2154										2014 September										
2470		16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11
	F	C		C		CCCC	CMCC	MCCC	CCCC	CMC	MM	C		CB	C	CCB	CCCC											