

DAY	Xray class	Observers	John Cook (23.4kHz/22.1kHz)	Roberto Battaiola (21.75kHz)	Andrew Lutley (23.4kHz)	Bob Middlefell (22.1kHz)	Mark Edwards (19.6/24.0/37.5kHz)
			Tuned radio frequency receiver, 0.58m frame aerial.	Modified AAVSO receiver.	Tuned radio frequency receiver, 0.5m frame aerial.	Tuned radio frequency receiver, 0.5m frame aerial.	Spectrum Lab / PC 2m loop aerial.
			START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	C1.5	2					09:50 10:00 10:09 1
1	?	1					10:30 10:41 11:06 2
1	C2.3	2	12:51 12:54 13:05 1-				12:50 12:54 13:29 2
1	C1.1	1					14:03 14:05 14:14 1-
1	C1.1	1					14:21 14:27 14:35 1-
1	?	1					15:41 15:45 15:59 1-
1	*	1					16:08 16:12 16:31 1
1	C1.8	1					18:44 18:48 19:07 1
1	*	1					19:42 19:47 19:55 1-
2	C1.5	2					13:08 13:32 14:07 2+
3	C2.8	2	05:57 06:02 06:12 1-				
3	*	1					12:21 12:22 12:52 1+
3	C1.4	3					16:18 16:29 16:53 2
3	C3.0	1					
4	C3.5	4	11:31 11:50 12:30 2+				11:29 11:49 13:36 3+
4	(C3.5)	1					12:41 13:06 ? -
4	(C3.5)	1					14:27 14:39 15:26 2+
6	C6.3	3					08:14 08:20 09:17 2+
6	C1.7	2					10:21 10:27 10:43 1
6	C1.6	3					11:33 11:42 12:00 1+
6	C2.3	6	14:05 14:10 14:24 1				14:05 14:09 14:45 2
6	C2.8	4					16:59 17:08 17:27 1+
7	C2.2	3	08:16 08:25 08:43 1+				08:16 08:21 08:34 1-
7	C1.5	3					10:25 10:30 10:50 1
7	C4.1	6	13:26 13:33 14:06 2				13:27 13:34 14:23 2+
7	C3.0	1					18:48 18:55 19:25 2
8	C4.9	6	11:20 11:35 12:12 2+				11:21 11:34 12:10 2+
8	C1.3	2					14:03 14:06 14:28 1
8	C1.5	3					14:44 14:47 15:05 1
8	C1.9	3					16:14 16:23 16:47 2
9	C3.2	1					
9	?	1					11:14 11:29 ? -
9	C8.4	6	11:36 11:52 12:51 2+				11:33 11:50 12:56 2+
9	C1.1	2					16:57 16:58 17:22 1
10	C4.2	1					
10	C2.7	2					17:37 17:42 18:35 2+
11	M1.0	7	11:59 12:20 13:18 2+				11:57 12:20 14:29 3+
11	C2.0	2					16:35 16:44 17:53 2+
13	C1.4	1					
13	C2.4	5	12:38 12:45 13:07 1+			12:38 12:43 13:03 1	12:37 12:46 13:31 2+
13	C2.8	2					
14	C1.1	3	11:34 11:44 11:56 1				11:34 11:39 11:51 1-
16	C3.6	7	12:46 13:18 13:47 2+				12:48 13:24 14:32 3
17	C4.7	7	08:32 08:40 09:10 2				08:35 08:39 08:49 1-
17	M2.4	9	13:16 13:21 13:45 1+			13:26 13:29 14:21 2+	13:17 13:21 14:23 2+
17	C1.3	2					15:26 15:33 16:06 2
17	C1.5	4					16:10 16:14 16:28 1-
17	M1.0	7	17:14 17:21 17:50 2				17:13 17:21 18:47 3
18	M1.8	1					
18	C6.1	4					06:14 06:23 06:58 2
18	C2.6	6	08:35 08:38 ? -				08:34 08:48 ? -
18	C1.9	4	10:30 10:40 ? -				08:53 09:04 09:40 2+
18	C1.0	3					09:54 09:59 10:18 1
18	C1.9	3					10:34 10:41 11:04 1+
18	C1.3	2					11:43 11:46 ? -
18	C2.4	5	11:51 11:55 12:23 1+				11:52 11:54 12:17 1
18	C1.0	1					12:25 12:28 12:47 1
18	C2.1	6	13:37 13:42 14:15 2				13:37 13:42 14:06 1+
18	C7.3	8	14:26 14:29 15:04 2				14:25 14:30 15:43 2+
18	M2.0	8	16:06 16:09 17:04 2+			14:30 14:33 14:54 1	16:05 16:09 17:13 2+
18	C2.5	1				16:10 16:14 16:54 2	19:11 19:16 19:49 2
29	C1.0	1					
30	C1.6	1					
30	*	1					
30	C7.6	6	09:10 09:14 09:43 2			09:11 09:14 09:51 2	09:10 09:15 09:51 2
30	M1.3	6	12:08 12:19 13:10 2+				12:05 12:13 13:06 2+
30	*	1					13:19 13:22 13:37 1-
31	C2.9	2					
31	C1.9	1					
31	C2.2	2					
31	C2.1	2					

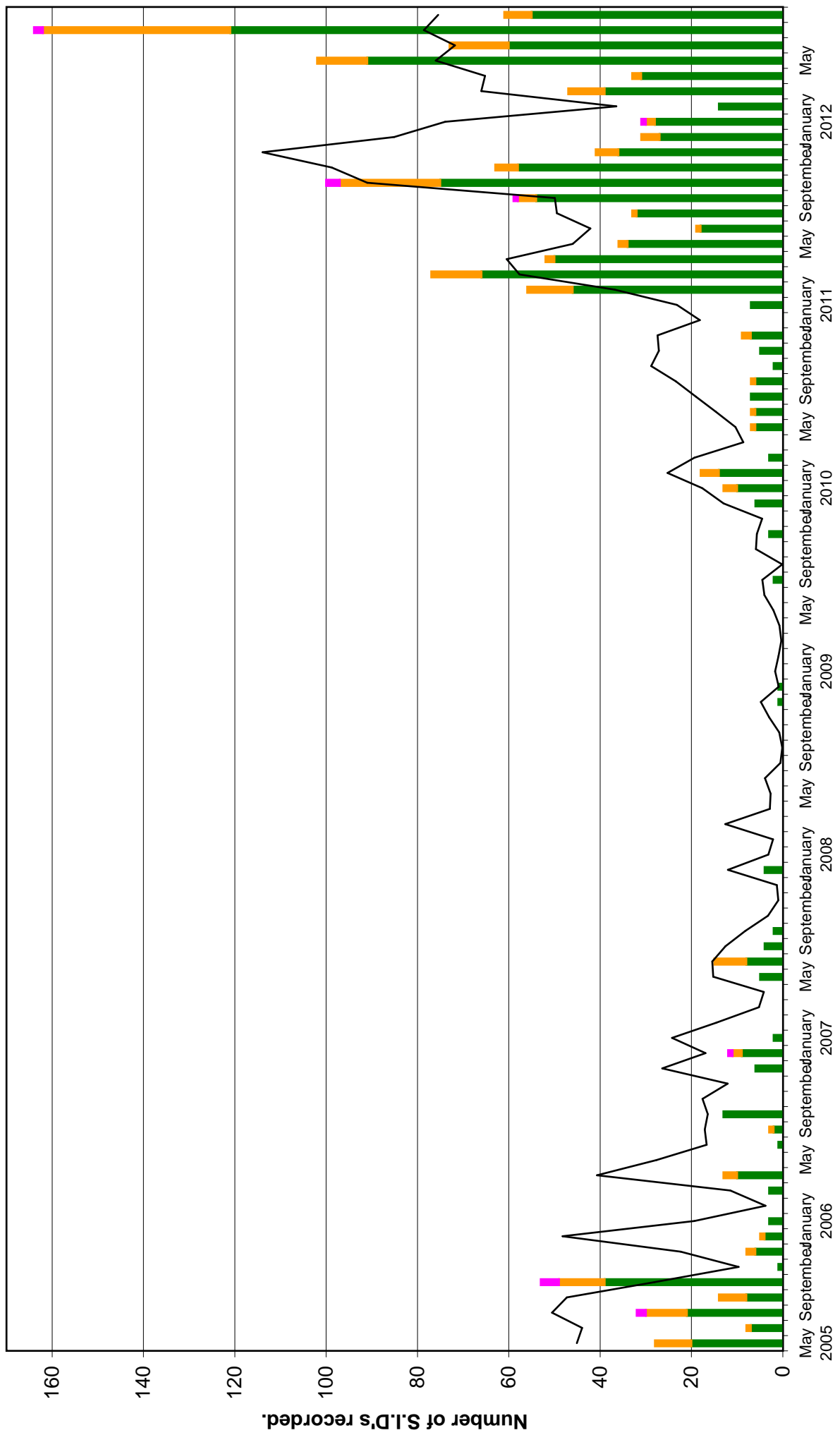
BAA Radio Astronomy Group.

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DAY		Colin Clements (22.1/23.4kHz)				Peter Meadows (23.4kHz)			Mike King (20.9kHz)			John Wardle (19.6/23.4kHz)			Peter King (18.3kHz)				
		AAVSO receiver, 0.76m screened loop aerial.				Tuned radio frequency receiver, 0.58m frame aerial.			AAVSO receiver. Tuned loop aerial.			PC soundcard, long wire aerial.			Own designed receiver, 1.4m loop aerial.				
		START	PEAK	END (UT)		START	PEAK	END (UT)	START	PEAK	END (UT)	START	PEAK	END (UT)	START	PEAK	END (UT)		
1	C1.5														09:45	09:50	10:05	1	
1	?																		
1	C2.3																		
1	C1.1																		
1	C1.1																		
1	?																		
1	*																		
1	C1.8																		
1	*																		
2	C1.5														12:15	13:10	13:35	2+	
3	C2.8																		
3	*																		
3	C1.4														16:05	16:30	16:50	2	
3	C3.0																		
4	C3.5														21:11	21:22	21:30	1	
4	(C3.5)																		
4	(C3.5)																		
6	C6.3											08:14	08:18	09:00	2+				
6	C1.7																		
6	C1.6														11:30	11:40	11:45	1-	
6	C2.3	14:03	14:09	14:46	2							14:06	14:11	14:25	1	14:00	14:08	14:14	1-
6	C2.8											16:59	17:05	17:24	1	16:50	16:57	17:03	1-
7	C2.2																		
7	C1.5														10:20	10:25	10:32	1-	
7	C4.1	13:23	13:36	14:20	2+							13:28	13:30	13:36	1-	13:23	13:30	13:35	1-
7	C3.0																		
8	C4.9	11:20	11:38	12:03	2							11:20	11:32	12:03	2	11:18	11:34	11:43	1
8	C1.3																		
8	C1.5														14:43	14:47	14:50	1-	
8	C1.9														16:10	16:22	16:30	1	
9	C3.2																		
9	?																		
9	C8.4	11:39	11:52	13:06	3										11:37	11:48	12:00	1	
9	C1.1														16:54	16:59	17:02	1-	
10	C4.2																		
10	C2.7														17:33	17:39	17:47	1-	
11	M1.0	11:58	12:27	15:26	3+							11:57	12:18	14:00	3	11:55	12:20	12:58	2+
11	C2.0														16:30	16:43	17:04	2	
13	C1.4														09:20	09:30	09:40	1	
13	C2.4														12:34	12:40	12:50	1-	
13	C2.8	12:39	12:47	13:17	2														
14	C1.1														11:30	11:38	11:44	1-	
16	C3.6	12:45	13:15	14:29	3							12:51	13:10	14:01	2+	12:40	13:16	13:50	2+
17	C4.7	08:34	08:41	09:51	2+							08:32	08:38	09:05	2	08:30	08:38	08:45	1-
17	M2.4	13:16	13:25	15:15	3							13:17	13:21	14:22	2+	13:13	13:20	13:25	1-
17	C1.3																		
17	C1.5	16:09	16:16	16:54	2										16:05	16:12	16:15	1-	
17	M1.0	17:13	17:18	18:04	2+							17:13	17:24	18:01	2+	17:10	17:21	17:28	1-
18	M1.8																		
18	C6.1											06:10	06:15	06:26	1-				
18	C2.6											09:20	09:23	09:30	1-	08:31	08:38	08:40	1-
18	C1.9																		
18	C1.0														09:46	09:54	10:09	1	
18	C1.9														10:33	10:38	10:40	1-	
18	C1.3																		
18	C2.4											11:59	12:03	12:11	1-	11:50	11:54	11:56	1-
18	C1.0																		
18	C2.1	13:35	13:42	13:58	1							13:37	13:41	14:02	1				
18	C7.3	14:26	14:31	16:06	3							14:25	14:30	14:57	1+	14:20	14:28	14:30	1-
18	M2.0	16:06	16:11	17:29	2+							16:03	16:08	17:00	2+				
18	C2.5																		
29	C1.0														13:43	13:54	14:02	1	
30	C1.6																		
30	*																		
30	C7.6														08:31	09:13	09:17	2+	
30	M1.3	12:08	12:14	12:56	2+														
30	*																		
31	C2.9																		
31	C1.9														09:05	10:05	10:20	2+	
31	C2.2														14:08	14:15	14:25	1-	
31	C2.1														16:05	16:13	16:24	1	

		Steve Parkinson (23.4/22.1/19.6kHz)	Simon Dawes (various)	Gonzalo Vargas (Various)	Tarif Rashid Santo (19.8kHz)	
		Tuned radio frequency receiver, frame aeriels.	PC soundcard and TRF receiver with 1m loop aerial.	Spectrum Lab.	Spectrum Lab, 15m Half-wave dipole.	
DAY		START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	C1.5					
1	?					
1	C2.3					
1	C1.1					
1	C1.1					
1	?					
1	*					
1	C1.8					
1	*					
2	C1.5					
3	C2.8					
3	-					
3	C1.4					
3	C3.0					
4	C3.5					
4	(C3.5)					
4	(C3.5)					
6	C6.3					
6	C1.7					
6	C1.6					
6	C2.3					
6	C2.8					
7	C2.2					
7	C1.5					
7	C4.1					
7	C3.0					
8	C4.9					
8	C1.3					
8	C1.5					
8	C1.9					
9	C3.2					
9	?					
9	C8.4	11:43 11:51 12:30 2+				
9	C1.1				04:10 04:24 05:00 2+	
10	C4.2					
10	C2.7					
11	M1.0	12:00 12:24 13:47 3				
11	C2.0					
13	C1.4					
13	C2.4	12:38 12:46 13:10 1+				
13	C2.8					
14	C1.1					
16	C3.6	12:50 13:13 14:12 2+				
17	C4.7	08:34 08:39 09:36 2+				
17	M2.4	13:17 13:21 14:16 2+				
17	C1.3					
17	C1.5					
17	M1.0	17:16 17:23 17:57 2				
18	M1.8				03:21 03:24 04:14 2+	
18	C6.1				06:12 06:24 07:24 2+	
18	C2.6	08:35 08:40 ? -				
18	C1.9	08:54 09:00 ? -				
18	C1.0					
18	C1.9					
18	C1.3					
18	C2.4					
18	C1.0					
18	C2.1	13:37 13:41 13:52 1-				
18	C7.3	14:25 14:30 14:53 1+				
18	M2.0	16:06 16:09 16:57 2+				
18	C2.5					
29	C1.0					
30	C1.6					
30	*					
30	C7.6	09:11 09:14 09:40 1+				
30	M1.3	12:09 12:15 13:00 2+				
30	*					
31	C2.9				07:20 07:30 08:00 2	
31	C1.9					
31	C2.2					
31	C2.1					

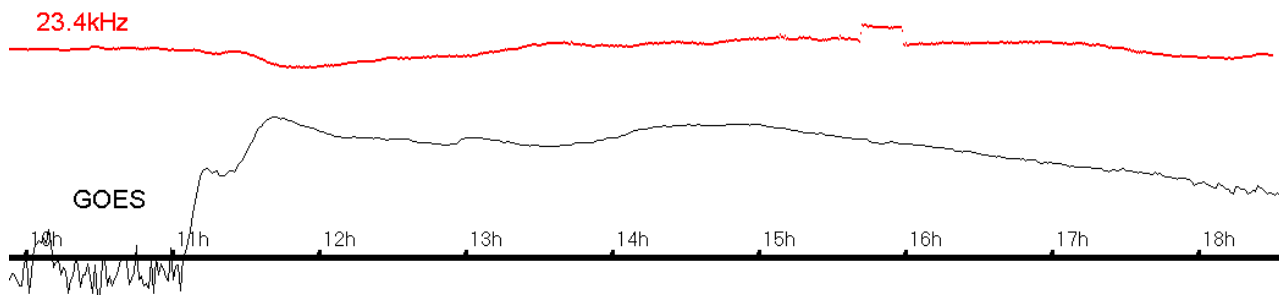
VLF flare activity 2005/12.



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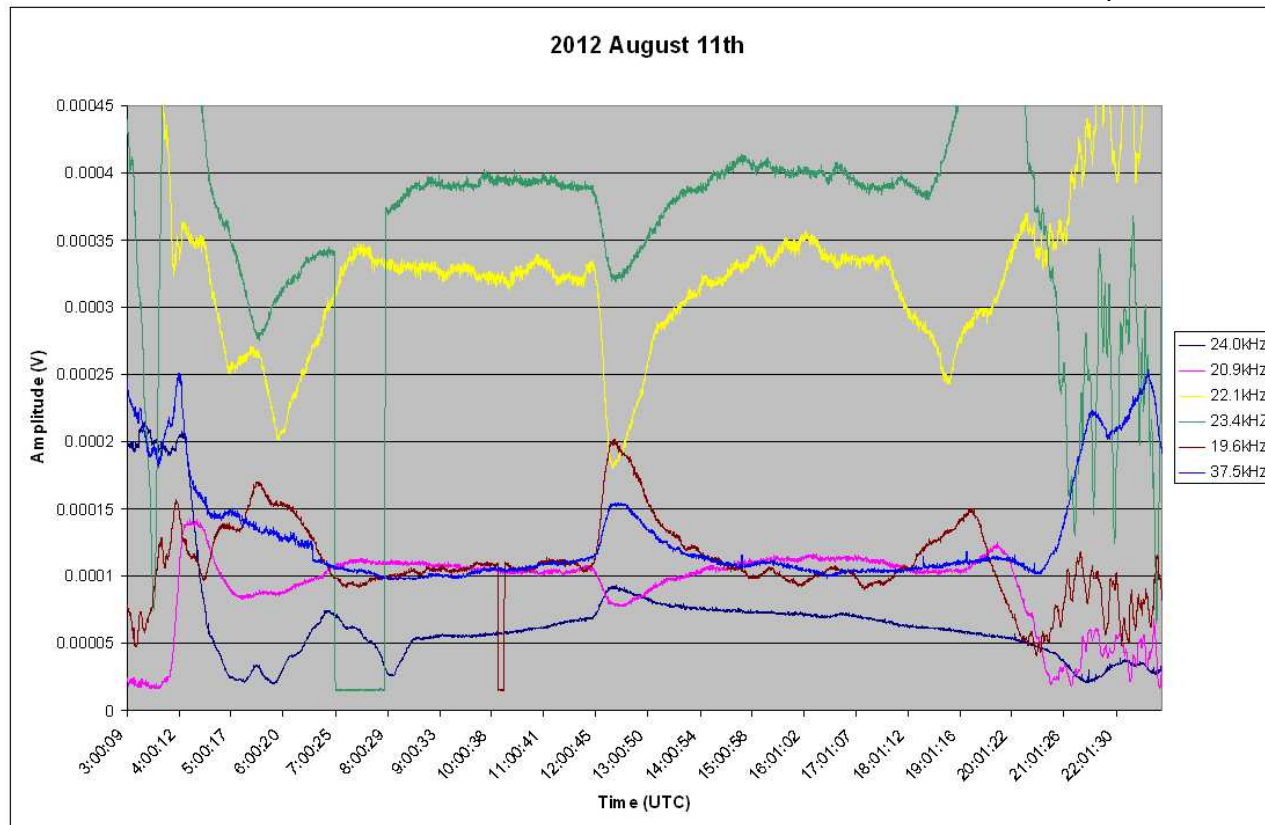
After the high peak in July, activity in August was much lower. There were no X-class flares, and we recorded SIDs from just 6 M-class and 55 C-class flares. A very slow C3.5 flare on the 4th caused some difficulties in SID analysis. SWPC lists the X-ray flare starting at 11:04, peaking at 15:00 and ending at 16:49UT. This was from active region 1539 as it decayed down to a single spot.

2012 August 4



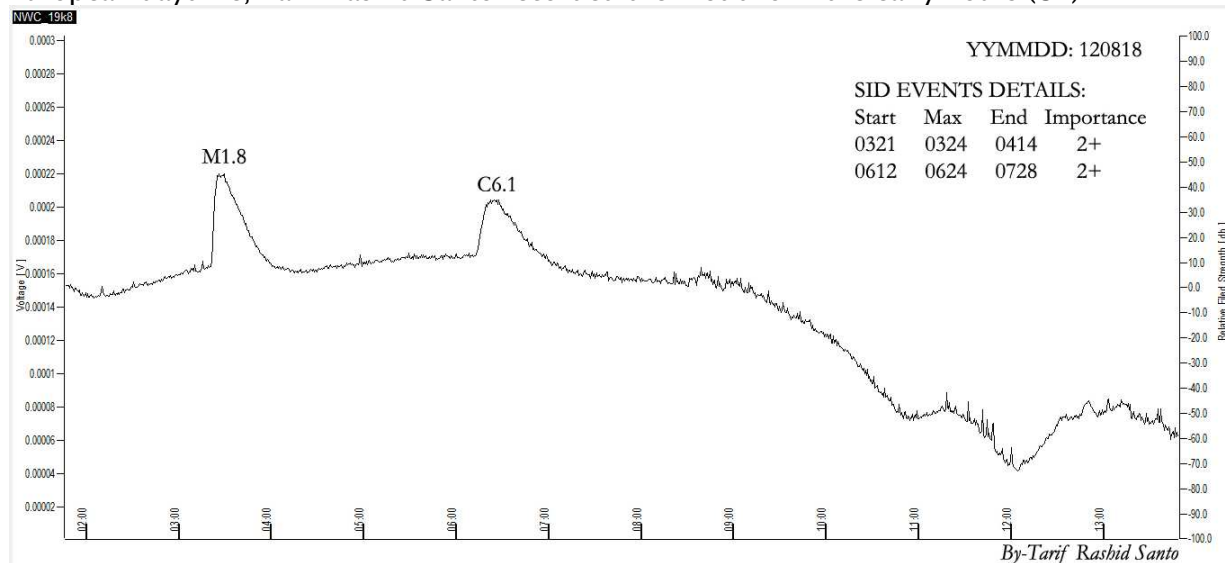
This is my own recording at 23.4kHz in red, with the GOES X-ray flux added in black. Although the initial rise is fairly rapid, it then shows four peaks before decaying through the rest of the day. I have added all of the timings received from observers in the table. The small rise in the 23.4kHz signal around 16UT is due to the transmitter.

The first of the M-class flares was on the 11th. Mark Edwards recorded this at six frequencies:



This M1.0 flare produced a much more recognisable SID. The later C2.0 flare is just visible in the 24kHz trace (dark blue). Mark also noted the recurrence of regular oscillations on the 10th and 12th.

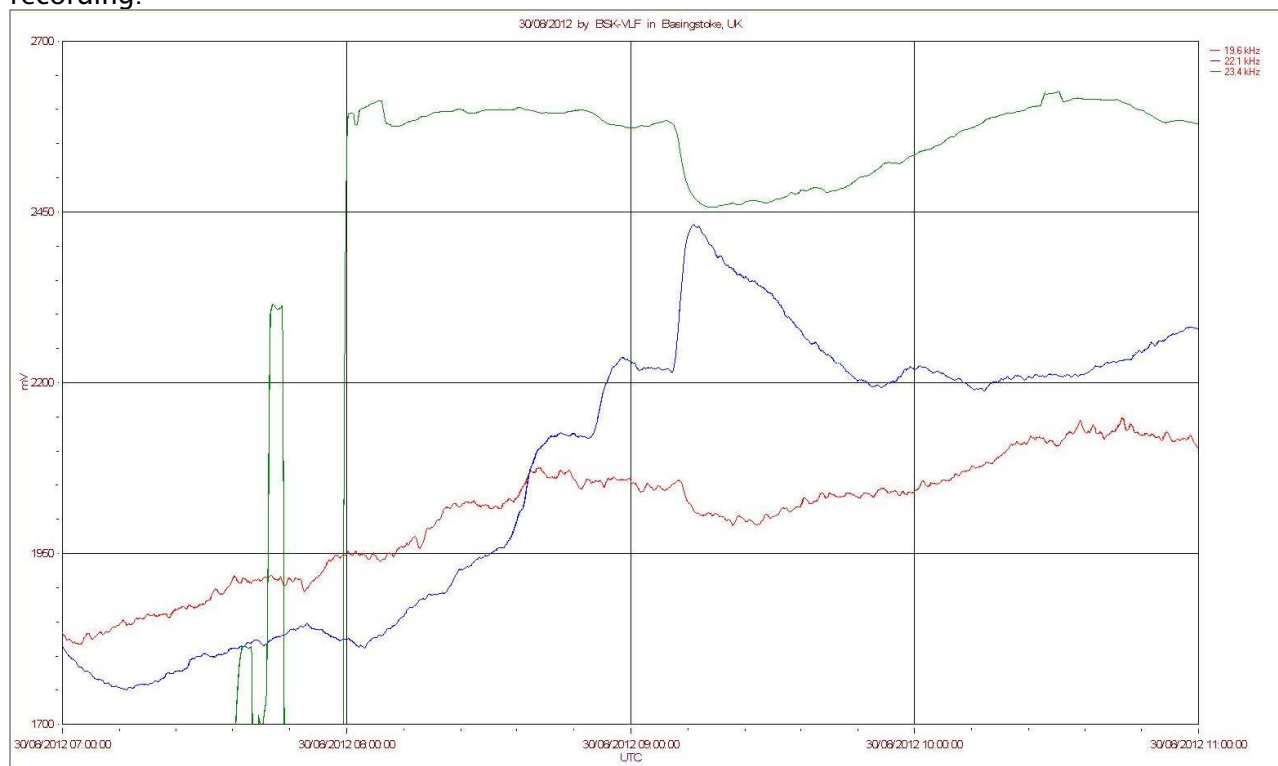
Activity peaked on the 18th with a total of 13 SID events recorded. Although most of these were during European daytime, Tarif Rashid Santo recorded the first two in the early hours (UT):



The C6.1 peaking at 06:24 was also recorded from the UK, although I do not have a chart that shows it clearly.

Nothing was recorded from the 19th to the 28th. The SWPC list only a few B-class flares during this time.

A series of SIDs early on the 30th were again difficult to interpret. SWPC list only the C1.6 and C7.6 flares shown in the table, while the GOES data shows extra peaks. Paul Hyde included this recording:

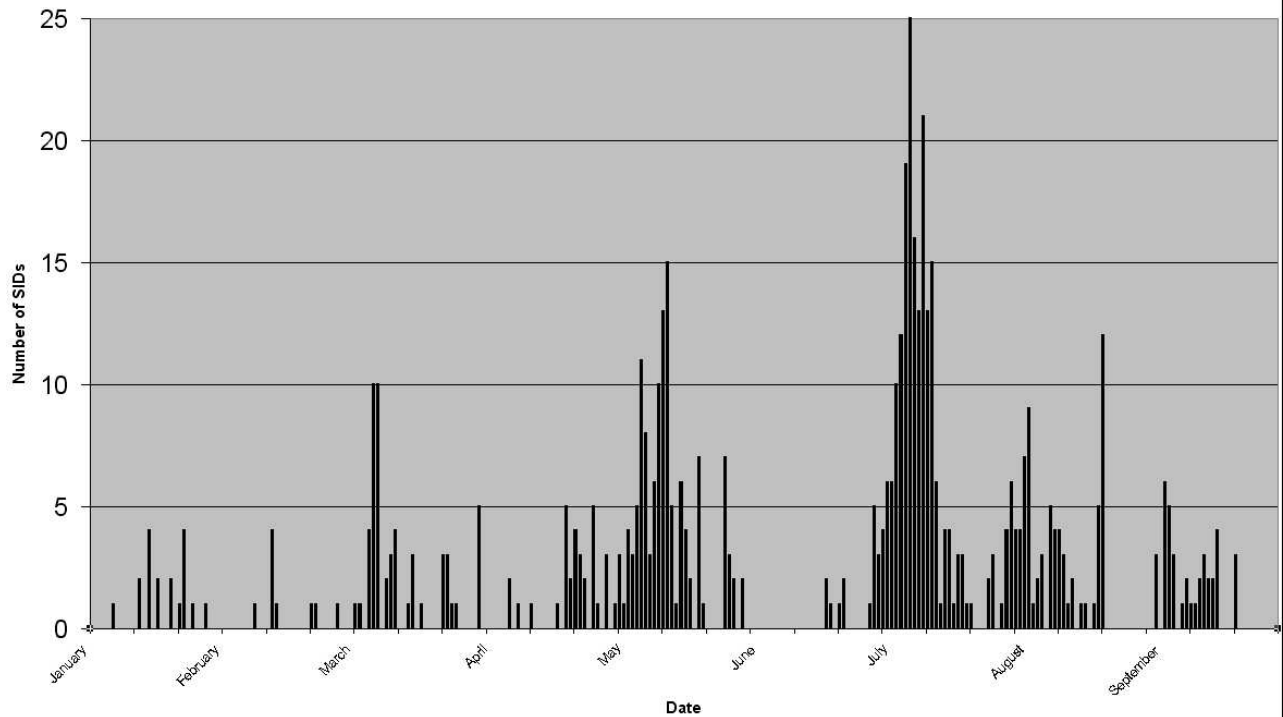


The 22.1kHz trace (blue) clearly shows three peaks.

Mark Edwards has also provided a chart of his own daily SID numbers. The activity chart that I produce from your observations shows how the monthly SID numbers compare with visual

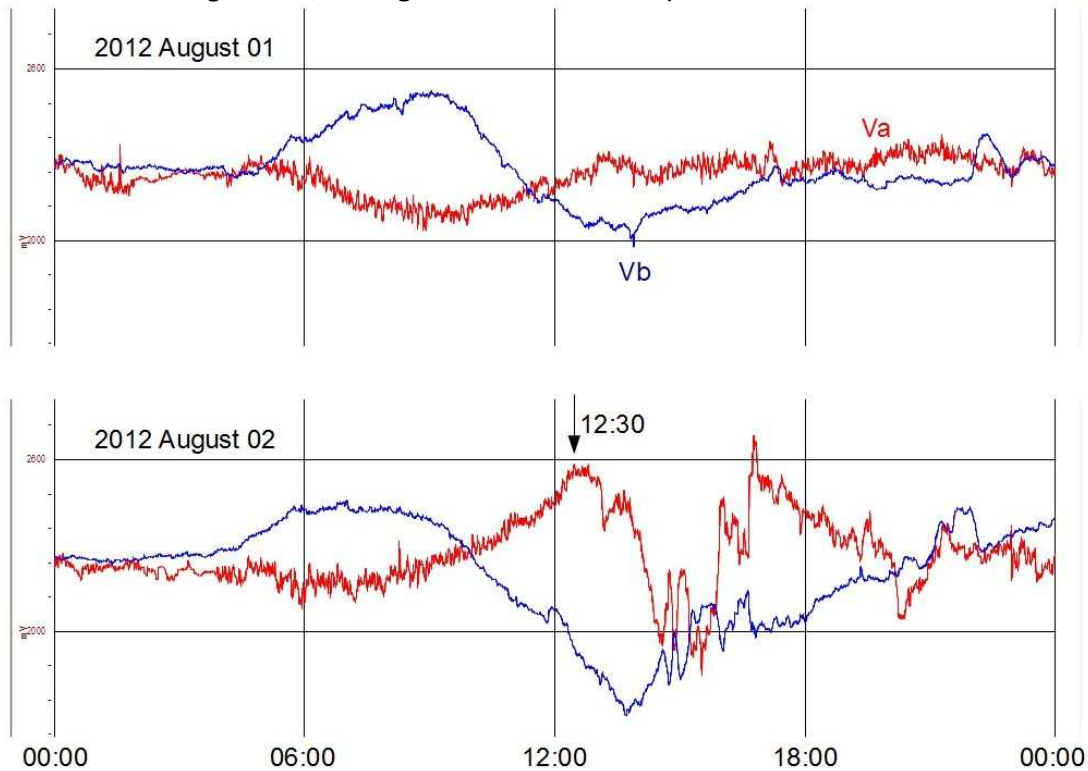
activity, while Mark's chart shows activity varying over the 27 day solar rotation period. There also seems to be a strong cycle present at about twice the solar rotation period.

SID Daily Numbers 2012



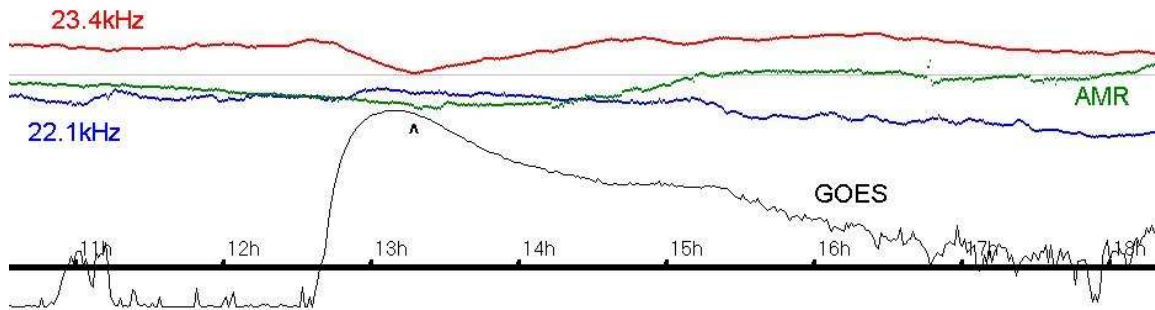
Magnetic Data.

The M6.1 flare on July 28th (see last month's summary) produced a CME which caused a magnetic disturbance on August 2nd, lasting into the 3rd. Paul Hyde recorded the disturbance:

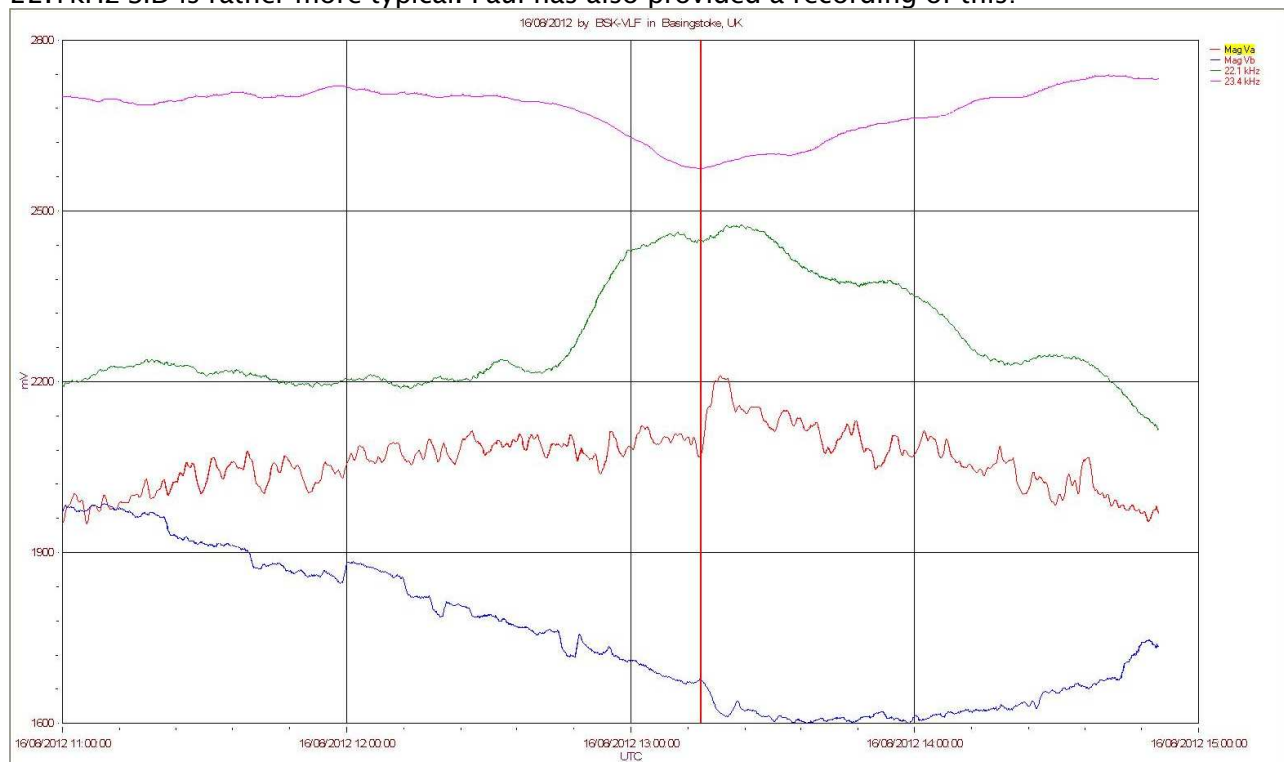


Using August 1st as a quiet reference, Paul has noted the major disturbance starting at about 12:30UT. The SID peak at 20:56 (on the 28th) matches the SWPC timing, giving a CME transit time of over 111 hours.

The BGS Hartland observatory lists a SFE peaking at 13:19UT on the 16th. This is nearly co-incident with the C3.6 flare recorded at that time. Examining the X-ray profile, this looks to be a most unusual candidate for causing a SFE. Previous examples have been associated with very fast energetic M or X-class flares. My recording has the GOES X-ray data added:



The SFE is quite small, and is marked by 'A'. The 23.4kHz SID is very slow to start, although the 22.1 kHz SID is rather more typical. Paul has also provided a recording of this:



The magnetometer is in red and blue, green being 22.1 kHz and magenta 23.4 kHz. An alternative explanation for our recording would be that the magnetic disturbance is from a weak CME. The C2.4 flare on the 13th is a suggested candidate, but the true origin of this disturbance remains unknown at the moment.

If you are able to get to our meeting at the National Space Centre in Leicester on October 27th, I would be pleased to have a chat and discuss observations. Tickets are £12 for BAA members (£15 non-members) and are obtainable through the BAA office. A buffet lunch, afternoon tea, car parking and NSC access are all included.

ROTATION	KEY:	DISTURBED.	ACTIVE	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).
2407	F	18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3	2010 January	2092	4 5 6 7 8 9 10 11 12 13
2408	F	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 8 9	2010 February	2093	1 2 3 4 5 6 7 8 9
2409	F	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	1 2 3 4 5 6 7 8	2010 March	2094	1 2 3 4 5 6 7 8
2410	F	9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	1 2 3 4 5 6 7 8 9	2010 April	2095	1 2 3 4
2411	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	1 2 3 4 5 6 7 8 9	2010 May	2096	1
2412	F	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	1 2 3 4 5 6 7 8 9	2010 June	2097	1 2 3 4 5 6 7 8 9
2413	F	29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	1 2 3 4 5 6 7 8 9	2010 July	2098	1 2 3 4 5 6 7 8 9
2414	F	25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13	1 2 3 4 5 6 7 8 9	2010 August	2099	1 2 3 4 5 6 7 8 9
2415	F	22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9	2010 September	2100	1 2 3 4 5 6 7 8 9
2416	F	19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6	1 2 3 4 5 6 7 8 9	2010 October	2101	1 2 3 4 5 6 7 8 9
2417	F	15 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	2010 November	2102	1 2 3 4 5 6 7 8 9
2418	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9	2010 December	2103	1 2 3 4 5 6 7
2419	F	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	1 2 3 4 5 6 7 8 9	2104	2105	1 2 3 4
2420	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	1 2 3 4 5 6 7 8 9	2106	2107	1 2 3 4 5 6 7 8 9
2421	F	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	1 2 3 4 5 6 7 8 9	2108	2109	1 2 3 4 5 6 7 8 9
2422	F	28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17	1 2 3 4 5 6 7 8 9	2110	2111	1 2 3 4 5 6 7 8 9
2423	F	24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	1 2 3 4 5 6 7 8 9	2112	2113	1 2 3 4 5 6 7 8 9
2424	F	23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11	1 2 3 4 5 6 7 8 9	2114	2115	1 2 3 4 5 6 7 8 9
2425	F	19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8 9	2116	2117	1 2 3 4 5 6 7 8 9
2426	F	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4	1 2 3 4 5 6 7 8 9	2118	2119	1 2 3 4 5 6 7 8 9
2427	F	12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9	2120	2121	1 2 3 4 5 6 7 8 9
2428	F	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 7 8 9	2122	2123	1 2 3 4 5 6 7 8 9
2429	F	5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	1 2 3 4 5 6 7 8 9	2124	2125	1 2 3 4 5 6 7 8 9
2430	F	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 27	1 2 3 4 5 6 7 8 9	2126	2127	1 2 3 4 5 6 7 8 9
2431	F	28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	1 2 3 4 5 6 7 8 9	2128	2129	1 2 3 4 5 6 7 8 9
2432	F	25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	1 2 3 4 5 6 7 8 9	2130	2131	1 2 3 4 5 6 7 8 9
2433	F	21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13	1 2 3 4 5 6 7 8 9	2132	2133	1 2 3 4 5 6 7 8 9
2434	F	18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9	2134	2135	1 2 3 4 5 6 7 8 9
2435	F	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 8 9	1 2 3 4 5 6 7 8 9	2136	2137	1 2 3 4 5 6 7 8 9
2436	F	10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	1 2 3 4 5 6 7 8 9	2138	2139	1 2 3 4 5 6 7 8 9
2437	F	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 3 4 5 6 7 8 9	2140	2141	1 2 3
2438	F	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 30	1 2 3 4 5 6 7 8 9	2142	2143	1 2 3 4 5 6 7 8 9
2439	F	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 27	1 2 3 4 5 6 7 8 9	2144	2145	1 2 3 4 5 6 7 8 9
2440	F	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 23	1 2 3 4 5 6 7 8 9	2146	2147	1 2 3 4 5 6 7 8 9
2441	F	24 25 26 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	1 2 3 4 5 6 7 8 9	2148	2149	1 2 3 4 5 6 7 8 9
2442	F	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 16	1 2 3 4 5 6 7 8 9	2150	2151	1 2 3 4 5 6 7 8 9
2443	F	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 12	1 2 3 4 5 6 7 8 9	2152	2153	1 2 3 4 5 6 7 8 9