BAA Radio Astronomy Group. **2013 OCTOBER**

			John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola (20.3kHz)				Paul Hyde (22.1kHz)				Bob Middlefell (22.1kHz)				Mark Edwards (**20.9**/24.0/*19.6kHz*)			
	Xray 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)	
6	C1.0	1																	*11:25*	*11:27*	*11:32*	*1-*
7	C2.3	2									15:37	15:41	?	-								
7	*	1									15:48	15:51	?	-								
9	C1.0	1					06:03	06:11	06:22	1												
10	C1.6	3									11:00	11:04	11:24	1					11:02	11:04	11:12	1-
10	*	1																	15:46	15:48	15:48	1-
10	C1.4	1																	16:24	16:25	16:31	`
10	C1.2	1																	16:44	16:47	16:51	1-
10	C1.6	1																	17:00	17:03	17:08	1-
11	**M1.5**	6	*07:13*	*07:17*	*07:25*	*1-*	07:06	07:20	07:28	1	07:10	07:16	07:36	1+					*07:12*	*07:27*	*07:46*	*2*
11	C5.4	6	09:14	09:22	09:50	2					09:10	09:21	09:59	2+					09:15	09:30	09:51	2
11	?	2																	***10:41***	***11:00***	***11:06***	***1***
11	?	2																	**11:13**	**11:22**	**11:37**	**1**
11	C6.2	8	12:23	12:36	13:01	2	12:24	12:26	12:38	1-	12:15	12:32	13:14	2+	12:55	13:00	14:15	2+	*12:21*	*12:34*	*13:22*	*2+*
11	*	2	14:33	14:38	?	-																
11	C4.7	4	14:46	14:57	15:08	1					14:32	14:40	?	-								
11	?	1									14:45	14:54	15:32	2+								
11	C2.3	1																	16:56	16:59	17:07	1-
12	C2.0	4					08:17	08:20	08:29	1-	08:15	08:18	08:31	1-					*08:14*	*08:17*	*08:28*	*1-*
12	*	3									08:49	08:55	09:26	2					*08:49*	*08:54*	*09:05*	*1-*
12	C1.5	2									10:45	10:48	10:56	1-					**10:45**	**10:47**	**10:55**	**1-**
12	*	3									11:28	11:36	11:51	1					**11:32**	**11:33**	**11:36**	**1-**
12	C2.4	6	12:06	12:14	12:32	1+					12:05	12:17	12:44	2					12:06	12:16	12:35	1+
12	?	1																	15:02	15:06	15:09	1-
12	?	1																	17:10	17:10	17:23	1-
13	C4.5	2																	17:57	17:58	18:04	1-
14	C8.0	8	13:00	13:21	14:44	3					12:58	13:18	14:24	3	12:14	12:18	13:54	3	13:00	13:19	14:46	3
15	C2.8	4	?	08:02	08:09	-	07:57	08:04	08:07	1-									*07:59*	*08:03*	*08:06*	*1-*
15	C2.8	4	08:14	18:17	08:25	1-	08:16	08:20	08:26	1-									*08:16*	*08:18*	*08:25*	*1-*
15	**M1.8**	7	08:33	08:40	09:57	2+	08:30	08:39	08:42	1-	08:32	08:56	10:15	3					*08:33*	*08:41*	*?*	-
15	*	1																	*08:47*	*08:58*	*10:02*	*2+*
15	C2.9	7	10:28	10:33	10:54	1+					10:27	10:33	10:47	1					10:28	10:31	10:37	1-
15	?	1																	**10:57**	**11:01**	**11:06**	**1-**
15	C2.2	1																	14:17	14:24	14:37	1
15	?	1																	14:39	14:45	?	-
15	C4.4	5									14:15	14:58	15:24	2+					14:48	14:58	15:23	2
15	C6.5	6					15:26	15:39	15:51	1	15:25	15:37	?	-					15:26	15:39	?	-
15	*	1																	15:58	16:00	16:30	1+
15	C1.8	1																	17:11	17:13	17:15	1-
16	C1.8	4									09:16	09:23	09:56	2					***09:16***	***09:18***	***09:49***	***2***
16	C1.4	1																	13:59	14:02	14:18	1
16	C8.9	6									14:31	14:38	15:13	2					14:30	14:35	15:08	2
17	*	1																	**09:41**	**09:54**	**10:22**	**2**
17	C5.8	7	10:28	10:34	?	-					10:28	10:33	11:21	2+					10:29	10:32	10:44	1-
17	?	3									11:49	11:58	?	-					11:51	11:57	?	-
17	C4.8	7	11:50	12:05	12:45	2+					12:02	12:07	12:45	2					12:03	12:06	12:32	1+
17	?	1																	*12:45*	*13:00*	*13:23*	*2*
17	?	1																	***12:53***	***13:02***	***13:20***	***1+***
17	*	1																				
17	**M1.2**	4									15:12	15:40	?	-					15:08	15:40	16:37	3
18	C3.3	1																				
18	C5.0	7	10:19	10:33	?	-					10:14	10:35	?	-					10:21	10:31	?	-
18	C4.7	5	10:52	10:55	11:33	2					10:53	10:56	11:22	1+					10:52	10:56	11:05	1-
18	*	1																	13:58	13:59	14:04	1-
18	?	1																	14:09	14:11	14:17	1-
18	*	1																	15:06	15:11	?	-
18	C8.4	6									15:15	15:28	15:57	2					15:14	15:28	16:11	2+
19	C2.9	5	09:31	09:34	09:50	1					09:30	09:37	10:31	2+					*09:32*	*09:41*	*10:15*	*2*
19	C1.9	2									10:35	10:41	11:02	1+					*10:38*	*10:41*	*10:59*	*1*
19	C1.2	1																	14:28	14:31	14:38	1-
20	C2.9	2									08:37	08:40	08:49	1-								
20	?	1																				
20	C2.0	1									12:42	12:48	13:01	1								
22	C1.6	3	11:09	11:14	11:25	1-					11:10	11:13	11:30	1					11:12	11:13	11:15	1-
22	C1.4	2									12:57	13:00	13:14	1-					12:58	13:02	13:06	1-
22	C1.8	2									13:28	13:33	13:48	1					13:28	13:34	13:53	1
22	?	2	14:57	15:03	15:12	1-													14:51	14:57	?	-
22	**M1.0**	5									14:52	15:20	?	-					15:00	15:20	15:58	2+
23	C3.6	1																				
23	C6.5	7	11:14	11:19	12:02	2+					11:13	11:21	13:01	3					11:15	11:21	11:40	1
23	*	1																	12:38	12:38	12:47	1-
23	?	1																	**12:54**	**12:57**	**13:06**	**1-**
23	*	1																	14:08	14:08	14:14	1-
23	*	1																	14:37	14:38	14:41	1-
23	C1.8	1																	15:41	15:43	15:47	1-
23	?	1																	15:50	15:52	15:58	1-
23	C3.6	1																	17:10	17:11	17:19	1-
24	C9.3	1																				
24	C2.4	1																				
24	**M2.5**	7	10:02	10:11	?	-					09:46	10:11	?	-					10:01	10:14	?	-
24	**M3.5**	7	10:31	10:37	11:42	2+					10:31	10:37	11:42	2+					10:30	10:38	11:44	2+
24	C2.4	6									12:58	13:17	13:39	2					13:02	13:13	13:23	1
24	C2.4	3																	**14:05**	**14:15**	**14:31**	**1+**
25	**X1.7**	7	*07:59*	*08:04*	*08:40*	2					07:57	08:02	?	-					*07:57*	*08:06*	*09:12*	*2+*
25	*	3	09:45	09:55	?	-													*09:46*	*09:59*	*?*	-
25	**M1.0**	7	10:05	10:13	11:13	2+					09:46	10:10	11:26	3					*10:04*	*10:13*	*10:57*	*2+*
25	C1.8	1																	13:09	13:18	13:23	1-
25	C2.3	1																	13:34	13:40	13:50	1-
25	C7.9	5	14:34	14:36	?	-													14:35	14:40	?	-
25	**X2.1**	7	14:55	15:06	16:30	3													14:53	15:01	16:50	3
25	**M1.3**	2																	17:05	17:11	17:36	1+
26	**M2.3**	1																				
26	C5.2	3	08:39	08:46	09:04	1					08:40	08:48	?	-					*08:43*	*08:49*	*?*	-
26	C4.4	2									08:55	08:57	?	-					*08:55*	*08:57*	*09:08*	*1-*
26	**M1.5**	7	09:20	09:28	?	-					09:18	09:29	?	-	09:22	?	10:22	2+	*09:18*	*09:28*	*?*	-
26	**M1.5**	6	09:35	09:41	10:34	2+					09:35	09:41	10:19	2					*09:35*	*09:41*	*10:07*	*1+*
26	**M1.8**	8	10:48	11:22	12:20	3					10:44	11:13	12:28	3	10:53	10:59	12:53	3	10:50	11:17	12:16	3
26	C2.8	3	13:19	13:21	13:27	1-					13:19	13:23	13:44	1					13:20	13:23	13:42	1

26	C2.0	1																15:48	15:51	16:00	1-
26	C8.8	2																17:11	17:16	?	-
26	C6.5	1																17:27	17:32	17:46	1
26	C7.7	1																19:26	19:28	19:35	1-
27	C1.9	1																			
27	?	1																			
27	C3.5	6	*09:31*	*09:37*	*09:45*	1-					09:31	09:37	10:07	2				***09:32***	***09:41***	***10:04***	***1+***
27	?	1																10:38	10:42	10:50	1-
27	*	1																***11:52***	***11:55***	***11:59***	***1-***
27	*	1																12:19	12:23	12:30	1-
27	**M3.5**	8	12:38	12:49	13:47	2+					12:38	12:49	?	-	12:40	12:44	13:40	2+	12:36	12:47	?	-
27	*	1																	13:18	13:20	13:38	1
27	C4.0	6									13:41	13:48	14:34	2+					13:42	13:48	?	-
27	*	1																	13:59	14:00	14:23	1
27	*	1																	***14:51***	***14:55***	***15:11***	***1***
27	*	1																	15:22	15:27	?	-
27	*	1																	15:33	15:37	15:50	1-
27	*	1																	16:39	16:47	16:52	1-
27	C5.7	1																	17:53	17:56	18:10	1-
28	C5.2	7	09:17	09:22	09:29	1-					09:17	09:24	09:52	2					09:18	09:21	09:30	1-
28	*	1																	***09:59***	***10:00***	***10:05***	***1-***
28	*	2																	*10:26*	*10:31*	*10:40*	*1-*
28	**M1.4**	7	11:35	11:51	13:04	3					11:35	11:53	12:28	2+					*11:35*	*12:04*	*13:03*	*3*
28	?	1																	*13:40*	*13:44*	*13:57*	*1-*
28	**M2.8**	8	14:02	14:08	?	-					14:02	14:08	14:48	2+					*14:02*	*14:09*	*14:48*	*2+*
28	**M2.7**	6	14:57	15:02	?	-					14:57	15:03	15:47	2+					*14:57*	*15:03*	*15:09*	*1-*
28	**M4.4**	6	15:09	15:15	15:24	1-													*15:10*	*15:17*	*15:44*	*2*
28	?	1																	***15:48***	***15:57***	***16:09***	***1***
29	C2.3	1																				
29	?	2																	***09:38***	***09:40***	***09:51***	***1-***
29	?	1																	***09:54***	***09:56***	***10:02***	***1-***
29	C6.3	7	10:05	10:07	10:30	1					10:03	10:15	10:46	2					*10:05*	*10:08*	*?*	-
29	?	1																	*10:11*	*10:16*	*10:31*	*1*
29	C2.0	6	12:09	12:11	21:25	3+					12:08	12:13	12:42	2					12:08	12:13	12:30	1
29	*	1																	*13:32*	*13:37*	*13:43*	*1-*
29	?	1																	14:34	14:34	14:44	1-
29	C3.5	2																	15:26	15:34	15:51	1
29	C9.3	1																	18:29	18:33	18:41	1-
30	C1.3	1																				
31	**M1.9**	8	13:41	13:49	14:32	2+	13:33	13:55	14:30	2+	13:40	13:45	?	-					13:41	13:49	14:52	2+

BAA Radio Astronomy Group. **2013 OCTOBER**

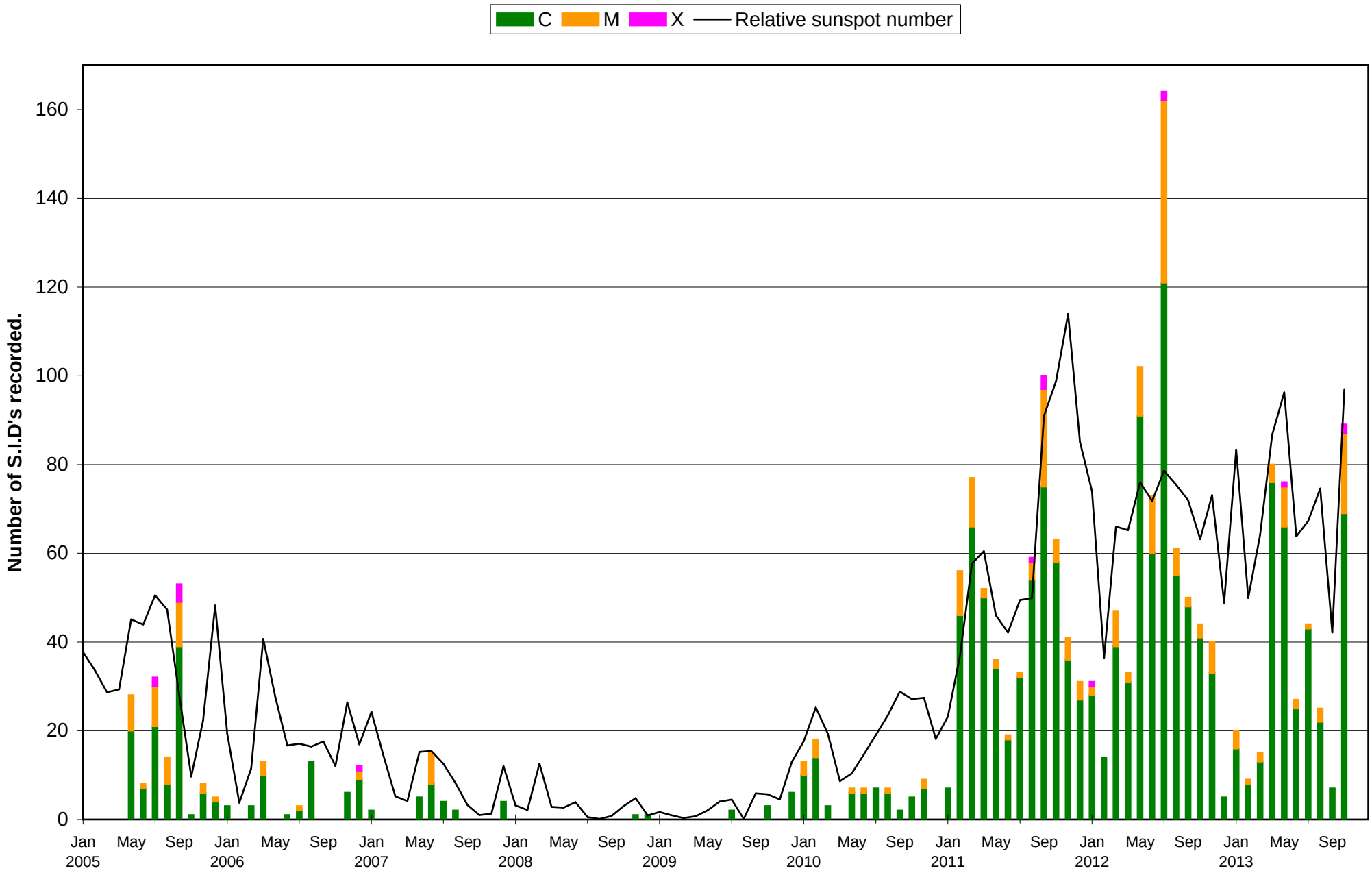
			Colin Clements (23.4kHz/*22.1kHz*)				Peter King (18.3kHz)			Richard Kaye(19.6/23.4/20.9kHz)				John Wardle (19.6/23.4kHz)				Steve Parkinson (Various)			
			AAVSO receiver, 0.76m screened loop aerial.				Own designed receiver, 1.4m loop aerial.			Pre-amplifier + PC software receiver.				PC soundcard, long wire aerial.				Tuned radio frequency receivers, 0.58m frame aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)	START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
6	C1.0																				
7	C2.3									15:37	15:40	15:46	1-								
7	*																				
9	C1.0																				
10	C1.6																	11:00	11:03	11:15	1-
10	*																				
10	C1.4																				
10	C1.2																				
10	C1.6																				
11	**M1.5**									07:00	07:19	07:45	2					07:10	07:25	?	-
11	C5.4		09:13	09:22	09:48	2				09:12	09:16	09:23	1-					09:14	09:22	09:50	2
11	?																	10:41	10:52	11:06	1
11	?		11:28	11:29	11:38	1-															
11	C6.2		12:17	12:36	13:46	3				12:17	12:33	12:53	2					12:18	12:27	13:10	2+
11	*		*14:31*	*14:39*	*14:45*	*1-*															
11	C4.7		*14:45*	*14:54*	*15:13*	*1+*												14:34	14:39	15:10	2
11	?																				
11	C2.3																				
12	C2.0									08:15	08:17	08:22	1-								
12	*									08:50	08:53	09:13	1								
12	C1.5																				
12	*																	11:28	11:34	?	-
12	C2.4		12:03	12:16	13:01	2+				12:06	12:19	12:29	1					12:05	12:15	12:31	1+
12	?																				
12	?																				
13	C4.5													17:53	17:57	18:02	1-				
14	C8.0		12:58	13:18	14:18	2+				13:01	13:20	14:01	2+	13:01	13:17	14:06	2+	13:01	13:19	14:15	2+
15	C2.8									07:59	08:04	08:14	1-								
15	C2.8									08:16	08:19	08:27	1-								
15	**M1.8**		08:34	08:59	10:26	3				08:33	09:02	10:14	3					08:33	08:38	?	-
15	*																				
15	C2.9		10:26	10:30	10:57	1+				10:27	10:34	10:56	1+	10:29	10:32	10:41	1-	10:28	10:33	10:45	1-
15	?																				
15	C2.2																				
15	?																				
15	C4.4		*14:49*	*14:57*	*15:21*	*1+*				14:50	14:58	15:13	1					14:52	14:58	?	-
15	C6.5		14:52	15:23	15:34	2				15:24	15:36	15:48	1					15:27	15:37	?	-
15	*																				
15	C1.8																				
16	C1.8									09:14	09:22	10:04	2+	09:15	09:22	09:37	1				
16	C1.4																				
16	C8.9		14:30	14:36	14:46	1-				14:31	14:36	14:57	1+	14:31	14:37	14:55	1	14:31	14:37	15:10	2
17	*																				
17	C5.8		10:26	10:34	10:43	1-				10:28	10:37	10:56	1+	10:28	10:35	11:00	1+	10:29	10:34	11:15	2+
17	?		*11:47*	*11:58*	*12:44*	*2+*															
17	C4.8		11:47	12:08	13:45	3				11:49	12:06	12:25	2	12:02	12:08	12:26	1	11:51	?	12:35	2
17	?																				
17	?																				
17	*									14:39	14:43	15:10	1+								
17	**M1.2**													15:11	15:41	16:09	2+	15:13	15:39	?	-
18	C3.3													07:27	07:32	07:39	1-				
18	C5.0		10:18	10:29	10:51	2				10:20	10:33	11:21	2+	10:21	10:36	10:53	1+	10:18	10:34	11:15	2+
18	C4.7		10:51	10:54	11:06	1-								10:53	10:56	11:05	1-				
18	*																				
18	?																				
18	*																				
18	C8.4		15:15	15:19	15:40	1				15:12	15:37	16:23	2+	15:14	15:26	15:40	1+	15:16	15:27	15:45	1+
19	C2.9									09:31	09:39	09:47	1-					09:31	09:37	09:51	1
19	C1.9																				
19	C1.2																				
20	C2.9									08:36	08:42	09:03	1+								
20	?									11:54	12:02	13:12	2+								
20	C2.0																				
22	C1.6																				
22	C1.4																				
22	C1.8																				
22	?																				
22	**M1.0**									14:49	15:19	15:52	2+	15:02	15:22	15:44	2	14:53	15:20	?	-
23	C3.6													06:02	06:10	06:27	1				
23	C6.5		11:13	11:19	12:01	2+				11:16	11:22	11:59	2	11:15	11:20	11:40	1	11:15	11:20	11:50	2
23	*																				
23	?																				
23	*																				
23	*																				
23	C1.8																				
23	?																				
23	C3.6																				
24	C9.3													05:50	06:00	06:13	1				
24	C2.4													09:54	09:57	10:02	1-				
24	**M2.5**		10:02	10:11	10:31	1+				10:03	10:10	10:31	1+	10:04	10:12	10:31	1+	10:03	10:10	?	-
24	**M3.5**		10:31	10:37	11:40	2+				10:31	10:38	12:14	3	10:31	10:38	11:00	1+	10:32	10:37	11:20	2+
24	C2.4		13:00	13:12	13:47	2+				13:05	13:08	13:20	1-	13:01	13:09	13:22	1	13:02	13:10	13:25	1
24	C2.4									14:04	14:08	14:25	1					14:03	14:11	14:20	1-
25	**X1.7**		07:56	08:03	09:45	3				07:56	08:05	09:44	3	07:54	07:58	08:46	2+	07:57	08:04	09:00	2+
25	*		*09:45*	*09:50*	*09:54*	*1-*															
25	**M1.0**		09:45	10:11	11:19	3				09:47	10:11	10:56	2+	09:46	09:59	11:00	2+	09:46	09:55	11:00	2+
25	C1.8																				
25	C2.3																				
25	C7.9		*14:33*	*14:37*	*14:55*	*1*				14:36	14:40	14:55	1					14:35	14:40	?	-
25	**X2.1**		14:51	15:06	16:22	3				14:55	15:01	16:06	2+	14:55	15:02	15:45	2+	14:55	15:06	16:15	2+
25	**M1.3**									17:07	17:10	17:30	1								
26	**M2.3**									05:53	06:08	06:55	2+								
26	C5.2																				
26	C4.4																				
26	**M1.5**		09:19	09:28	09:34	1-				09:21	09:28	09:35	1-					09:20	09:30	?	-
26	**M1.5**		09:34	09:39	10:41	2+				09:36	09:41	10:00	1	09:17	09:40	09:43	1+				
26	**M1.8**		10:41	11:17	13:27	3+				10:46	11:16	11:52	2+	10:57	11:18	11:41	2	10:50	11:15	12:30	3
26	C2.8																				

26	C2.0																		
26	C8.8							17:14	17:18	17:48	2								
26	C6.5																		
26	C7.7																		
27	C1.9							07:42	07:57	08:12	1+								
27	?							08:26	08:36	08:49	1								
27	C3.5							09:31	09:45	10:13	2	09:33	09:40	09:46	1-	09:33	09:38	09:45	1-
27	?																		
27	*																		
27	*																		
27	**M3.5**		12:36	12:48	13:31	2+		12:38	12:49	13:30	2+	12:44	12:49	13:16	1+	12:38	12:50	?	-
27	*																		
27	C4.0		*13:39*	*13:45*	*13:55*	*1-*		13:40	13:47	14:03	1	13:42	13:51	14:00	1-	13:42	13:49	14:00	1-
27	*																		
27	*																		
27	*																		
27	*																		
27	*																		
27	C5.7																		
28	C5.2		09:15	09:22	09:41	1+		09:16	09:25	09:50	2	09:17	09:26	09:52	2	09:17	09:22	09:40	1
28	*																		
28	*							10:26	10:29	10:45	1								
28	**M1.4**		11:36	11:56	12:57	2+		11:37	11:52	12:58	2+	11:35	11:54	13:00	2+	11:35	12:00	13:00	2+
28	?																		
28	**M2.8**		14:01	14:08	14:33	1+		14:03	14:09	14:58	2+	14:01	14:04	14:11	1-	14:02	14:08	14:48	2+
28	**M2.7**		14:58	15:02	15:07	1-						14:57	15:02	15:10	1-	14:58	15:01	15:45	2+
28	**M4.4**		15:07	15:14	15:53	2+		14:59	15:14	16:26	3	15:10	15:17	15:34	1				
28	?																		
29	C2.3											07:51	07:54	08:00	1-				
29	?							09:40	09:41	09:49	1-								
29	?																		
29	C6.3		10:06	10:14	10:21	1-		10:07	10:08	10:26	1	10:04	10:21	10:46	2	10:05	10:15	10:40	2
29	?																		
29	C2.0							12:08	12:19	12:42	2	12:08	12:13	12:22	1-	12:08	12:13	12:34	1+
29	*																		
29	?																		
29	C3.5							15:30	15:34	15:39	1-								
29	C9.3																		
30	C1.3							10:40	10:42	10:59	1								
31	**M1.9**		13:40	13:50	14:21	2		13:38	13:49	14:43	2+	13:40	13:53	14:17	2	13:40	13:51	14:30	2+

BAA Radio Astronomy Group. **2013 OCTOBER**

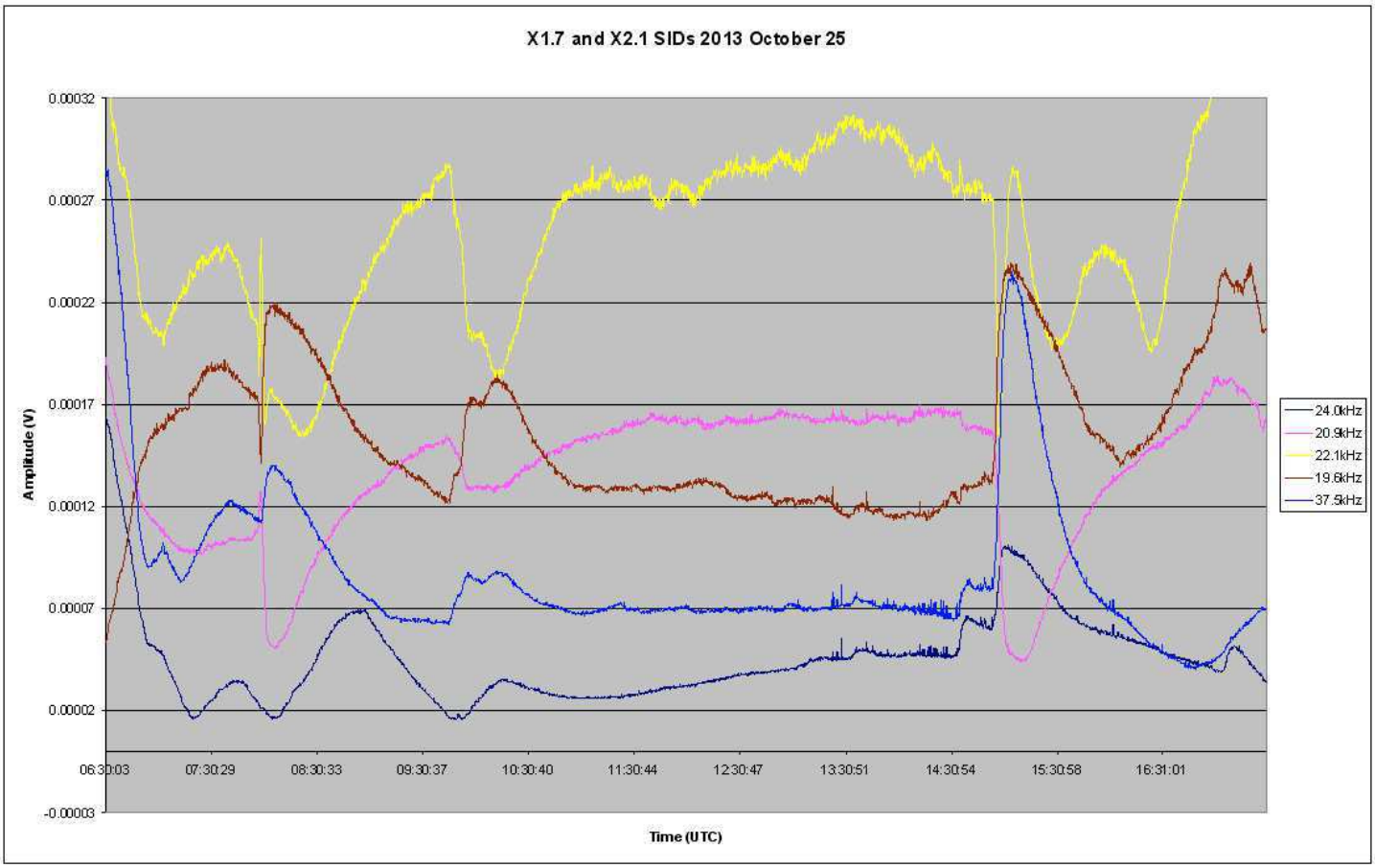
DAY			Simon Dawes (various) PC soundcard and TRF receiver with 1m loop aerial. START PEAK END (UT)	Gordon Fiander (19.6/22.1kHz) PC sound card. START PEAK END (UT)	John Elliott (19.6kHz) Tuned radio frequency receiver, 0.5m frame aerial. START PEAK END (UT)	Martyn Kinder (19.6kHz/*22.1khz*) Tuned radio frequency receiver, 0.58m frame aerial. START PEAK END (UT)	Mark Horn (23.4kHz) Tuned radio frequency receiver, 0.58m frame aerial. START PEAK END (UT)
6	C1.0						
7	C2.3						
7	*						
9	C1.0						
10	C1.6						
10	*						
10	C1.4						
10	C1.2						
10	C1.6						
11	**M1.5**						
11	C5.4						
11	?						
11	?						
11	C6.2						
11	*						
11	C4.7						
11	?						
11	C2.3						
12	C2.0						
12	*						
12	C1.5						
12	*						
12	C2.4						
12	?						
12	?						
13	C4.5						
14	C8.0						
15	C2.8						
15	C2.8						
15	**M1.8**						
15	*						
15	C2.9						
15	?						
15	C2.2						
15	?						
15	C4.4						
15	C6.5						
15	*						
15	C1.8						
16	C1.8						
16	C1.4						
16	C8.9						
17	*						
17	C5.8						
17	?						
17	C4.8						
17	?						
17	?						
17	*						
17	**M1.2**						
18	C3.3						
18	C5.0						
18	C4.7						
18	*						
18	?						
18	*						
18	C8.4						
19	C2.9						
19	C1.9						
19	C1.2						
20	C2.9						
20	?						
20	C2.0						
22	C1.6						
22	C1.4						
22	C1.8						
22							
22							
23	C3.6						
23	C6.5						
23	*						
23	?						
23	*						
23	*						
23	C1.8						
23	?						
23	C3.6						
24	C9.3						
24	C2.4						
24	**M2.5**						
24	**M3.5**						
24	C2.4						
24	C2.4						
25	**X1.7**						
25	*						
25	**M1.0**						
25	C1.8						
25	C2.3						
25	C7.9						
25	**X2.1**				14:50 15:15 16:10 2+		
25	**M1.3**						
26	**M2.3**						
26	C5.2						
26	C4.4						
26	**M1.5**						
26	**M1.5**						
26	**M1.8**						
26	C2.8						

26	C2.0							
26	C8.8							
26	C6.5							
26	C7.7							
27	C1.9							
27	?							
27	C3.5							
27	?							
27	*							
27	*							
27	**M3.5**							
27	*							
27	C4.0							
27	*							
27	*							
27	*							
27	*							
27	*							
27	C5.7							
28	C5.2							
28	*							
28	*							
28	**M1.4**							
28	?							
28	**M2.8**				14:05	14:06	14:35	1+
28	**M2.7**							
28	**M4.4**				15:00	15:15	15:35	2
28	?							
29	C2.3							
29	?							
29	?							
29	C6.3							
29	?							
29	C2.0							
29	*							
29	?							
29	C3.5							
29	C9.3							
30	C1.3							
31	**M1.9**							

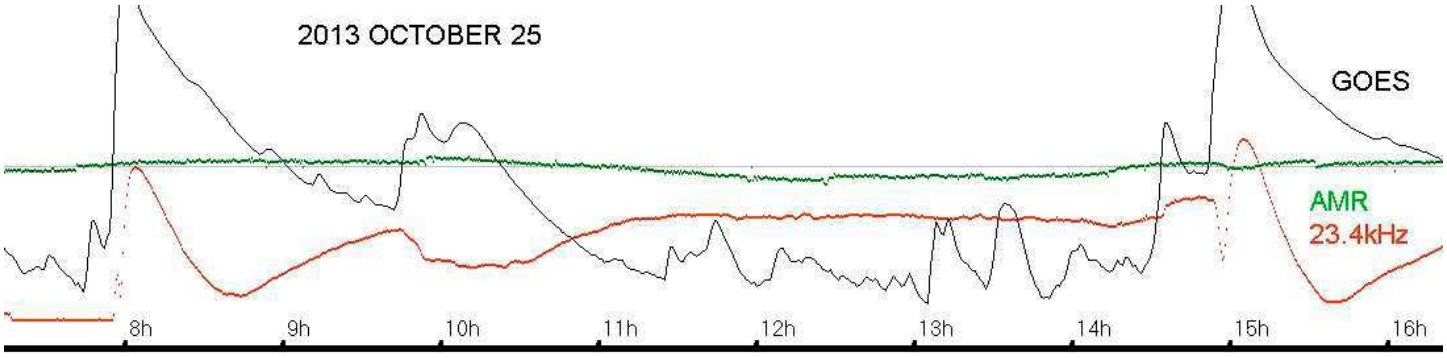

VLF flare activity 2005/13.
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
Jan 2005
May
Sep
Jan 2006
May
Sep
Jan 2007
May
Sep
Jan 2008
May
Sep
Jan 2009
May
Sep
Jan 2010
May
Sep
Jan 2011
May
Sep
Jan 2012
May
Sep
Jan 2013
May
Sep

BAA Radio Astronomy Group. **2013 OCTOBER.**

Solar activity increased dramatically through October giving a fifth peak to the activity in cycle 24. The background X-ray flux was at about B2 levels at the start of the month, increasing from the 10th to reach C2 levels on the 25th and 26th. This did make some of the smaller C-class flares rather difficult to detect as SIDs. Notable were four X-class flares, an X2.3 peaking at 21:54UT on the 29th was the most energetic, but sadly too late in the day to record as a SID. We did have the bonus however of recording two X-class flares on the 25th. Mark Edwards has them both on his chart, together with the rest of the day's activity.

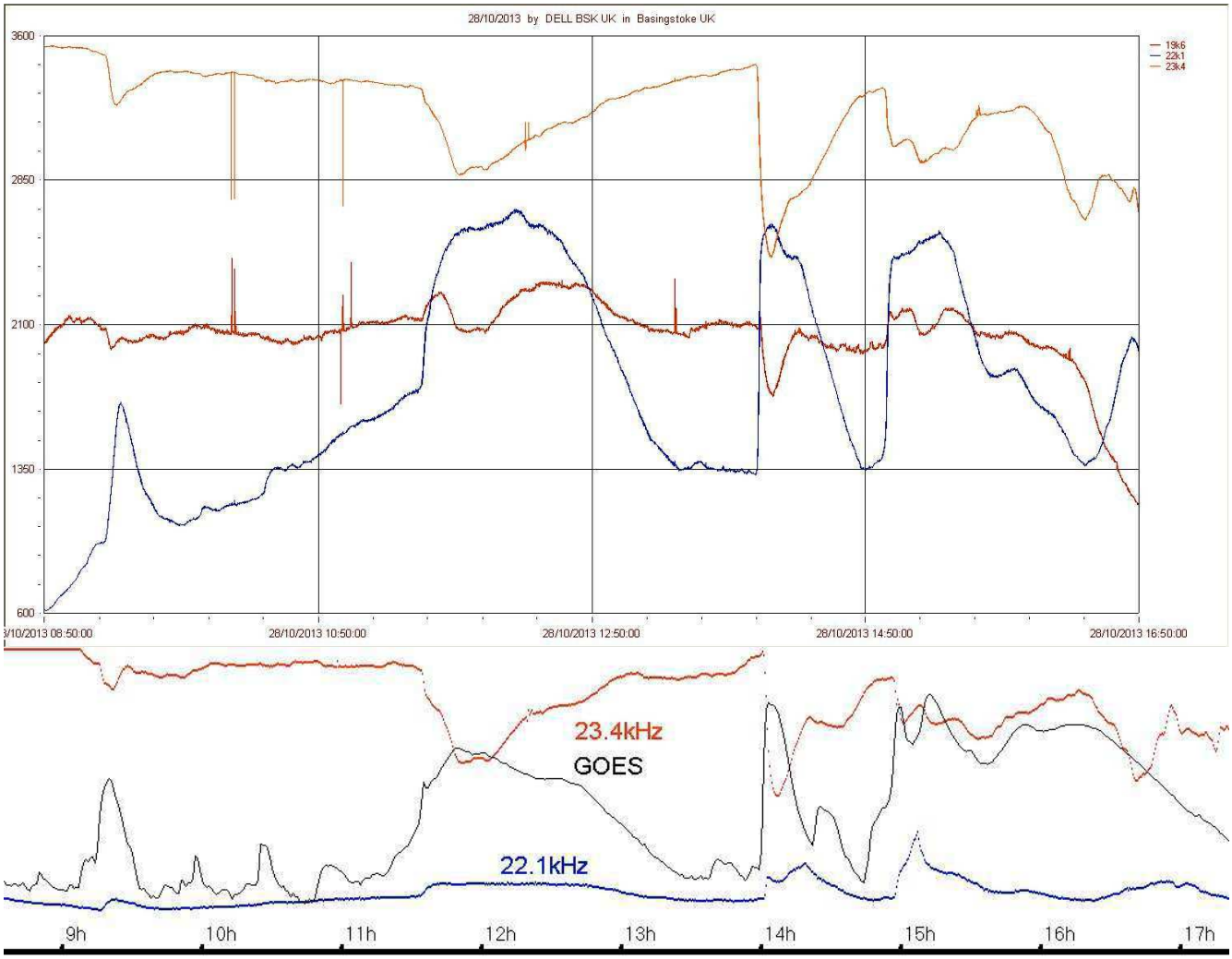


Both the X1.7 (08:05) and the X2.1 (15:05) have very short rise times compared to the M1.0 at 10:12. Just visible is the M1.3 flare at 17:11UT in the 24kHz signal from NAA. The M1.3 flare has also produced a good variety of SID shapes, mostly double-peaked. I have added the GOES X-ray data to my own recording:



Active region 1882 was responsible for both of the X-class and the M1.3 flare as well as the many peaks in between, giving quite a complex overall structure.

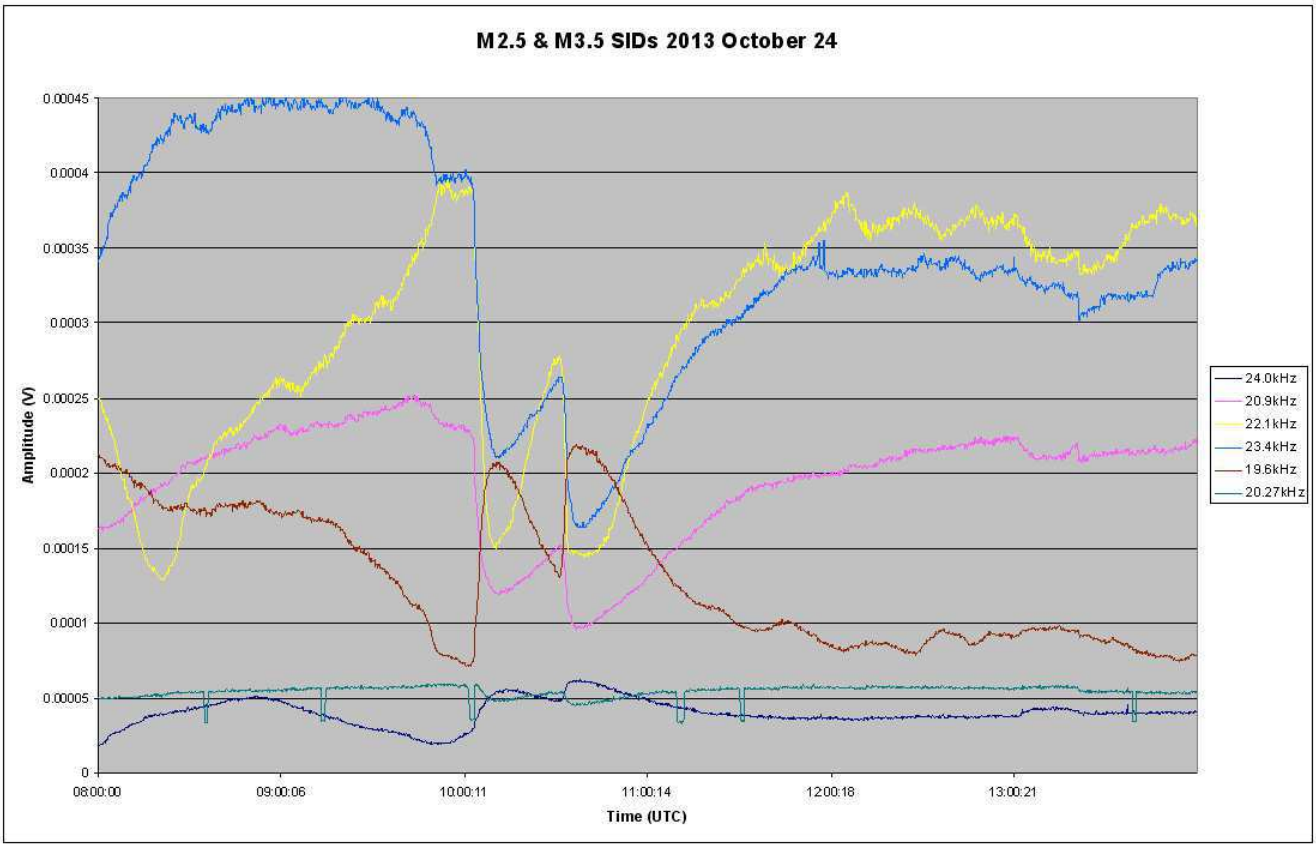
Many of the flares in October were multiple-peaked. Some observers have recorded these as single SIDs, while others have recorded several SIDs for each flare. As far as possible I have recorded all of the times in the tables, showing '?' in the classification for the extra peaks. Those shown as '*' are listed by the SWPC as separate flares, but without giving any X-ray class. Conversely, some flares occurring in rapid succession have become merged into a single SID.



The top chart is from Paul Hyde, showing the M-class flares on the 28th. The top trace (yellow) is at 23.4kHz, and clearly shows the M2.7 and M4.4 flares as separate SIDs, whilst the blue trace at 22.1kHz shows them merged into a single SID. I have added the GOES data to my own recording (lower chart) to show how these two events are almost as one in X-rays too. They were both produced by active region 1882.

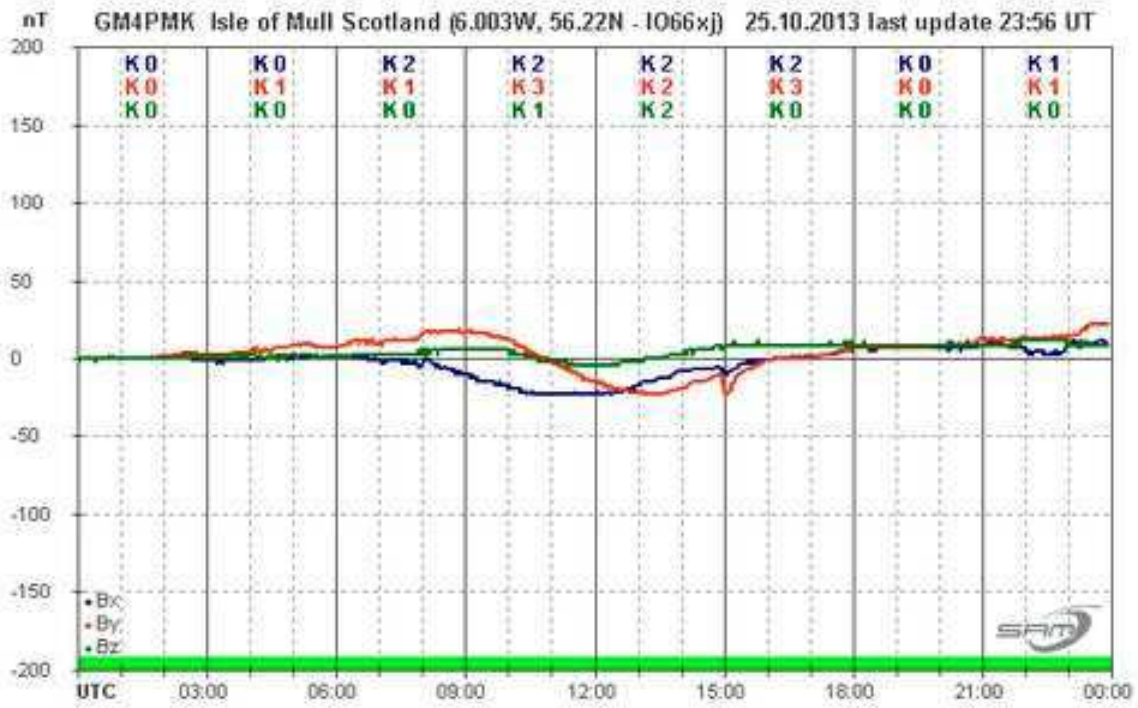
Two flares on the 27th have also become merged into a single SID for some observers. The M3.5 flare peaked at 12:38UT, its decay lasting nearly two hours. This was produced by active region 1875. While the decay was still in progress, region 1877 produced a C4.0 flare peaking at 13:47. Being of much lower amplitude, its effect on the ionosphere was much diluted by the earlier M-class event.

Most of the flares recorded this month have had quite fast rise-times compared to those in recent months. The X1.7 on the 25th is listed by the SWPC at 8 minutes, and the X2.1 at 12 minutes. The M2.5 on the 24th is listed at 10 minutes, while the following M3.5 is listed at just 3 minutes. Mark Edwards' chart on the next page shows these two SIDs.



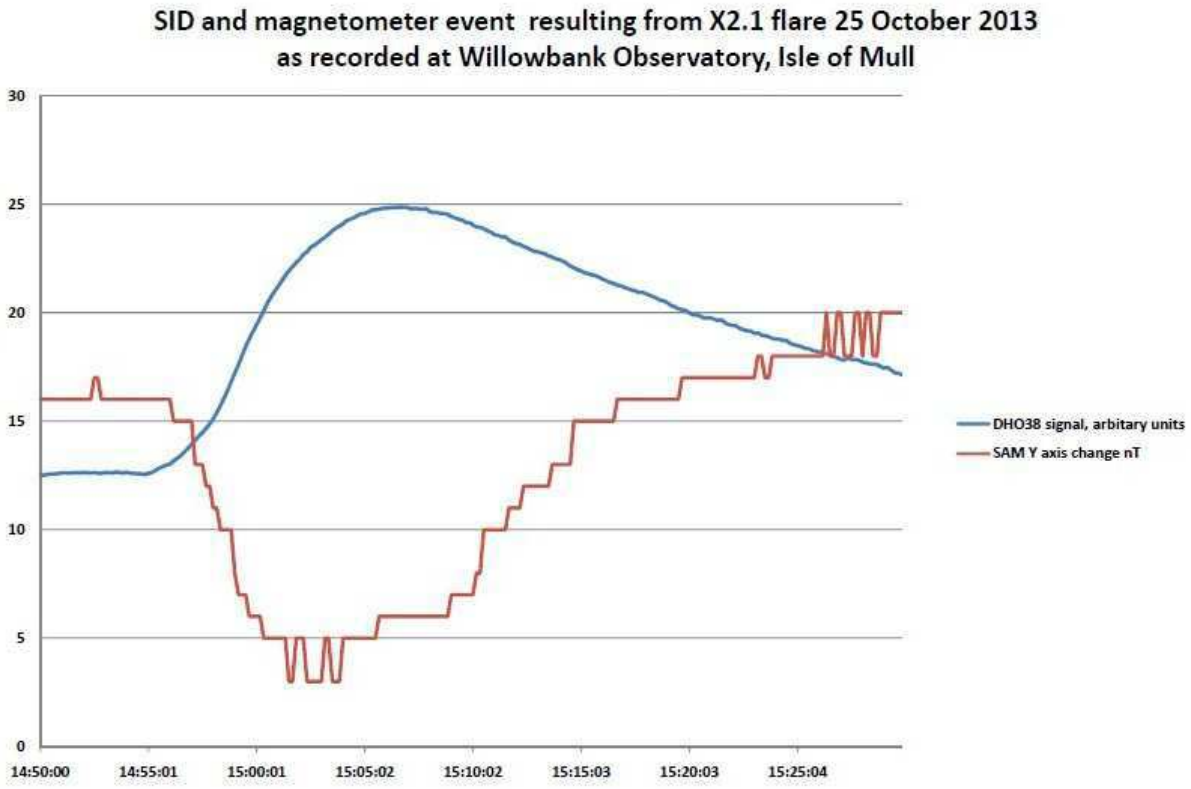
Both of these flares were produced by active region 1875.

MAGNETIC OBSERVATIONS.



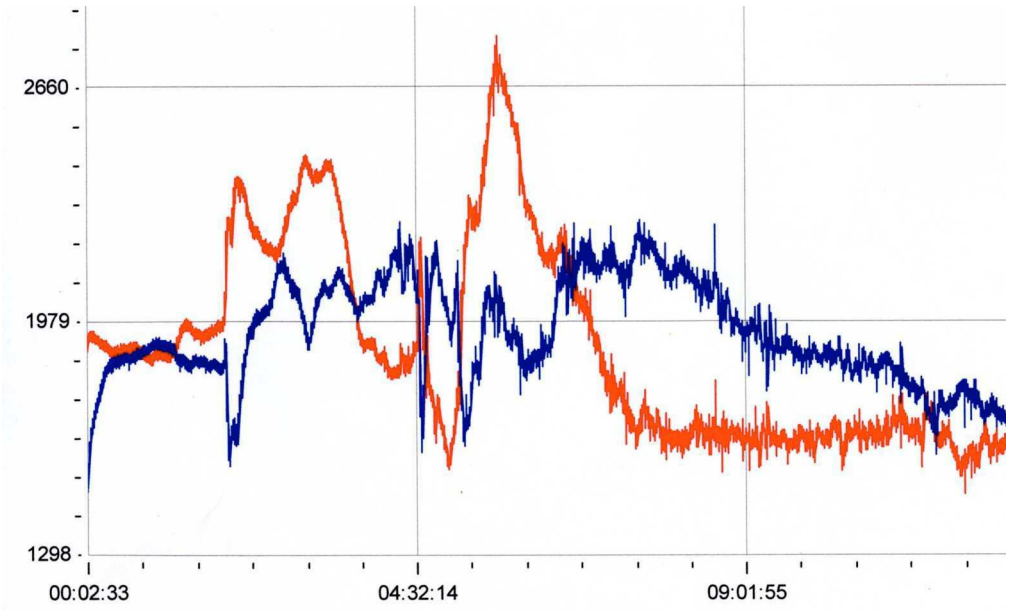
A short rise-time in the X-ray flux is often related to subsequent magnetic disturbances, and this month we have another SFE to add to the Bartels diagram. As already mentioned, the X2.1 flare on the 25th had a fairly rapid onset, and was accompanied by a short magnetic crotchet. The magnetogram above by Roger Blackwell shows the SFE as a sharp dip in the By (red) trace, timed at 15:03UT.

This close-up view by Roger shows both the SFE and SID together:



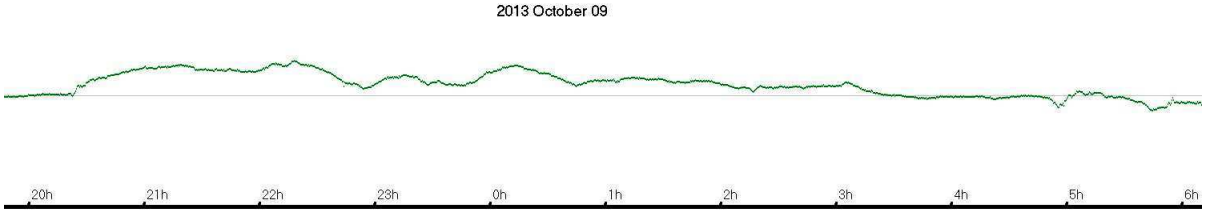
It can also be seen as small fall in the green AMR trace in my earlier SID chart, just after the rise in X-ray flux. The BGS lists two more SFEs, but we have not recorded them.

With the large number of energetic flares in October, the amount of magnetic activity has not been that high. There were plenty of CMEs produced, but mostly aimed away from the Earth and so not having much effect. The best SSC was observed at 01:55UT on the 2nd, shown here recorded by Colin Clements:



Bx is red, and By is blue in this chart. My own recording shows an initial impulse of about 47nT, with a total disturbance of 100nT. The source of the SSC is not clear in the SWPC bulletin, but appears to be from a filament eruption associated with a long duration C1 flare at 23:37UT on September 29th.

Another SSC was recorded at 20:23UT on the 8th.



Although much less dramatic than the earlier SSC, a total disturbance of about 100nT was recorded, the effects lasting nearly until midday on the 9th. The SWPC list this as being due to an Interplanetary magnetic shock, although its source is again not clear.

Magnetic observations received from Roger Blackwell, Colin Clements, John Cook.
Observations to jacook@jacook.plus.com

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	2010 January 1	2 C	3	2092 4	5	6	7	8	9 *	10	11	12	13
2408	F	14	15	16	17	18	19 CCMC	20 MCMCC	21 C	22	23	24	25	26	27	28	29	30	2093 31	2010 February 1	2	3	4	5	6 CC	7	8 MCCMMC	9 C
2409	F	10 CC	11	12 CBM	13 CC	14 C	15 BB	16	17	18	19	20	21	22	23	24	25	26 B	27	2094 28	2010 March 1	2	3	4 C	5	6	7	8
2410	F	9	10	11	12	13	14 B	15	16	17	18	19	20	21	22	23	24	25 BB	26	2095 27 CC	28	29	30	31	2010 April 1	2	3	4
2411	F	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	2096 23	24	25	26	27	28	29	30	May 1
2412	F	2	3	4 C	5 CCM	6	7 C	8 CC	9	10	11	12	13	14	15	16	17	18	19	20	2097 21	22	23	24	25	26	27	28
2413	F	29	30	31	2010 June 1	2	3	4	5	6	7	8	9	10	11	12 C	13 MCCC	14	15	16	2098 17	18	19	20	21	22	23	24
2414	F	25	26	27	28	29	30	2010 July 1	2	3	4	5	6	7	8	9 C	10	11	12	13 C	2099 14 CC	15	16	17 C	18	19	20 C	21
2415	F	22	23 BC	24	25	26	27	28	29	30	2010 August 1 C	2	3	4	5	6	7 M	8	9	2100 10	11	12	13	14 CC	15 C	16 C	17	18 C
2416	F	19	20	21	22	23	24	25	26	27	28	29	30	31	2010 September 1	2	3	4	5	2101 6 C	7	8	9	10	11	12	13	14
2417	F	15	16	17	18	19	20	21	22	23	24	25	26	27	28 C	29	30 B	2010 October 1	2 B	3	2102 4 C	5	6	7	8	9	10	11
2418	F	12	13	14	15	16	17 C	18 CC	19	20	21	22	23	24	25	26	27	28	29	30	2103 31	2010 November 1	2	3 CC	4	5 M	6 CM	7
2419	F	8	9	10	11 C	12 CC	13 C	14	15	16	17	18	19	20	21	22	23	24	25	26	2104 27	28	29	30	2010 December 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	2105 25	26	27	28	29	30	31
2421	F	2011 January 1	2	3	4	5	6	7	8	9	10	11	12	13	14 C	15 C	16	17	18	19	2106 20	21 CCC	22 C	23	24	25	26	27
2422	F	28	29	30	31	2011 February 1	2	3	4 B	5	6	7	8	9	10 CC	11	12 C	13 BCM	14 CM	15 CC	2107 16 MCM	17 CCC	18 MMCC	19 CCC	20	21 CCC	22	23 C
2423	F	24 MCC	25 C	26 C	27	28 MC	2011 March 1 CCC	2 C	3 CC	4 C	5 CCCC	6 CCCC	7 CMMM	8 CMM	9 CMMM	10 CCCC	11 CCC	12 BCCC	13 CC	14 CBCM	15 CCCC	2108 16 CC	17	18	19	20	21 CC	22 C
2424	F	23 BC	24 MCB	25 C	26	27	28 C	29 C	30	31	2011 April 1	2	3	4	5	6 CC	7 C	8	9 C	10	11 BC	2109 12 C	13 CCCC	14 CCCC	15 CCCM	16 CBCC	17 CB	18 B
2425	F	19 B	20 BBC	21 CCC	22 CCMCC	23 CC	24	25 B	26	27	28 CCCC	29	30 CCCC	2011 May 1 CB	2 C	3 C	4	5	6	7	8	2110 9 C	10	11	12 C	13	14	15 C
2426	F	16	17	18 CCC	19	20	21	22	23	24	25	26	27 BCCC	28 CCCM	29 CBCM	30 CCC	31	2011 June 1	2	3	4	5	2111 6	7	8	9	10	11
2427	F	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 C	4	5	6	7	8 CCCC