BAA Radio Astronomy Group. **2014 OCTOBER**

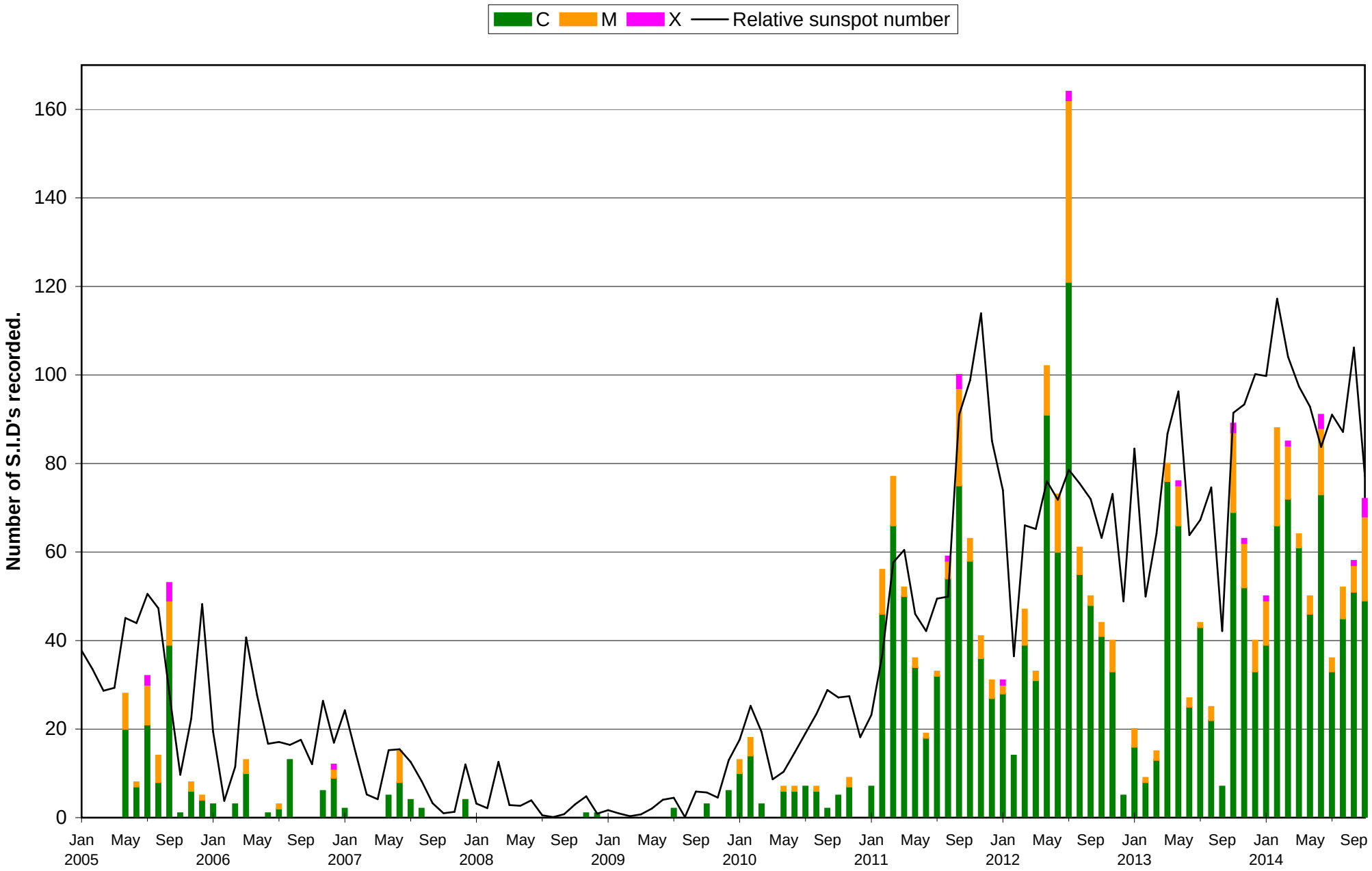
			John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola (20.9kHz)				Paul Hyde (22.1/23.4kHz)				Bob Middlefell (22.1kHz)				Mark Edwards (**20.9**/24.0/*19.6kHz*)			
	X-ray class	Observers	Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Tuned radio frequency receiver, 0.96m 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	*	3	*13:00*	*13:03*	*13:14*	*1-*													12:59	13:06	?	-
1	*	1																	13:39	13:52	14:06	1+
1	*	1																	14:43	14:55	15:06	1
2	?	1																	*12:43*	*12:55*	*13:05*	*1*
2	?	1																	12:46	13:12	13:51	2+
2	**M1.5**	1																	17:14	17:45	18:31	2+
2	**M7.3**	1																	18:55	18:58	19:05	1-
3	C9.0	1					06:39	07:00	07:30	2+												
3	C2.2	5	*10:44*	*10:49*	*10:58*	*1-*	10:42	10:50	10:56	1-	10:44	10:49	11:11	1+					10:44	10:50	10:59	1-
3	C2.5	5	*11:43*	*11:48*	*12:01*	*1-*	11:41	11:50	12:06	1	11:43	11:49	12:39	2+					11:43	11:51	?	-
3	?	1																	12:01	12:07	12:34	2
6	?	1																	*13:13*	*13:16*	*13:21*	*1-*
8	C2.1	1																	16:49	16:52	17:09	1
9	**M1.2**	2					06:49	07:02	07:20	1+									*06:55*	*07:03*	*07:16*	*1*
9	C2.7	1																	*07:41*	*07:45*	*07:52*	*1-*
9	*	2	*08:43*	*08:45*	*08:53*	*1-*													*08:42*	*08:47*	*08:53*	*1-*
9	C7.9	5	09:25	09:28	10:15	2+	09:20	09:27	09:32	1-									*09:25*	*09:33*	*10:23*	*2+*
9	*	3																	11:01	11:04	11:11	1-
9	C1.9	1																				
16	C7.7	4	*07:34*	*07:38*	*08:00*	*1+*	07:31	07:39	08:15	2	07:30	07:36	?	-					*07:33*	*07:36*	*07:50*	*1-*
16	C6.4	5	08:49	08:56	?	-	08:38	08:53	09:34	2+	08:44	08:55	09:52	2+					*08:46*	*08:54*	*09:07*	*1*
16	?	1																				
16	?	2	09:11	09:15	09:50	2													12:17	12:18	12:24	1-
16	?	1																	**12:40**	**12:48**	**12:56**	**1-**
16	**M4.3**	5	13:01	13:05	14:14	2+					13:01	13:03	14:10	2+					13:01	13:05	14:28	3
17	C3.6	5	12:46	12:51	13:31	2					12:44	12:52	13:43	2+					12:46	12:52	13:22	2
17	C6.7	6	*15:38*	*15:40*	*15:48*	*1-*	15:37	15:41	15:56	1	15:37	15:41	16:12	2					15:37	15:40	?	-
17	?	1																	15:58	16:02	16:42	2
18	**M1.6**	2	*07:29*	*07:42*	*07:57*	*1+*	07:06	07:48	08:05	2+												
18	?	1																	*09:23*	*09:26*	*09:31*	*1-*
18	?	1																	13:05	13:06	13:09	1-
18	C2.6	5	13:14	13:18	?	-	13:13	13:20	13:29	1-	13:12	13:18	13:49	2					13:13	13:18	13:38	1
18	?	1																	14:08	14:11	14:17	1-
18	C1.7	1																	14:25	14:26	14:30	1-
18	C2.6	2	15:54	16:01	?	-													16:02	16:06	16:19	1-
19	?	2																	11:09	11:11	11:14	1-
19	C4.2	6	11:16	11:21	?	-	11:11	11:20	11:38	1+	11:07	11:21	?	-					11:16	11:21	11:40	1
19	C5.8	6	12:11	12:16	13:24	2+	12:11	12:14	12:20	1-	12:11	12:17	14:18	3+					12:11	12:18	12:56	2
19	?	2																	14:27	14:42	14:57	1+
19	C3.9	3	*15:52*	*15:56*	*16:16*	*1*	15:49	15:54	15:57	1-									15:53	15:58	16:24	1+
19	C4.7	1																	17:33	17:35	17:41	1-
20	**M3.9**	6	09:05	09:13	10:21	2+	09:00	09:14	09:48	2+	09:02	09:12	10:12	2+					09:05	09:10	09:44	2
20	?	2	10:31	10:36	10:48	1-													*10:34*	*10:39*	*11:01*	*1+*
20	*	1																	**10:49**	**10:53**	**11:05**	**1-**
20	C2.8	5	11:22	11:28	11:49	1+					11:22	11:29	12:26	2+					11:23	11:28	11:47	1
20	C8.6	1	*15:00*	*15:20*	*15:43*	*2*																
20	**M4.5**	4	*16:07*	*16:15*	*17:00*	*2+*	15:42	16:08	16:15	2									*16:06*	*16:15*	*16:40*	*2*
20	?	1																	***16:29***	***16:33***	***16:43***	***1-***
20	C6.2	1																	18:46	18:48	18:54	1-
20	**M1.4**	1																	18:58	19:02	19:09	1-
21	C3.1	1	08:09	08:12	08:26	1-																
21	?	2	10:29	10:31	?	-													10:31	10:33	10:36	1-
21	C6.3	5	10:47	11:00	11:38	2+	10:49	10:57	11:14	1	10:49	11:00	?	-					10:51	11:02	11:17	1+
21	C4.4	4	12:25	12:29	12:46	1					12:26	12:30	13:04	2					12:27	12:30	12:45	1-
21	?	1																	13:19	13:23	13:34	1-
21	**M1.2**	5	13:35	13:38	14:15	2	13:38	13:40	13:48	1-	13:37	13:40	14:20	2					13:37	13:40	14:03	1+
21	?	1																	14:19	14:33	?	-
21	?	1																	14:49	14:56	15:29	2
22	C4.6	5	09:09	09:14	?	-	09:09	09:14	09:24	1-	09:08	09:14	09:52	2					09:10	09:12	09:18	1-
22	?	2	09:27	09:33	09:50	1													**09:28**	**09:34**	**09:50**	**1**
22	C3.2	5	12:02	12:07	12:30	1+					12:02	12:09	12:48	2+					12:01	12:07	12:20	1
22	**X1.6**	6	14:04	14:25	?	-	14:06	14:13	15:12	2+	14:04	14:09	16:14	3+					14:04	14:12	15:50	3
22	**M1.4**	3					15:55	15:59	16:01	1-									15:52	15:58	16:21	1+
22	C5.7	1																	16:54	17:00	17:09	1-
22	?	1																	18:15	18:17	18:20	1-
23	**M1.1**	6	09:47	09:52	10:51	2+	09:48	09:50	09:54	1-	09:46	09:52	10:48	2+					09:47	09:51	09:58	1-
23	?	1																	13:35	13:39	13:48	1-
23	C4.6	2	15:21	15:36	15:54	2													15:22	15:37	16:10	2+
23	C5.9	1																	17:54	18:01	18:12	1-
24	**M4.0**	4	07:40	07:42	07:50	1-	07:40	07:44	07:51	1-	07:39	07:42	08:30	2+					*07:39*	*07:50*	*08:12*	*2*
24	C3.6	2									10:00	10:03	10:18	1-					***10:01***	***10:03***	***10:12***	***1-***
24	C5.1	3	*14:50*	*14:58*	*15:16*	*1+*													14:50	15:01	?	-
24	?	1																	15:20	15:22	15:39	1
24	?	1																	15:47	15:48	15:55	1-
25	C9.2	1																	***08:01***	***08:06***	***08:14***	***1-***
25	?	1																	*09:11*	*09:16*	*09:19*	*1-*
25	C4.6	6	09:45	09:50	10:00	1-	09:45	09:52	09:59	1-	09:41	09:51	10:14	2					*09:41*	*09:53*	*10:01*	*1*
25	C3.2	5	*12:15*	*12:21*	*12:37*	*1*					12:15	12:21	13:02	2+					12:16	12:22	?	-
25	?	1																	12:30	12:34	?	-
25	?	1																	12:37	12:40	12:47	1-
25	?	1																	14:01	14:06	?	-
25	?	1																	14:13	14:17	14:23	1-
25	?	1																	14:30	14:34	14:43	1-
25	C5.1	6	15:02	15:05	15:16	1-	15:00	15:09	15:19	1	15:02	15:06	15:26	1					14:59	15:06	15:23	1
25	C9.7	6	15:47	15:53	16:04	1-	15:49	15:54	16:01	1-	15:48	15:51	16:09	1					15:47	15:54	16:27	2
25	**X1.0**	1																	16:36	17:07	18:17	3

26	*	1														**09:18**	**09:21**	**09:26**	**1-**
26	?	1														***09:28***	***09:31***	***09:29***	***1-***
26	?	1														**09:43**	**09:45**	**09:48**	**1-**
26	?	2														**09:53**	**09:55**	**10:01**	**1-**
26	?	2														*10:05*	*10:07*	*10:09*	*1-*
26	?	4	10:15	10:20	10:32	1-										10:15	10:19	10:29	1-
26	**X2.0**	6	10:36	10:55	?	-	10:07	10:56	11:50	3	10:05	10:54	12:50	3+		10:37	10:58	11:52	2+
26	?	4	12:11	12:17	?	-										12:11	12:17	?	-
26	?	4	12:29	12:32	12:43	1-										12:29	12:33	12:42	1-
26	C9.2	6	13:05	13:11	13:30	1	13:08	13:10	13:11	1-	13:05	13:10	13:43	2		13:05	13:10	?	-
26	?	1														13:28	13:31	13:47	1
26	?	3														14:06	14:13	14:33	1+
26	?	2														14:43	14:47	14:58	1-
26	C5.2	6	15:10	15:17	15:30	1	15:11	15:20	15:34	1	15:10	15:18	?	-		15:13	15:20	15:43	1+
26	C3.5	1														15:53	15:59	16:04	1-
26	C5.3	1														16:16	16:19	16:26	1-
26	**M1.0**	2					17:07	17:19	17:25	1-						17:12	17:17	17:30	1-
27	C9.6	2					06:59	07:04	07:10	1-						***06:58***	***07:03***	***07:11***	***1-***
27	C9.6	2					07:14	07:19	07:26	1-						*07:13*	*17:18*	*07:20*	*1-*
27	?	2					07:32	07:36	07:41	1-						*07:31*	*07:37*	*07:42*	*1-*
27	?	1														*07:55*	*08:00*	*?*	-
27	?	2														*08:02*	*08:03*	*08:07*	*1-*
27	?	1														*08:12*	*08:19*	*08:24*	*1-*
27	?	3														08:57	09:06	09:28	1+
27	?	3					09:21	09:41	09:46	1						*09:19*	*09:37*	*?*	-
27	**M6.7**	6	08:57	10:09	13:22	3+	09:53	10:04	11:00	2+	10:01	10:09	?	-		09:59	10:17	10:57	2+
27	?	4					11:14	11:25	11:55	2						*11:12*	*11:25*	*?*	-
27	?	2														*11:59*	*12:08*	*?*	-
27	?	1														*12:13*	*12:16*	*13:10*	*2+*
27	?	1														*13:16*	*13:24*	*13:39*	*1*
27	**X2.0**	6	14:13	14:32	15:58	3	14:17	14:24	15:22	2+	14:09	14:23	?	-		*14:09*	*14:41*	*15:45*	*3*
28	C6.5	4	08:20	08:25	08:36	1-	08:20	08:24	08:29	1-	08:23	08:25	08:39	1-		**08:22**	**08:23**	**08:27**	**1-**
28	*	3	09:37	09:39	09:45	1-					09:39	09:41	09:53	1-		**09:39**	**09:40**	**09:48**	**1-**
28	*	2	10:23	10:24	10:50	1+										**10:24**	**10:30**	**10:47**	**1**
28	C5.3	6	11:03	11:06	11:21	1-	11:03	11:06	11:10	1-	11:05	11:09	11:25	1		11:05	11:09	11:23	1-
28	*	4	11:30	11:35	11:43	1-										11:33	11:38	11:50	1-
28	*	1														***12:28***	***12:29***	***12:30***	***1-***
28	*	3	12:45	12:50	12:59	1-										12:49	12:54	13:00	1-
28	?	2	13:04	13:10	13:28	1										13:07	13:17	?	-
28	*	3	13:34	13:36	13:41	1-										13:34	13:37	13:54	1
28	**M1.6**	5	13:53	14:03	14:29	2					13:56	14:03	14:47	2+		13:56	14:04	?	-
28	?	2					15:17	15:20	15:23	1-						15:17	15:21	15:35	1-
28	*	1														15:46	15:51	?	-
28	*	1														16:08	16:22	16:33	1
29	**M1.0**	3	08:13	08:18	08:31	1-					08:15	08:21	08:51	2		***08:16***	***08:22***	***08:35***	***1***
29	**M1.2**	5	09:55	10:02	?	-					09:56	10:02	11:56	3		*09:56*	*10:02*	*?*	-
29	?	3	10:16	10:22	10:57	2										*10:15*	*10:23*	*?*	-
29	?	1														*10:58*	*11:02*	*11:19*	*1*
29	?	4	11:33	11:38	12:02	1+										11:34	11:38	11:49	1-
29	?	1														**12:17**	**12:24**	**13:10**	**2+**
29	?	1														13:13	13:14	?	-
29	?	1														13:21	13:26	13:35	1-
29	?	1														13:40	13:47	13:55	1-
29	?	1														*13:48*	*13:50*	*13:53*	*1-*
29	C5.5	5	13:57	14:01	14:06	1-					13:58	14:01	?	-		13:58	14:01	?	-
29	?	2														14:09	14:22	?	-
29	**M1.4**	6	14:18	14:35	14:58	2	14:23	14:36	14:49	1+	14:22	14:25	15:29	2+		14:25	14:36	15:21	2+
29	?	1														16:08	16:15	?	-
29	**M1.0**	3									16:09	16:16	?	-		16:17	16:19	16:51	2
29	?	1														17:09	17:11	17:13	1-
30	?	1														**10:34**	**10:36**	**10:41**	**1-**
30	?	1														**12:13**	**12:16**	**12:18**	**1-**
30	C2.9	5	12:39	12:44	12:58	1					12:40	12:45	13:03	1		12:42	12:46	13:01	1
30	C6.9	5	13:07	13:14	13:31	1					13:07	13:14	13:44	2		13:08	13:15	13:38	1+
30	*	1														14:00	14:04	14:11	1-
30	?	1														14:29	14:31	14:32	1-
30	C2.3	1														15:09	15:10	15:14	1-
30	?	1														15:22	15:34	?	-
30	C9.7	5	15:24	15:33	16:10	2+	15:21	15:41	16:00	2	15:26	15:33	?	-		15:40	15:44	16:16	2

BAA Radio Astronomy Group. **2014 OCTOBER**

			Colin Clements (23.4kHz/*22.1kHz*)				Steve Parkinson (Various)				Richard Kaye (Various)				John Wardle (19.6/23.4kHz)				Gordon Fiander (19.6/22.1kHz)			
			AAVSO receiver, 0.76m screened loop aerial.				Tuned radio frequency receivers, frame aerials.				Pre-amplifier + PC software receiver.				PC soundcard, 0.7m frame aerial.				PC sound card.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	*						12:55	13:05	13:30	2												
1	*																					
1	*																					
2	?																					
2	?																					
2	**M1.5**																					
2	**M7.3**																					
3	C9.0																					
3	C2.2						10:44	10:50	11:00	1-												
3	C2.5						11:43	11:50	12:20	2												
3	?																					
6	?																					
8	C2.1																					
9	**M1.2**																					
9	C2.7																					
9	*																					
9	C7.9		09:21	09:32	10:43	2+	09:22	09:30	10:10	2+												
9	*		10:55	11:09	11:27	1+	11:03	11:08	11:30	1+												
9	C1.9						12:55	13:06	13:25	1+												
16	C7.7																					
16	C6.4						08:46	08:54	?	-												
16	?						09:11	09:22	09:40	1+												
16	?																					
16	?																					
16	**M4.3**		13:00	13:06	14:07	2+	12:01	13:04	14:00	3												
17	C3.6		12:43	12:53	14:13	3	12:46	12:51	13:20	2												
17	C6.7		15:37	15:42	15:51	1-	15:38	15:41	15:55	1-												
17	?																					
18	**M1.6**																					
18	?																					
18	?																					
18	C2.6						13:14	13:18	13:22	1-												
18	?																					
18	C1.7																					
18	C2.6																					
19	?						11:08	?	?	-												
19	C4.2		11:15	11:20	12:10	2+	11:55	11:22	?	-												
19	C5.8		12:10	12:18	13:23	2+	12:11	12:19	12:55	2												
19	?						14:29	14:37	15:00	1+												
19	C3.9																					
19	C4.7																					
20	**M3.9**		09:04	09:12	10:29	2+	09:05	09:11	09:50	2												
20	?																					
20	*																					
20	C2.8		11:19	11:28	12:19	2+	11:22	11:29	11:50	1+												
20	C8.6																					
20	**M4.5**						16:08	16:16	?	-												
20	?																					
20	C6.2																					
20	**M1.4**																					
21	C3.1																					
21	?																					
21	C6.3						10:50	11:00	11:20	1+												
21	C4.4						12:27	12:31	12:55	1+												
21	?																					
21	**M1.2**						13:37	13:40	14:00	1												
21	?																					
21	?																					
22	C4.6						09:09	09:16	09:45	2												
22	?																					
22	C3.2		12:00	12:08	13:04	2+	12:02	12:09	12:42	2												
22	**X1.6**		14:04	14:25	16:04	3	14:06	14:25	?	-												
22	**M1.4**						15:54	?	?	-												
22	C5.7																					
22	?																					
23	**M1.1**		09:45	09:51	10:40	2+	09:47	09:52	10:30	2												
23	?																					
23	C4.6																					
23	C5.9																					
24	**M4.0**																					
24	C3.6																					
24	C5.1						14:50	14:59	15:14	1												
24	?																					
24	?																					
25	C9.2																					
25	?																					
25	C4.6		09:44	09:52	10:07	1	09:45	09:50	10:00	1-												
25	C3.2		12:17	12:19	12:25	1-	12:15	12:20	12:29	1-												
25	?																					
25	?																					
25	?																					
25	?																					
25	?																					
25	C5.1		14:56	15:04	15:46	2+	15:02	15:05	15:15	1-												
25	C9.7		15:46	15:55	16:15	1+	15:47	15:48	15:52	1-												
25	**X1.0**																					

26	*												
26	?												
26	?												
26	?						09:52	09:54	10:00	1-			
26	?						10:05	10:08	?	-			
26	?		10:14	10:18	10:34	1	10:15	10:20	?	-			
26	**X2.0**		10:34	10:54	12:08	3	10:36	10:45	?	-			
26	?		12:08	12:16	12:27	1	12:11	12:17	?	-			
26	?		12:27	12:32	12:48	1	12:29	12:32	12:50	1			
26	C9.2		13:03	13:10	13:42	2	13:05	13:10	13:28	1			
26	?												
26	?		13:44	14:11	14:26	2	14:04	14:12	14:20	1-			
26	?						14:44	14:46	14:50	1-			
26	C5.2		15:09	15:17	16:05	2+	15:13	15:18	15:25	1-			
26	C3.5												
26	C5.3												
26	**M1.0**												
27	C9.6												
27	C9.6												
27	?												
27	?												
27	?		08:05	08:06	08:18	1-							
27	?												
27	?		09:00	09:07	09:16	1-	08:58	09:08	?	-			
27	?						09:22	09:34	?	-			
27	**M6.7**		09:16	10:07	11:08	3	09:56	10:07	?	-			
27	?		11:08	11:23	12:03	2+	11:15	11:24	12:10	2+			
27	?		12:03	12:06	13:03	2+							
27	?												
27	?												
27	**X2.0**		14:13	14:39	15:30	2+	14:13	14:25	15:30	2+			
28	C6.5												
28	*												
28	*												
28	C5.3		11:04	11:08	11:32	1+	11:04	11:08	11:20	1-			
28	*		*11:30*	*11:35*	*11:44*	*1-*	11:33	11:36	11:45	1-			
28	*												
28	*						12:48	12:51	13:00	1-			
28	?												
28	*						13:35	13:37	13:42	1-			
28	**M1.6**		13:56	14:04	14:32	2	13:57	14:06	14:40	2			
28	?												
28	*												
28	*												
29	**M1.0**												
29	**M1.2**		09:58	10:02	10:09	1-	09:57	10:03	?	-			
29	?		10:14	10:21	10:56	2							
29	?												
29	?		11:31	11:38	11:47	1-	11:32	11:39	12:00	1+			
29	?												
29	?												
29	?												
29	?												
29	?												
29	C5.5		14:02	14:08	14:13	1-	13:58	14:00	?	-			
29	?		14:13	14:21	14:23	1-							
29	**M1.4**		14:23	14:34	14:58	2	14:10	14:35	?	-			
29	?												
29	**M1.0**						16:10	16:16	?	-			
29	?												
30	?												
30	?												
30	C2.9		12:39	12:44	13:05	1+	12:40	12:45	?	-			
30	C6.9		13:05	13:13	13:33	1+	13:07	13:14	13:41	2			
30	*												
30	?												
30	C2.3												
30	?												
30	C9.7						15:29	15:33	?	-			

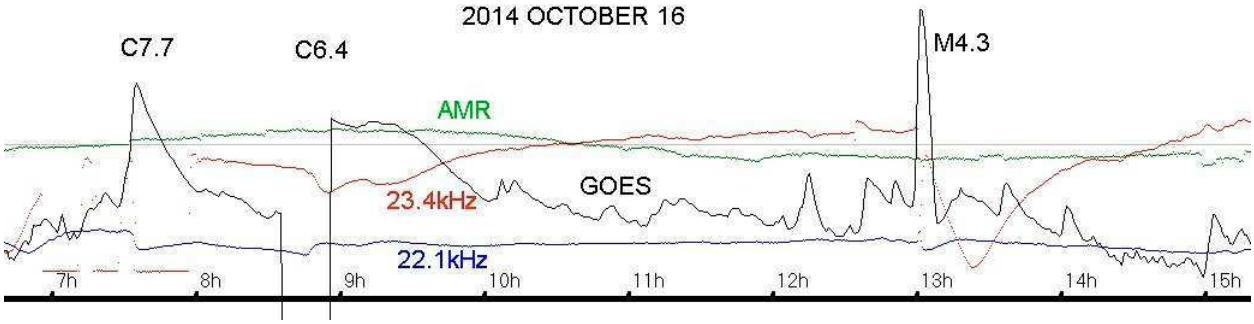

VLF flare activity 2005/14.
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
Jan 2005
May
Sep
Jan 2006
May
Sep
Jan 2007
May
Sep
Jan 2008
May
Sep
Jan 2009
May
Sep
Jan 2010
May
Sep
Jan 2011
May
Sep
Jan 2012
May
Sep
Jan 2013
May
Sep
Jan 2014
May
Sep

BAA Radio Astronomy Group. **2014 OCTOBER.**

Active region 192 (AR12192) made itself known with an M-class flare while still behind the eastern limb of the sun. As it came into view on the 17th it released a rapid-fire barrage of M and X-class flares that continued right through until the end of the month. This was by far the largest and most active sunspot region of cycle 24, and has dominated the month's activity. The tables show a total of four X-class flares recorded as SIDs, the highest number since 2005 September as cycle 23 faded. We were unable to record two further X-class flares, occurring during our night time. Its position on the Sun was close to that of AR12172/3, seen during September, and may well have developed from them while out of view on the far side. Many of the flares were complex and multiple peaked, creating different SID responses at different observing locations. I have tried to collate all of this data into a meaningful table, not an easy task this month!

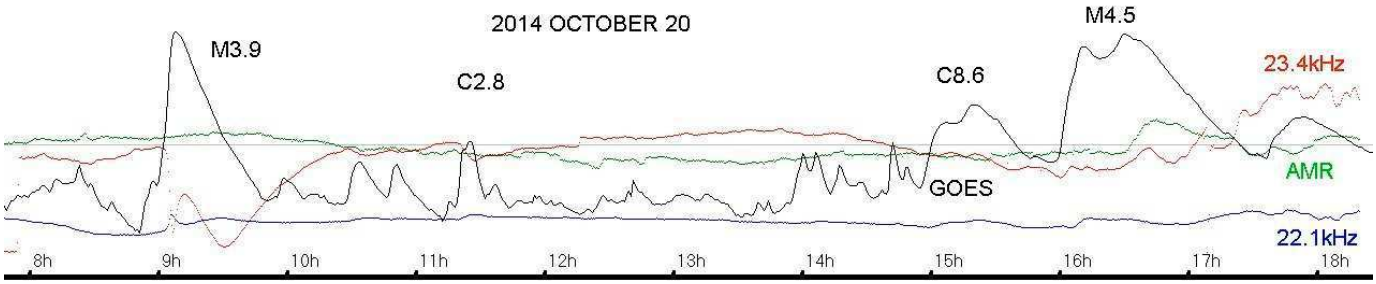
During much of this period, the background non-flare level was at about C1 or C2, so the ionosphere remained disturbed throughout the day. This has added to the difficulty of identifying SIDs from our recordings. Looking at the activity chart, the overall SID count is not that much higher than previous months, but the proportion of M and X events is much higher. The shorter daytime during October also reduces the apparent activity.

The first major flares from this group came on the 16th, before it was really visible to optical instruments. Unfortunately there was a data drop-out from GOES15 as the C6.4 flare started, but a second slightly smaller peak can be clearly seen. My own recording shows SIDs at 23.4kHz and 22.1kHz:

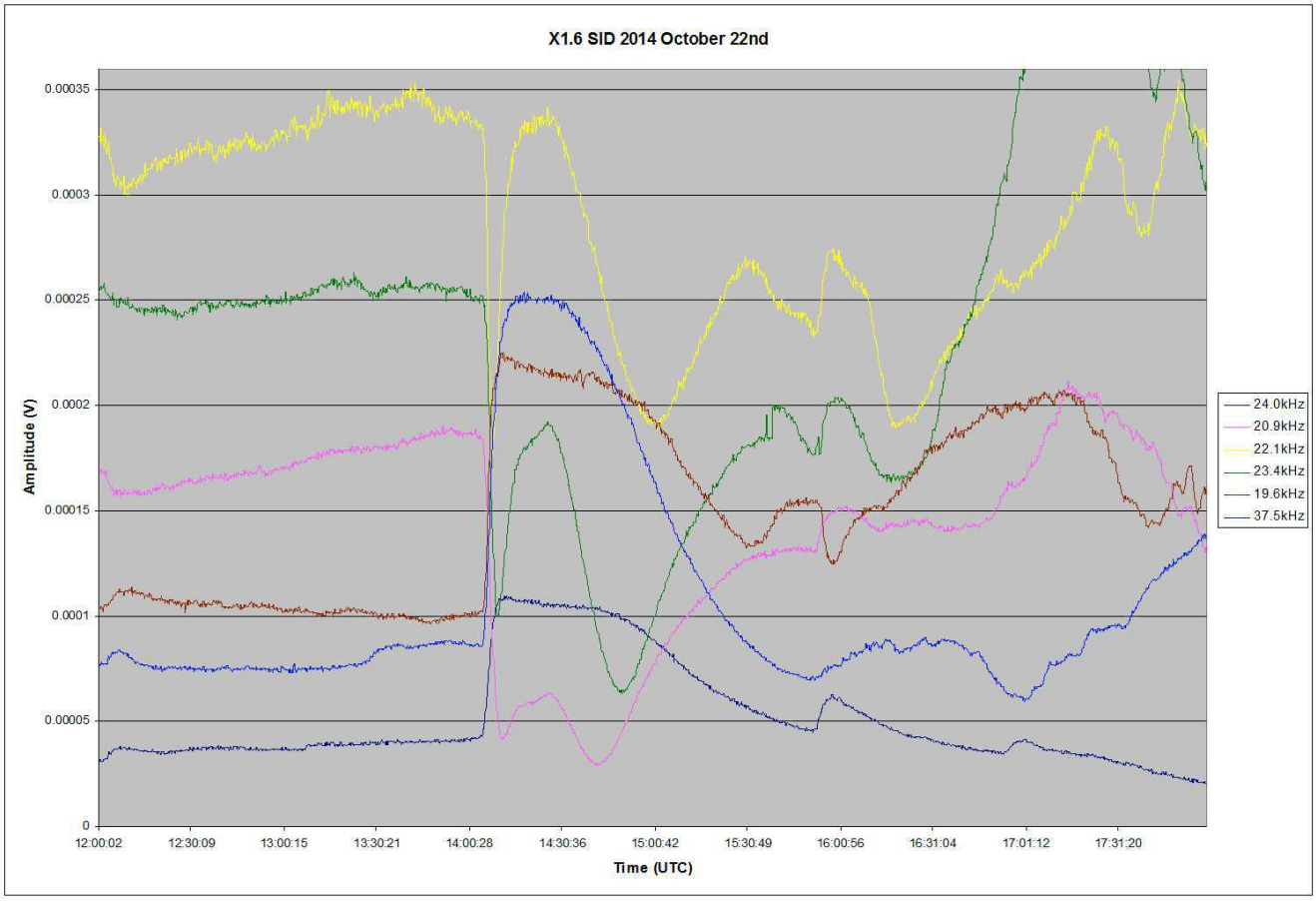


The M4.3 flare is very short with rapid rise and fall times, creating a 'spike and wave' type SID as the interference pattern moved rapidly past the receiver.

The M1.6 flare at 07:52 on the 18th was too early in the morning to produce a clear SID in the UK, although I found that it did have an effect at 22.1kHz. This was a very slow flare, lasting for three hours.



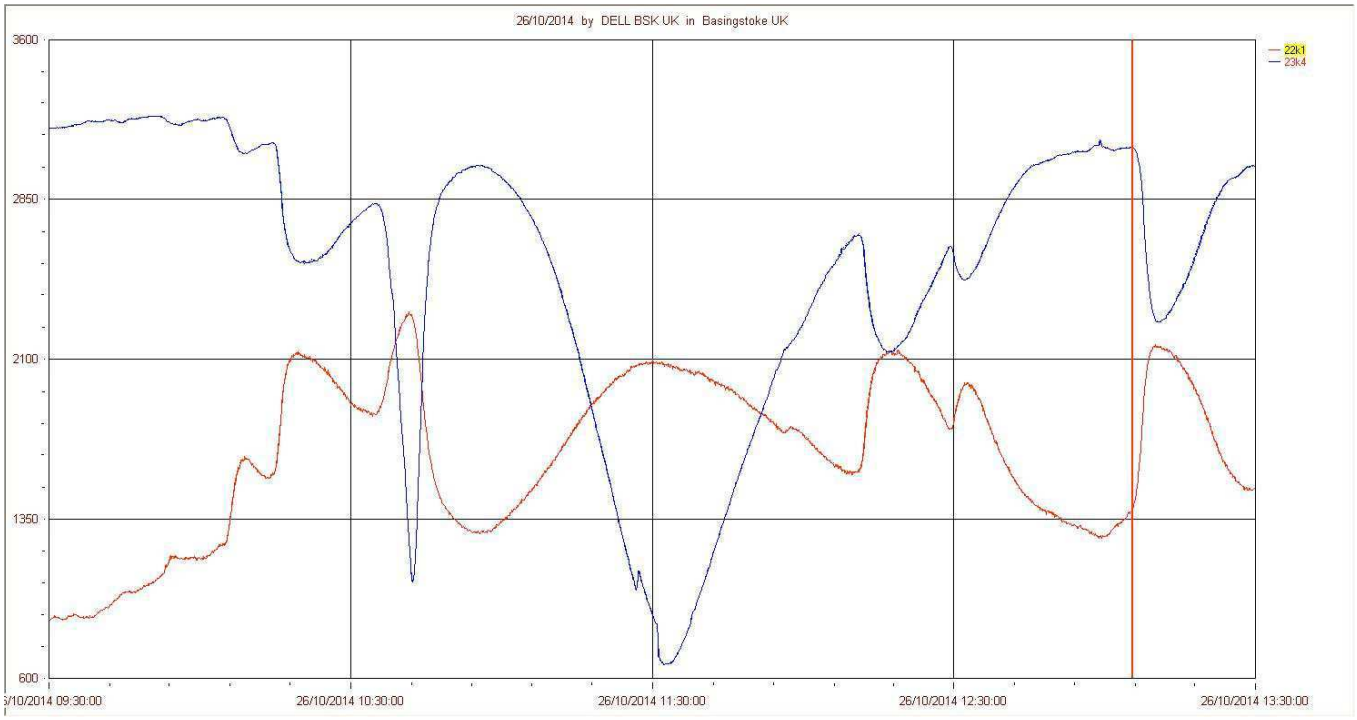
Activity continued on the 20th with another fast M3.9 flare, recorded as a 'spike and wave' SID on my recording, shown above. SIDs later in the afternoon are less well defined, although the GOES X-ray signal makes them easier to see. The C6.2 and M1.4 flares were well after local sunset here in the UK, but were recorded by Mark Edwards on the 24kHz trans-Atlantic path.



The first of the big X-class flares peaked around 14:15UT on the 22nd, as shown in Mark's chart, above. The exact time of the peak varies with frequency used: 19.6kHz 14:11, 20.27kHz 14:28, 20.9kHz 14:26, 22.1kHz 14:26, 23.4kHz 14:26, 24.0kHz 14:12, 37.5kHz 14:19. The SWPC timings for the flare were start 14:02, peak 14:06, end 22:30UT. Colin Clements has been developing a 151MHz Solar radiometer, and detected a significant VHF noise burst associated with this flare.

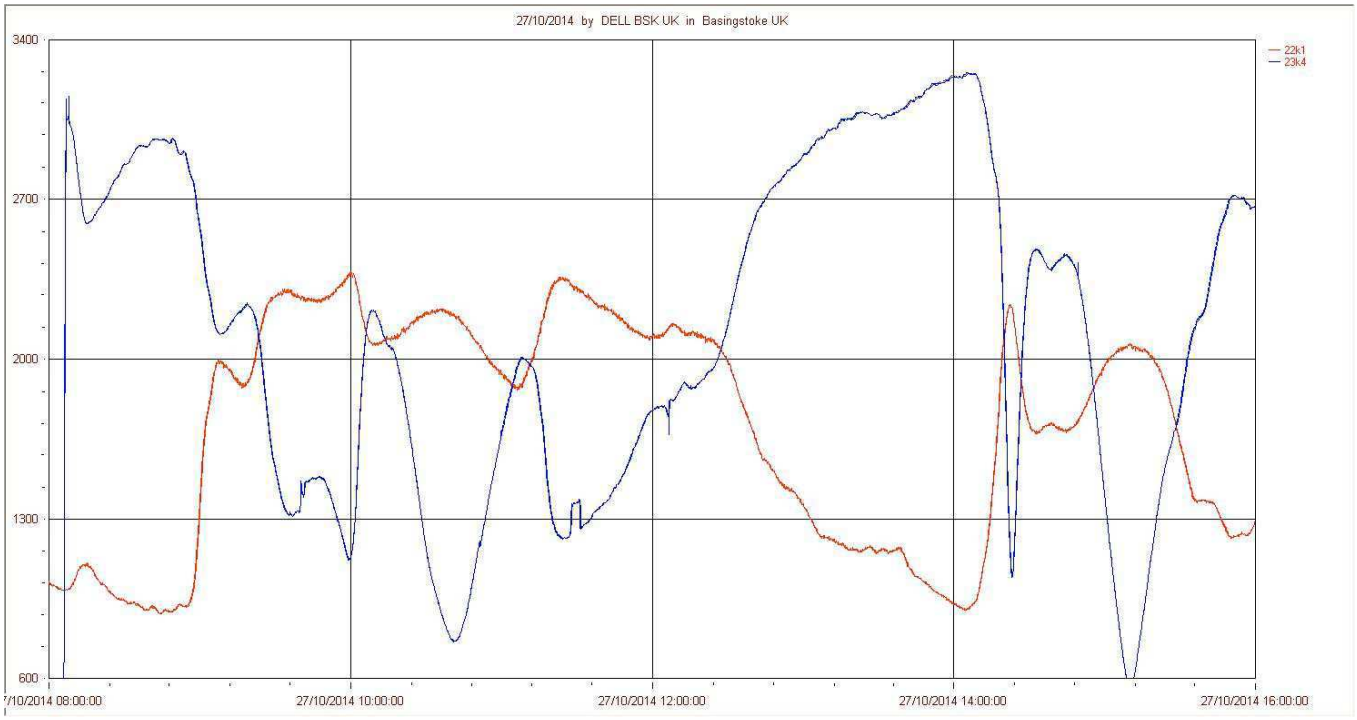
This chart by Peter Meadows shows SIDs from the two earlier flares, marked C4.6 and C3.2, as well as a hint of the M1.4 flare at 16:00.

The 23rd and 24th were relatively quiet with just a few day-time flares. An X3.1 flare, the most energetic of the month, occurred at 21:15UT on the 24th, far too late to be recorded as a SID.



(C4.4)(C7.5) X2.0 (M1.0)(C7.5) C9.2

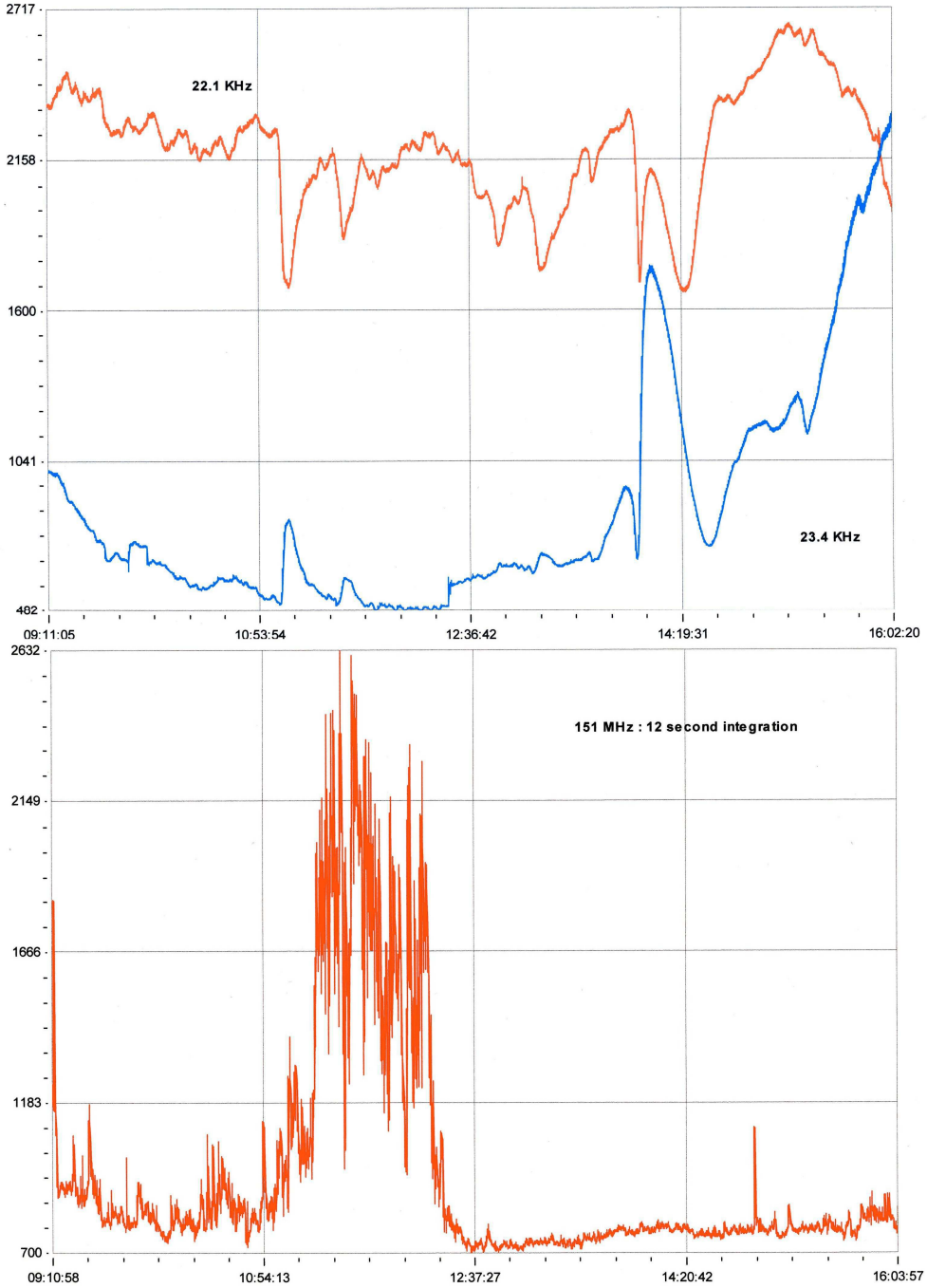
Sorting out SIDs on the 26th was much more difficult. This recording by Paul Hyde shows 22.1kHz (red) and 23.4kHz (blue), including some of the SIDs from flares that are unlisted in the SWPC bulletin. I have indicated these in brackets, with magnitudes taken from the GOES15 data file.



(M1.0) M6.7 (M2.0) (M1.1) X2.0

The 27th was just as difficult to interpret, as Paul's chart (above) shows. The M6.7 flare was quite slow with several small sub-peaks before the main event. The X2.0 flare was much faster, and gives a fairly clear SID, although apparently with two peaks just 15 minutes apart. A total of 17 SIDs were reported for the day.

The 28th was again very active, with 13 SIDs recorded. Colin Clements made an interesting recording with his 151MHz radiometer:

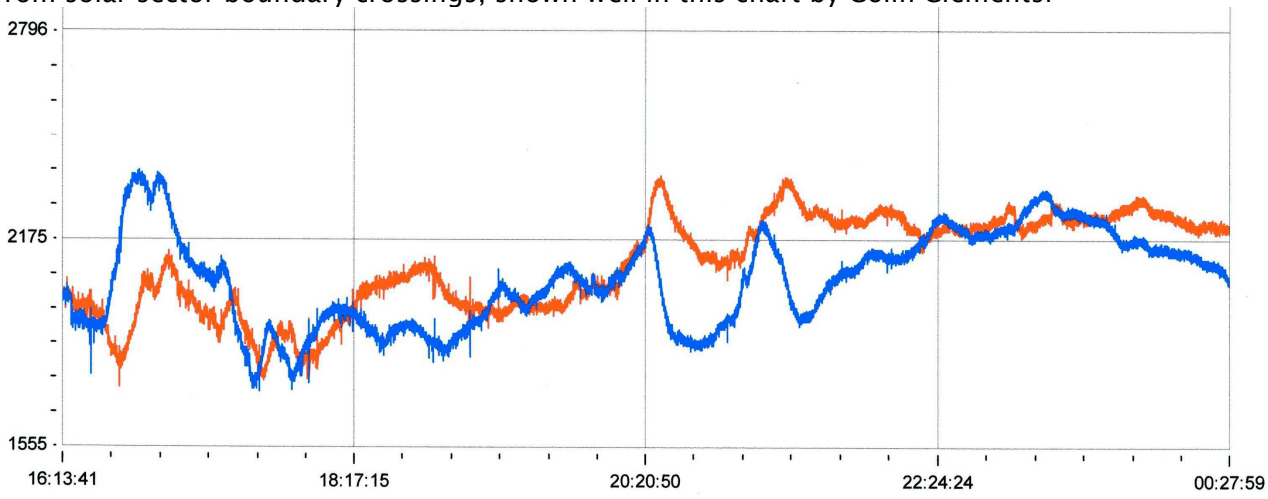


The C5.3 flare at 11:08UT has produced a clear SID at both 22.1 and 23.4kHz, with a significant 151MHz noise burst lasting for about an hour. The M1.6 flare at 14:04UT shows a much larger SID as expected, but there is no associated VHF noise burst recorded. A 12 second integration period was used on the VHF receiver to produce a smoother recording. Colin is still working on the VHF system, but it is clearly producing some useful results.

By the 29th, AR12192 was rotating off the visible disc, but was still producing flares with plenty more SIDs recorded. An M3.5 flare at 01:35 on the 30th was the last significant event, far too early in the morning for us to record. The background X-ray flux returned back below the C1 level during the 31st, but no day-time flares were produced. My own recordings show a very noisy signal at 23.4kHz throughout the last three days of October, unrelated to the X-ray activity. These are just a few of the month's highlights, meanwhile the possible return of this active region will be eagerly awaited!

MAGNETIC OBSERVATIONS.

Despite all of this flare activity from AR12192 there were very few CMEs produced. A filament eruption on the 10th produced an active period in the evening of the 14th. CHHSS effects were also present, responsible for earlier minor disturbances. The M4.3 flare at 13:00 on the 16th produced a very small SFE (approx. 8nT) that can just be seen in my chart shown previously. A more significant disturbance over the 18th and 19th was from solar sector boundary crossings, shown well in this chart by Colin Clements:



Red is the X-field, Blue is the Y-field. My own recording shows a peak disturbance of about 60nT.

Coronal holes were again responsible for disturbances over the 20th and 21st, and again early on the 22nd. Short periods of minor disturbance were seen until the 29th, again due to CHHSS effects. The presence of coronal holes for such an extended period, overlapping with strong flares from a large active region seems rather unusual, as does the lack of any substantial coronal mass ejection from these flares.

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