BAA Radio Astronomy Group. **2011 AUGUST**

			John Cook (23.4kHz/*22.1kHz*)				Roberto Battaiola (23.4kHz)				Andrew Lutley (23.4kHz)				Bob Middlefell (22.1kHz)				Mark Edwards (**22.1**/24.0/*37.5kHz*)			
	Xray class	Observers	Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Tuned radios frequency receiver, 0.5m 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	C4.0	6	*07:29*	*07:38*	*08:06*	*2*													*07:20*	*07:39*	*08:20*	*2+*
1	C1.4	2																				
1	C2.0	8	12:35	12:42	13:07	1+									12:31	12:36		1+	*12:35*	*12:44*	*13:30*	*2+*
1	*	1																				
1	C1.3	1																				
2	**M1.4**	4																	**05:59**	**06:11**	**06:28**	**1+**
2	C2.0	2																	11:39	11:43	12:29	2+
2	C1.1	2																	17:19	17:29	18:07	2+
2	B8.5	1																				
3	**M1.7**	1																				
3	C8.7	8													07:50	07:54		1+	*07:44*	*08:02*	*09:31*	*3*
3	C1.0	1																				
3	*	1																	10:26	10:40	11:17	2+
3	**M6.0**	11	13:23	13:44	15:25	3									13:04	13:18		1	13:21	13:42	14:27	2+
3	C2.3	2																	18:58	19:05	19:22	1
3	C8.5	4																	19:26	19:31	20:17	2+
4	C3.5	7	*08:00*	*08:06*	*08:23*	*1*													*08:01*	*08:07*	*09:00*	*2+*
4	C2.5	8	09:18	09:21	09:50	1+													09:20	09:22	09:58	2
4	C1.6	3																				
4	C1.2	1																				
4	C2.1	8	13:06	13:10	13:18	1-													13:06	13:14	13:53	2+
4	*	1																	*13:20*	*13:21*	*13:28*	*1-*
4	*	1																	*13:34*	*13:37*	*14:11*	*2*
4	C1.0	2																				
4	C1.8	6																	14:36	14:41	15:01	1
5	C1.0	2																				
5	C2.0	8	12:41	12:53	13:15	2													12:43	12:52	13:26	2
5	C1.8	4																	17:45	17:49	18:34	2+
5	C1.4	2																				
5	B8.0	1																				
6	C4.1	9	08:42	08:52	09:18	2													08:42	08:50	09:30	2+
6	C1.3	2																				
6	C1.4	3																	*12:20*	*12:42*	*13:39*	*2+*
6	C1.4	1																				
6	C1.4	1																				
7	C1.6	4																	**08:32**	**08:36**	**08:55**	**1**
7	C2.1	5																	*09:26*	*09:29*	*09:52*	*1+*
7	C1.3	4																	***14:04***	***14:09***	***14:51***	***2+***
8	C2.2	7	16:29	16:30	16:35	1-													16:35	16:38	16:53	1-
8	**M3.5**	8	18:04	18:05	18:32	1+													18:04	18:08	19:13	2+
8	C7.7	1																				
9	**X6.9**	10	*07:46*	*08:05*	*09:03*	*2+*									08:05	08:10		3	*08:01*	*08:07*	*09:47*	*3*
9	C2.2	6	*13:33*	*13:41*	*13:54*	*1*													*13:32*	*13:49*	*14:29*	2+
9	C2.4	8	15:45	15:56	16:06	1													*15:46*	*15:56*	*16:30*	2
9	C2.0	4																	***18:08***	***18:12***	***18:20***	***1-***
10	C2.4	8	09:33	09:40	10:09	2													09:35	09:40	10:13	2
10	C6.1	11	10:32	10:47	11:36	2+									10:27	10:32		2+	10:34	10:47	11:40	2+
10	C1.2	2																				
10	C1.5	5	*15:17*	*15:27*	*15:48*	*1+*													*15:16*	*15:27*	*15:47*	*1+*
11	C1.3	4																	*07:42*	*07:48*	*07:57*	*1-*
11	?	3	09:38	09:49	?	-													09:39	09:47	?	-
11	?	2	09:58	10:08	?	-													09:57	10:09	?	-
11	C6.2	8	10:16	10:23	11:30	2+													10:15	10:25	11:23	2+
12	B3.6	1																	12:32	13:14	13:37	2+
15	C3.4	9	11:14	11:24	11:56	2													*11:16*	*11:24*	*12:26*	*2+*
15	B8.6	1																				
17	C3.4	7	10:27	10:41	11:28	2+													10:28	10:47	11:45	2+
17	C2.6	6																	16:21	16:38	17:24	2+
18	B9.7	1																	13:08	13:19	13:44	2
18	C1.1	2																	15:12	15:13	15:37	1
20	B5.7	1																	11:59	12:03	12:13	1-
20	B8.4	2																	12:31	12:34	12:49	1-
21	B6.1	1																				
21	B5.9	1																	16:14	16:24	16:50	2
21	*	1																	17:31	17:34	17:59	1+
21	C1.5	2																	18:20	18:40	19:18	2+
22	C1.1	2																	15:46	15:53	16:52	2+
24	C1.1	2																	16:34	16:36	17:11	2
25	B9.6	1																	16:47	16:54	17:20	2
26	C2.3	2																	13:09	13:17	14:01	2+
29	C3.7	5	07:09	07:13	?	-													*07:16*	*07:22*	*07:46*	*1+*
29	?	1																	10:38	10:45	?	-
29	?	1																	10:57	11:09	?	-
29	C2.9	4																	11:15	11:25	12:22	2+
29	?	1																	14:25	14:34	14:53	1+
29	?	1																	15:24	15:36	15:43	1
29	C1.1	1																	15:59	16:04	16:27	1+
30	C1.5	5					06:35	06:45	06:52	1-									***06:39***	***06:48***	***06:59***	***1***
30	B8.8	2																	09:20	09:27	09:51	1+
30	*	1																				
30	B7.5	1																	11:59	12:15	13:10	2+
30	C1.5	5	13:51	13:59	14:30	2	13:49	13:59	14:32	2									13:52	14:00	15:14	2+
30	*	1																				
31	C2.2	5	11:20	11:26	11:50	1+													11:22	11:29	12:31	2+

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			Colin Clements (23.4kHz/*37.5kHz*)				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.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C4.0														07:30	07:40	08:13	2				
1	C1.4																		08:10	08:15	08:18	1-
1	C2.0														12:35	12:43	13:00	1	12:35	12:40	12:45	1-
1	*										13:40	13:42	13:56	1-								
1	C1.3																		16:50	17:05	17:10	1
2	**M1.4**														06:09	06:21	07:08	2+	11:35	11:40	11:44	1-
2	C2.0																					
2	C1.1																					
2	B8.5																					
3	**M1.7**																					
3	C8.7		07:56	08:02	08:29	2									07:44	07:59	08:45	2+	07:40	08:00	08:07	1+
3	C1.0																					
3	*																					
3	**M6.0**		13:09	13:43	15:41	3+									13:19	13:51	15:00	3	13:17	13:50	14:10	2+
3	C2.3																		18:52	19:00	19:05	1-
3	C8.5		19:29	19:33	19:42	1-									19:24	19:32	19:40	1-				
4	C3.5		*07:59*	*08:08*	*08:28*	*1+*									08:01	08:07	08:30	1+				
4	C2.5		09:19	09:26	10:05	2+									09:18	09:21	09:31	1-	09:15	09:20	09:25	1-
4	C1.6														10:06	10:15	10:23	1-	10:05	10:13	10:20	1-
4	C1.2																		11:44	11:50	11:55	1-
4	C2.1		13:06	13:10	13:33	1+									13:05	13:11	13:18	1-	13:05	13:08	13:13	1-
4	*																					
4	*																					
4	C1.0										14:06	14:08	14:34	1+					14:10	14:18	14:25	1-
4	C1.8		*14:36*	*14:41*	*15:13*	*2*									14:35	14:40	14:51	1-	14:30	14:40	14:45	1-
5	C1.0																		10:25	10:30	10:38	1-
5	C2.0		12:41	12:52	13:09	1+									12:40	12:49	13:34	2+	12:40	12:39	12:45	1-
5	C1.8																		17:40	17:48	17:55	1-
5	C1.4																		19:40	19:45	19:50	1-
5	B8.0																					
6	C4.1		*08:42*	*08:51*	*09:26*	*2*									08:41	08:50	09:05	1	08:38	08:47	08:50	1-
6	C1.3														11:43	11:58	12:10	1+	11:40	11:45	11:55	1-
6	C1.4														12:17	12:27	12:30	1-	12:15	12:25	12:30	1-
6	C1.4																		16:55	18:05	18:40	3
6	C1.4																		19:20	19:25	19:30	1-
7	C1.6																		08:25	08:30	08:38	1-
7	C2.1														09:25	09:30	09:48	1	09:25	09:28	09:30	1-
7	C1.3														14:01	14:09	14:18	1-	14:00	14:05	14:10	1-
8	C2.2														16:34	16:38	16:53	1	16:30	16:35	16:40	1-
8	**M3.5**		18:07	18:10	18:54	2+									18:03	18:11	19:14	2+	18:00	18:10	18:20	1
8	C7.7																					
9	**X6.9**														07:54	08:03	10:00	3+	07:49	08:05	08:10	1
9	C2.2														13:33	13:45	14:05	1+	13:30	13:45	13:58	1+
9	C2.4										15:56	15:58	16:52	2+	15:51	15:58	16:14	1	15:45	15:55	16:05	1
9	C2.0														18:12	18:25	18:33	1	18:05	18:10	18:44	2
10	C2.4														09:33	09:40	09:54	1	09:30	09:38	09:45	1-
10	C6.1		10:34	10:47	11:56	2+									10:32	10:43	11:30	2+	10:20	10:45	10:55	2
10	C1.2																		14:05	14:10	14:12	1-
10	C1.5														15:17	15:28	15:42	1	14:50	15:25	15:40	2+
11	C1.3														07:42	07:50	07:57	1-				
11	?														09:37	09:46	09:56	1				
11	?																					
11	C6.2		09:38	10:22	11:37	3									09:56	10:06	10:40	2	09:35	10:23	10:35	2+
12	B3.6																					
15	C3.4		11:14	11:24	11:47	2									11:15	11:25	12:00	2	11:10	11:20	11:35	1
15	B8.6														14:00	14:18	14:32	1+				
17	C3.4														10:26	10:43	11:20	2+	10:20	10:45	11:10	2+
17	C2.6														16:19	16:32	16:49	1+	16:15	16:30	16:45	1+
18	B9.7																					
18	C1.1																		15:00	15:15	15:30	1+
20	B5.7																					
20	B8.4																					
21	B6.1																					
21	B5.9																					
21	*																					
21	C1.5														18:23	18:44	18:52	1+				
22	C1.1																					
24	C1.1																		16:30	16:33	16:35	1-
25	B9.6																					
26	C2.3														13:10	13:19	13:31	1				
29	C3.7														07:08	07:24	08:13	2+				
29	?																					
29	?																					
29	C2.9														11:30	11:38	11:46	1-				
29	?																					
29	?																					
29	C1.1																					
30	C1.5														13:51	14:00	14:31	2				
30	B8.8																					
30	*																		10:15	11:20	11:50	3
30	B7.5																					
30	C1.5																					
30	*																		15:55	16:00	16:05	1-
31	C2.2														11:19	11:29	11:57	2				

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			Paul Hyde (22.1kHz)				Gordon Fiander (23.4kHz)				John Elliott (21.7kHz)				Martyn Kinder (19.6kHz/*22.1khz*)				Mark Horn (23.4kHz)			
			Tuned radio frequency receiver, 0.96m frame aerial.				PC sound card.				Tuned radio frequency receiver, 0.5m frame aerial.				Tuned radio frequency receiver, 0.58m frame aerial.				Tuned radio frequency receiver, 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)	
1	C4.0		07:27	07:37	?	-									*07:30*	*07:36*	*07:46*	*1-*				
1	C1.4		08:11	08:14	?	-																
1	C2.0		12:34	12:40	13:30	2+									12:35	12:39	12:50	1-				
1	*																					
1	C1.3																					
2	**M1.4**														*05:15*	*?*	*?*	-				
2	C2.0														11:38	11:41	11:46	1-				
2	C1.1														17:17	17:23	17:35	1-				
2	B8.5														*19:31*	*19:33*	*19:36*	*1-*				
3	**M1.7**		04:30	04:37	?	-																
3	C8.7		07:42	08:00	08:48	2+									07:42	07:58	08:38	2+				
3	C1.0														*10:01*	*10:03*	*10:06*	*1-*				
3	*																					
3	**M6.0**		13:19	13:42	15:25	3+					13:20	13:41	15:30	3+	13:20	13:40	14:38	2+				
3	C2.3																					
3	C8.5														19:25	19:31	19:44	1				
4	C3.5		07:58	08:06	08:39	2									07:57	08:06	08:13	1-				
4	C2.5		09:17	09:20	09:35	1-									09:17	09:21	09:26	1-				
4	C1.6														*10:07*	*10:17*	*10:25*	*1-*				
4	C1.2																					
4	C2.1		13:04	13:09	13:54	2+									*13:06*	*13:08*	*13:20*	*1-*				
4	*																					
4	*																					
4	C1.0																					
4	C1.8		14:33	14:40	15:03	1+									*14:33*	*14:39*	*14:47*	*1-*				
5	C1.0														*10:25*	*10:30*	*10:34*	*1-*				
5	C2.0		12:40	12:46	13:29	2+									12:40	12:45	12:57	1-				
5	C1.8		17:40	17:47	?	-									17:41	17:48	17:56	1-				
5	C1.4																					
5	B8.0																					
6	C4.1		08:39	08:47	09:01	1									08:36	08:50	09:15	2				
6	C1.3																					
6	C1.4																					
6	C1.4																					
6	C1.4																					
7	C1.6		08:29	08:35	08:49	1									08:24	08:31	08:39	1-				
7	C2.1		09:26	09:28	09:37	1-									09:24	09:27	09:32	1-				
7	C1.3														14:04	14:08	14:17	1-				
8	C2.2		16:34	16:38	16:53	1									16:30	16:37	16:50	1				
8	**M3.5**		18:05	18:14	19:07	2+									18:04	18:12	18:32	1+				
8	C7.7																					
9	**X6.9**		07:51	08:05	10:14	3+					08:10	08:13	09:28	2+	07:51	08:03	08:11	1				
9	C2.2		13:32	13:47	14:11	2									13:29	13:46	14:04	2				
9	C2.4		15:46	15:57	16:54	2+									15:46	15:55	16:22	2				
9	C2.0		18:07	18:13	18:28	1																
10	C2.4		09:34	09:39	09:56	1									09:32	09:38	09:52	1				
10	C6.1		10:30	10:46	11:33	2+					10:31	10:41	11:35	2+	10:30	10:36	10:43	1-				
10	C1.2														14:06	14:10	14:24	1-				
10	C1.5		15:17	15:28	16:01	2																
11	C1.3		07:42	07:50	08:23	2									07:41	07:47	07:54	1-				
11	?																					
11	?																					
11	C6.2		09:38	09:46	11:25	3									09:36	09:57	10:21	2				
12	B3.6																					
15	C3.4		11:13	11:23	11:55	2									11:12	11:21	11:33	1				
15	B8.6																					
17	C3.4		10:24	10:44	11:31	2+									10:20	10:35	10:50	1+				
17	C2.6		16:19	16:32	16:54	2									16:17	16:30	16:50	2				
18	B9.7																					
18	C1.1																					
20	B5.7																					
20	B8.4														12:20	12:20	12:49	1+				
21	B6.1																					
21	B5.9																					
21	*																					
21	C1.5																					
22	C1.1																					
24	C1.1																					
25	B9.6																					
26	C2.3																					
29	C3.7		07:09	07:21	08:03	2+									07:09	07:23	07:49	2				
29	?																					
29	?																					
29	C2.9																					
29	?																					
29	?																					
29	C1.1																					
30	C1.5		06:36	06:41	?	-									06:36	06:40	06:56	1				
30	B8.8														09:17	09:23	09:32	1-				
30	*																					
30	B7.5																					
30	C1.5		13:50	13:58	14:34	2									13:49	13:58	14:27	2				
30	*																					
31	C2.2		11:20	11:25	11:48	1+									11:17	11:24	11:34	1-				

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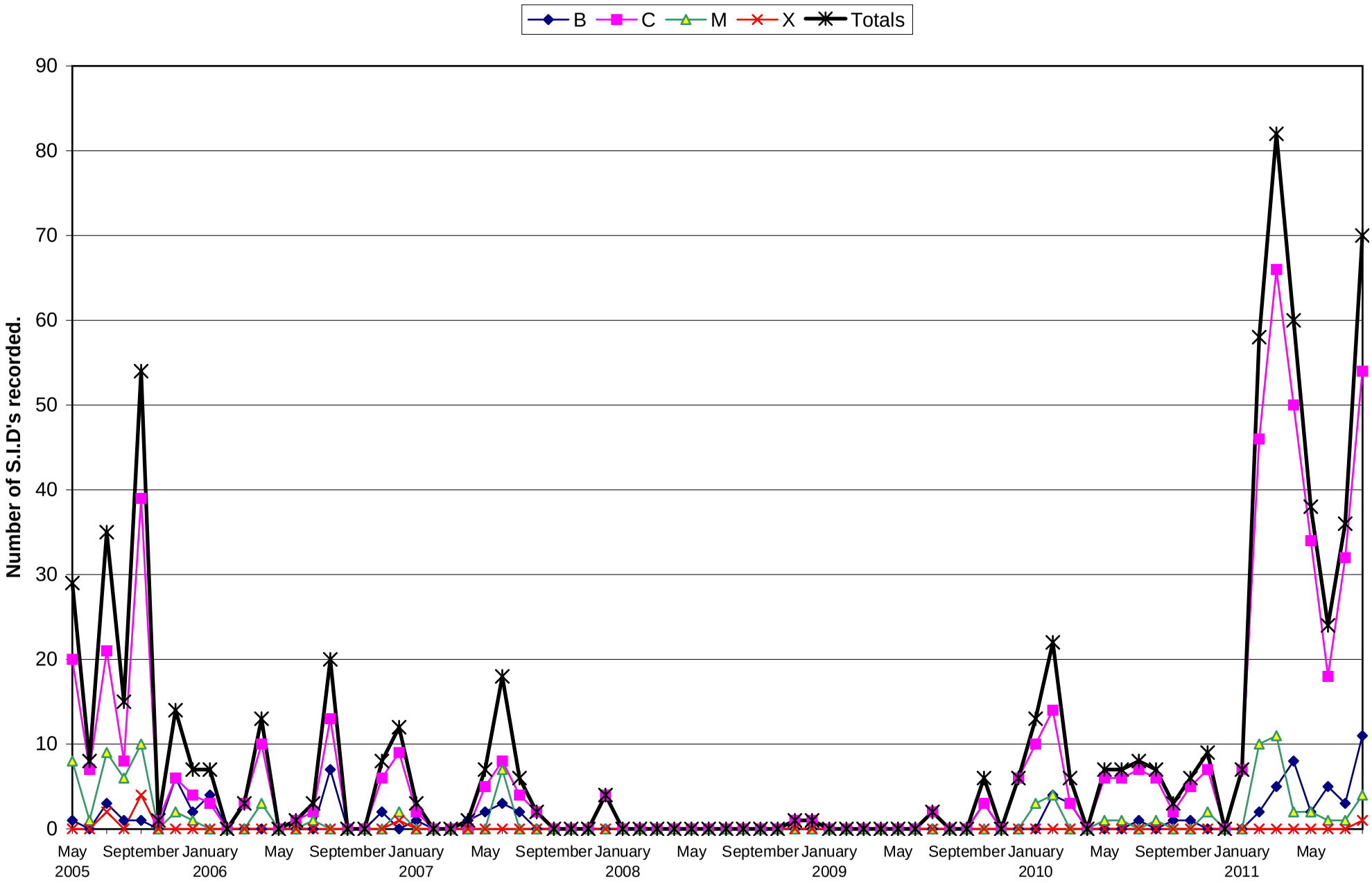
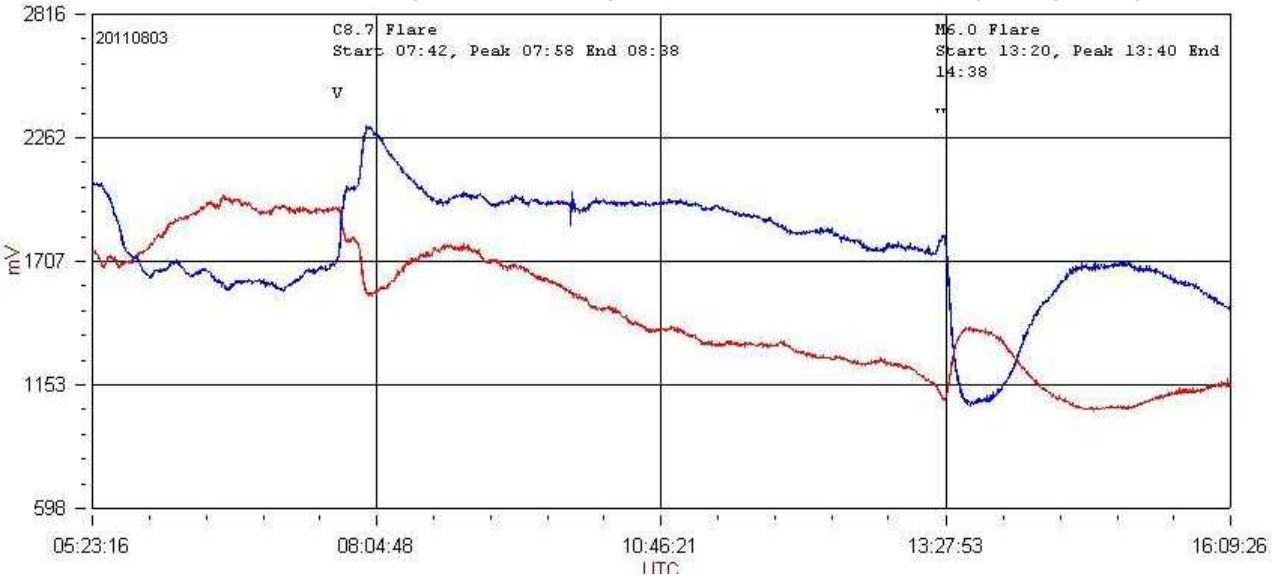
			Steve Parkinson (23.4kHz)				Simon Dawes (various)				Gonzalo Vargas (Various)							
			Tuned radio frequency receiver, 0.58m frame aerial.				PC soundcard and TRF receiver with 1m loop aerial.				Spectrum Lab.							
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C4.0						07:16	07:32	08:01	2								
1	C1.4																	
1	C2.0		12:39	12:43	13:00	1												
1	*																	
1	C1.3																	
2	**M1.4**																	
2	C2.0																	
2	C1.1																	
2	B8.5																	
3	**M1.7**																	
3	C8.7						07:48	07:56	08:33	2								
3	C1.0																	
3	*																	
3	**M6.0**		13:27	13:51	15:24	3	13:18	13:36	15:52	3+								
3	C2.3																	
3	C8.5																	
4	C3.5						07:55	08:00	08:12	1-								
4	C2.5						09:13	09:17	09:27	1-								
4	C1.6																	
4	C1.2																	
4	C2.1										13:09	13:10	13:16	1-				
4	*																	
4	*****																	
4	C1.0																	
4	C1.8																	
5	C1.0																	
5	C2.0		12:45	12:48	?	-												
5	C1.8																	
5	C1.4										19:23	19:26	19:35	1-				
5	B8.0										21:17	21:18	21:29	1-				
6	C4.1		08:45	08:57	?	-	08:33	08:43	09:03	1+								
6	C1.3																	
6	C1.4																	
6	C1.4																	
6	C1.4																	
7	C1.6																	
7	C2.1																	
7	C1.3																	
8	C2.2										16:25	16:26	16:37	1-				
8	**M3.5**						18:09	18:15	18:48	2								
8	C7.7										22:12	22:13	22:19	1-				
9	**X6.9**		08:06	08:16	09:54	3	07:56	07:59	08:39	2								
9	C2.2																	
9	C2.4						15:38	15:49	16:26	2+								
9	C2.0																	
10	C2.4		09:30	09:42	09:54	1	09:26	09:33	09:49	1								
10	C6.1		10:36	10:46	11:48	2+	10:28	10:34	11:08	2								
10	C1.2																	
10	C1.5																	
11	C1.3																	
11	?																	
11	?																	
11	C6.2		09:45	10:24	11:50	3												
12	B3.6																	
15	C3.4		11:18	11:27	11:48	1+	11:04	11:13	11:42	2								
15	B8.6																	
17	C3.4		10:27	10:45	11:36	2+												
17	C2.6										16:26	16:27	16:34	1-				
18	B9.7																	
18	C1.1																	
20	B5.7																	
20	B8.4																	
21	B6.1										12:28	12:29	12:36	1-				
21	B5.9																	
21	*																	
21	C1.5																	
22	C1.1										16:18	16:19	16:25	1-				
24	C1.1																	
25	B9.6																	
26	C2.3																	
29	C3.7																	
29	?																	
29	?																	
29	C2.9		11:00	11:08	12:24	2+					11:52	11:53	11:57	1-				
29	?																	
29	?																	
29	C1.1																	
30	C1.5																	
30	B8.8																	
30	*																	
30	B7.5																	
30	C1.5																	
30	*																	
31	C2.2																	

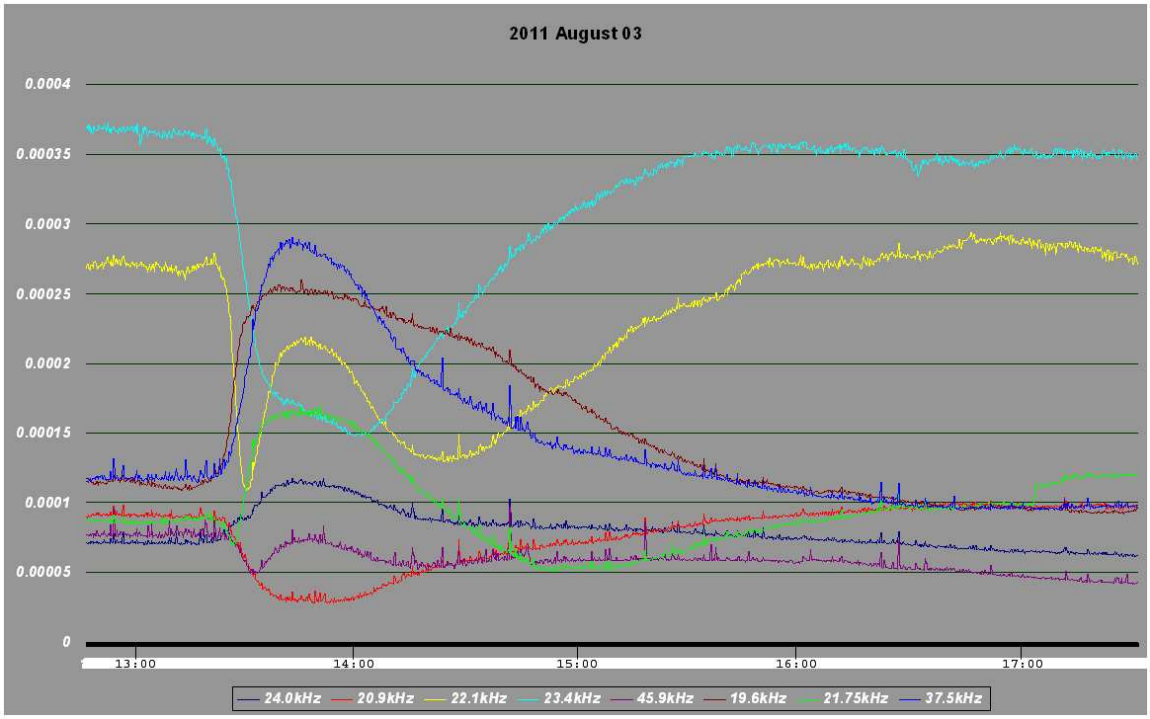

VLF flare activity 2005/11.
B
C
M
X
Totals
Number of S.I.D's recorded.
90
80
70
60
50
40
30
20
10
0
May 2005
September
January 2006
May
September
January 2007
May
September
January 2008
May
September
January 2009
May
September
January 2010
May
September
January 2011
May

2011 AUGUST

This month has seen the first X-class flare recorded by the group since 2006 December 5th. There was an X2.2 flare on 2011 February 15th, but at 01:56UT it was not recorded. There is also a bumper crop of C and M-class events, with 11 B-class recorded as well.

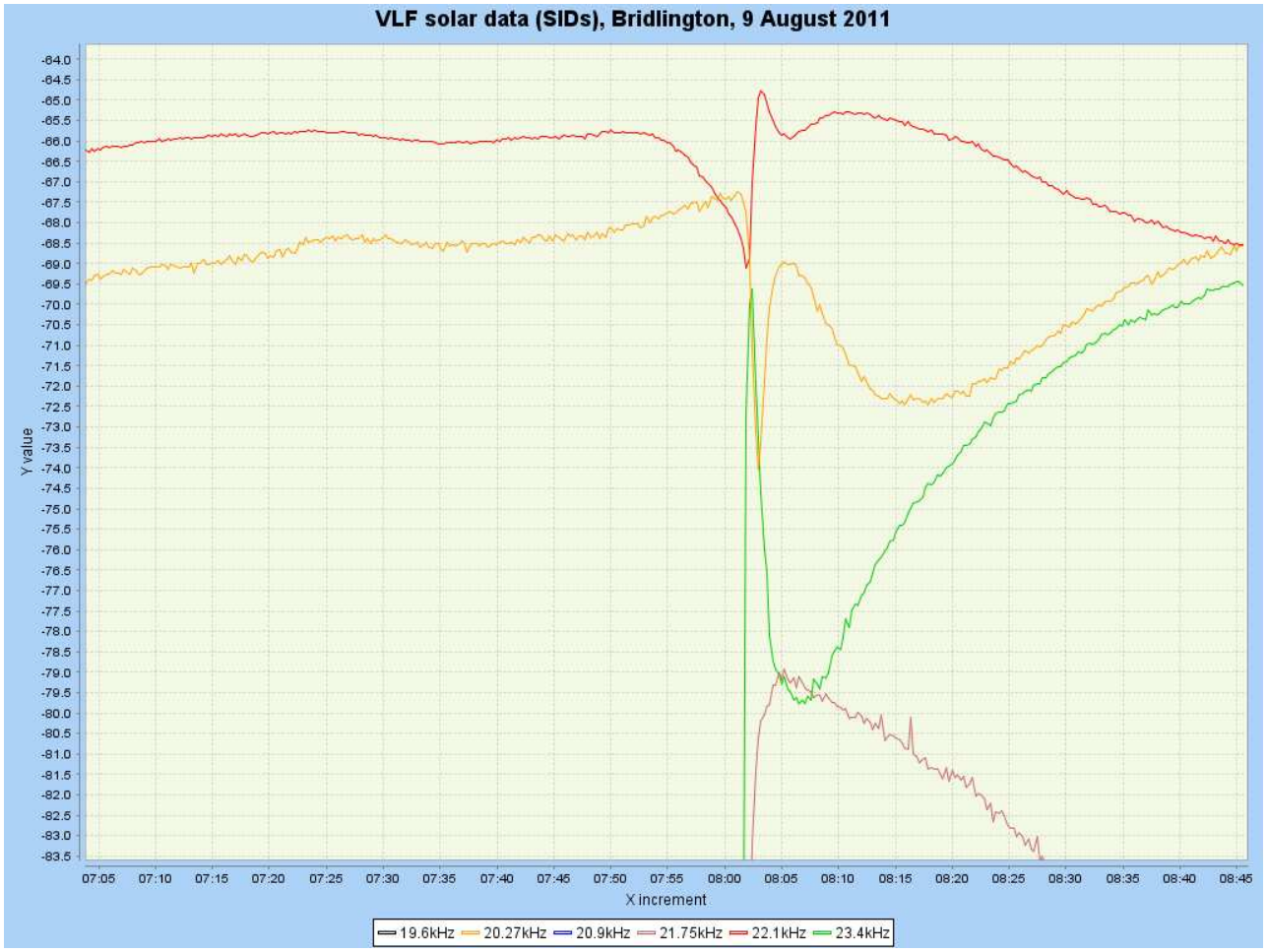
An M6.0 flare on the 3rd produced a very clear SID, as shown in this plot by Martyn Kinder:



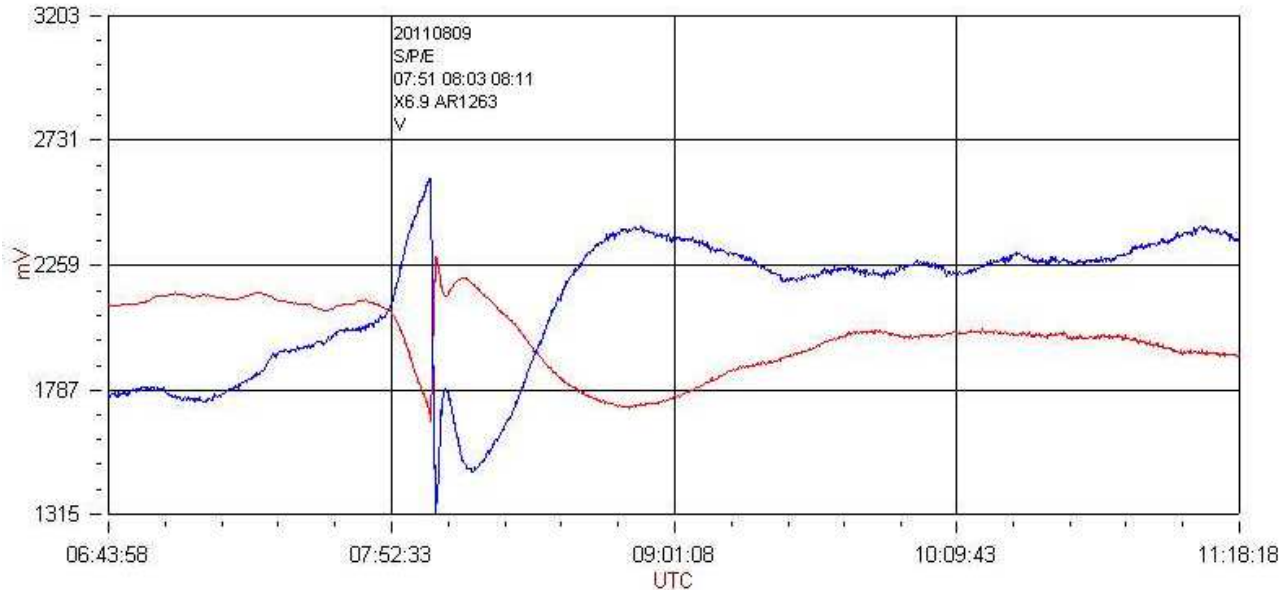


Mark Edwards also included this plot of the event, as recorded with spectrum lab software.

The start of the X6.9 flare on the 9th occurred just before the 23.4kHz signal re-appeared after its usual morning break. The SID was typical of those produced by energetic solar flares, in that the ground/sky wave interference pattern shifted a peak and trough over observers. The effect is shown in the recording made by John Wardle:

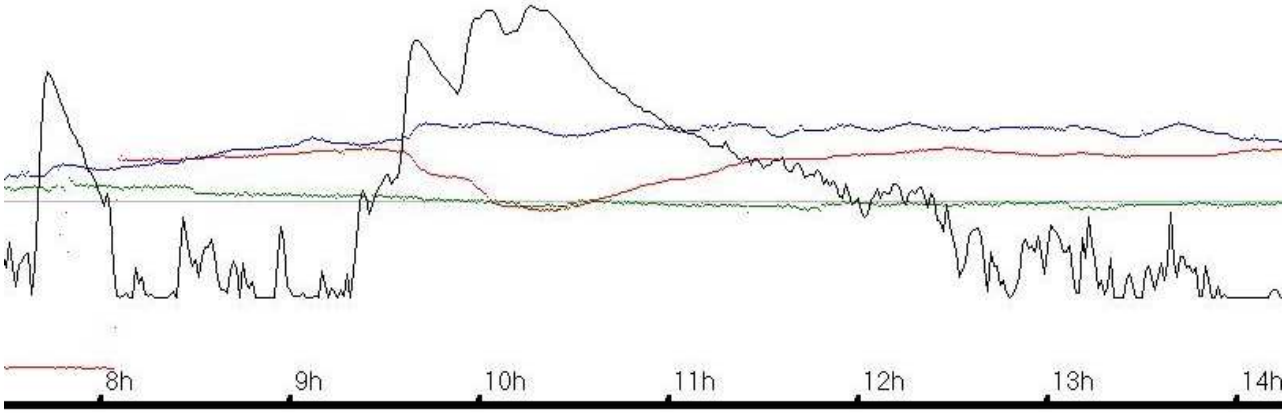


John is using the Starbase system for controlling his receivers and logging the results. The 'spike and wave' SID makes timing the event difficult, although thinking of the moving interference pattern helps. Martyn Kinder also sent a plot of this event:

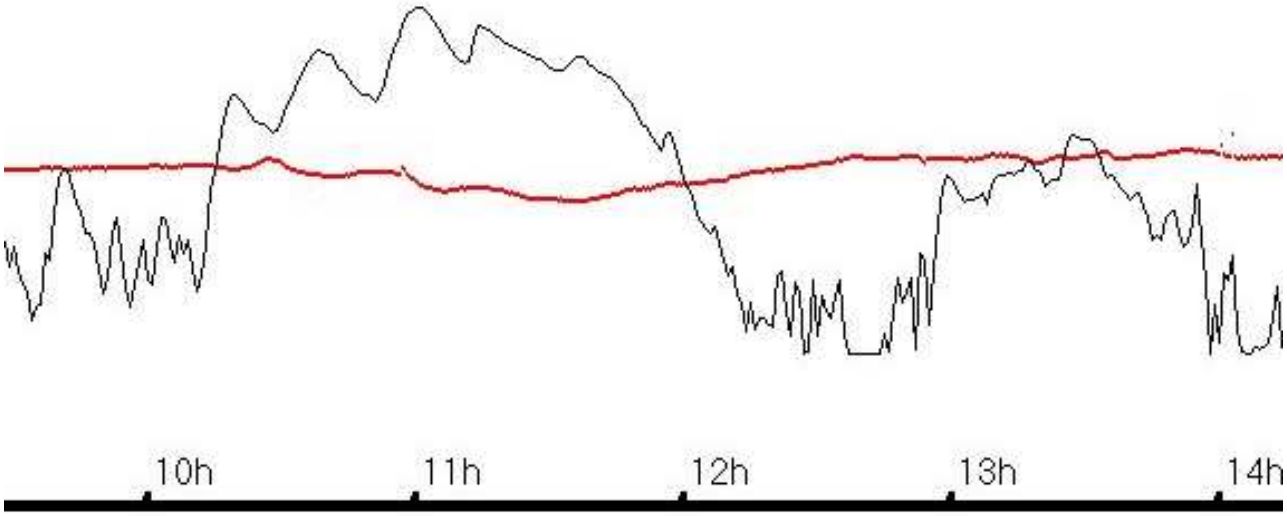


The C6.1 flare on the 11th was much smaller, but created a more complex SID. The background X-ray flux was already at a fairly high level by 09:30UT when the first of 3 peaks

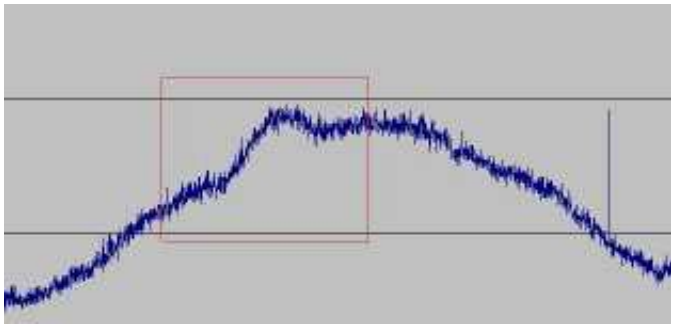
occurred. Two further peaks followed before the flux returned to lower levels again. My own recording shows 3 SIDs (red is 23.4kHz, blue is 22.1kHz):



The GOES data has been added in black to help clarify events. I have listed all 3 peaks in the activity summary to include all of the timings received, although he activity chart includes it as just a single flare.



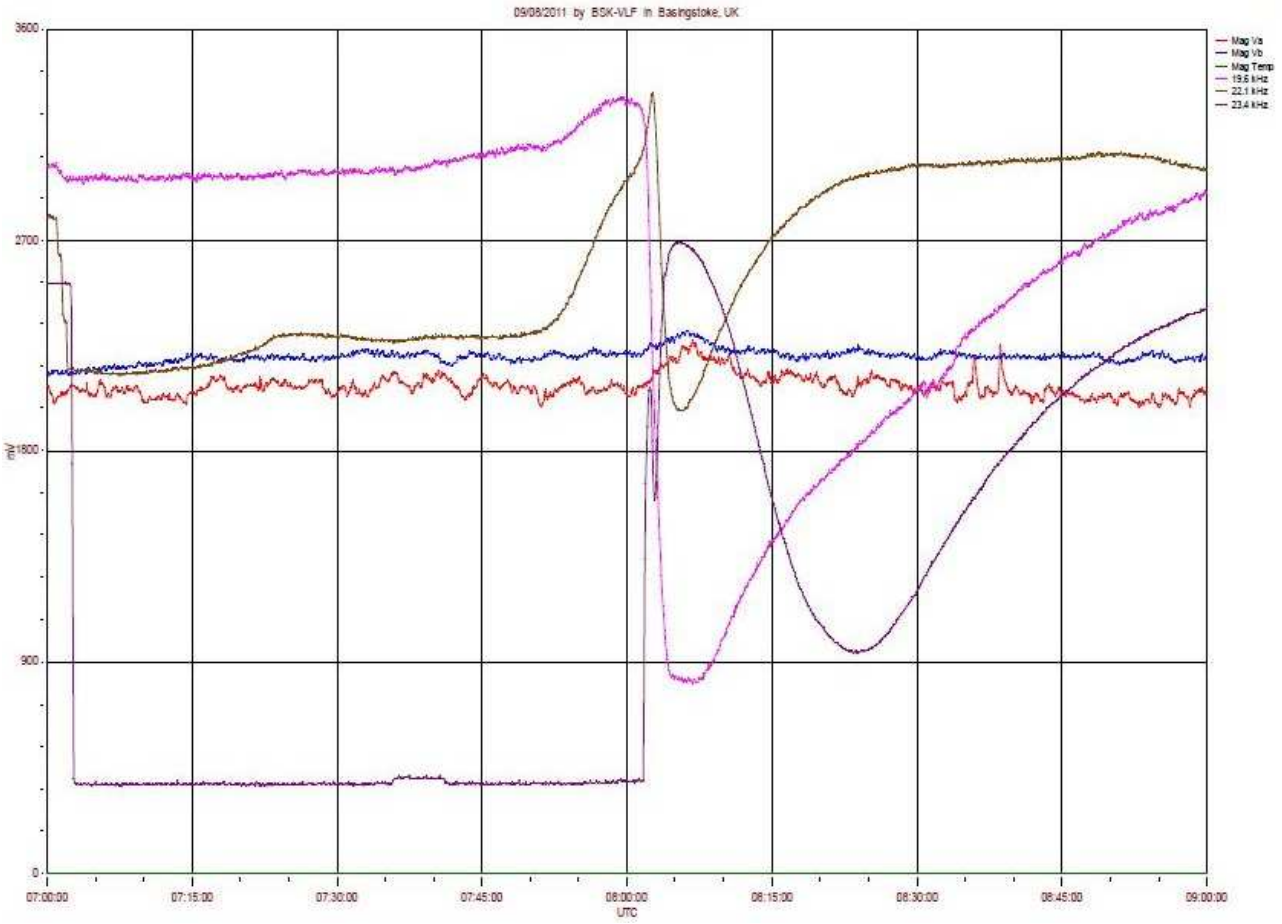
August 29th produced more similar events, shown above. At C2.9, I have barely recorded an identifiable SID for any of the six peaks shown in the GOES X-ray flux.



Mark Edwards noted that his signal at 24.0kHz was responding to some fairly weak B-class flares. The B3.6 on the 12th is probably the weakest recorded by the group so far, but evidence is provided in his recording shown above.

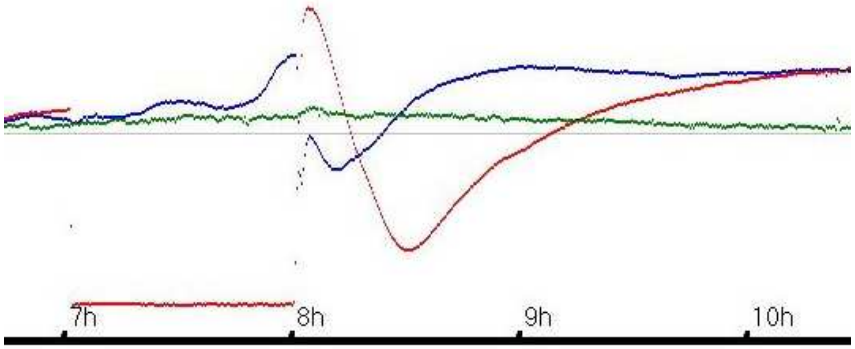
Magnetic Data

The SID from the X6.9 flare on the 9th was accompanied by a sudden flare event, or SFE. This is a magnetic disturbance occurring at the same time as the SID, due to the flare. Normally, the solar magnetic field associated with the flare would travel through space with its plasma at a much slower speed than the X-ray photons causing the SID. However, the large disturbance to the ionosphere will alter the large currents flowing in this region. The effect is that of a motor where a moving electric field (the ionosphere) will cause a changing magnetic field. This interacts with the Earth's own magnetic field to give a small disturbance. The effect is not always seen, but the chart from Paul Hyde shows it quite well:

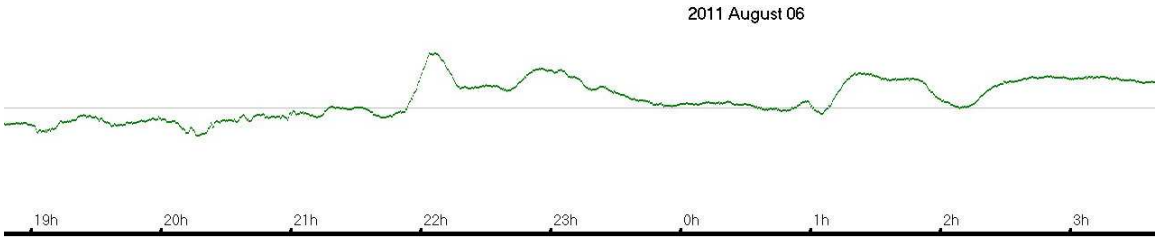


This sort of connection has been recorded previously by the Radio Group, but has so far remained unidentified. Paul drew my attention to it, and I found that I have very similar results. In Paul's chart, the brown and pink traces are the VLF SID, the red and blue traces being the two magnetic components. A small increase in both magnetic components can be seen, peaking around the maximum point of the SID. This is the time of maximum ionospheric disturbance, and thus also maximum magnetic disturbance from the moving electric current.

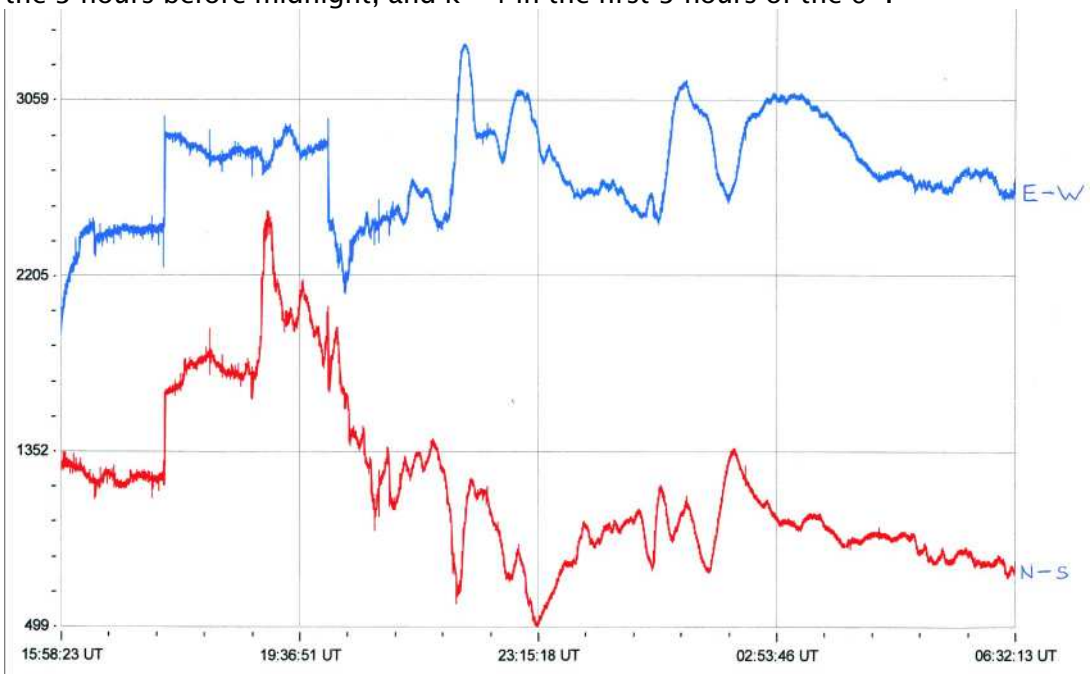
We will be keeping an eye open for similar events during solar cycle 24, so please send in any recordings of SFE candidates that you find. My own chart is on the next page, green being the magnetic signal, blue 22.1kHz.



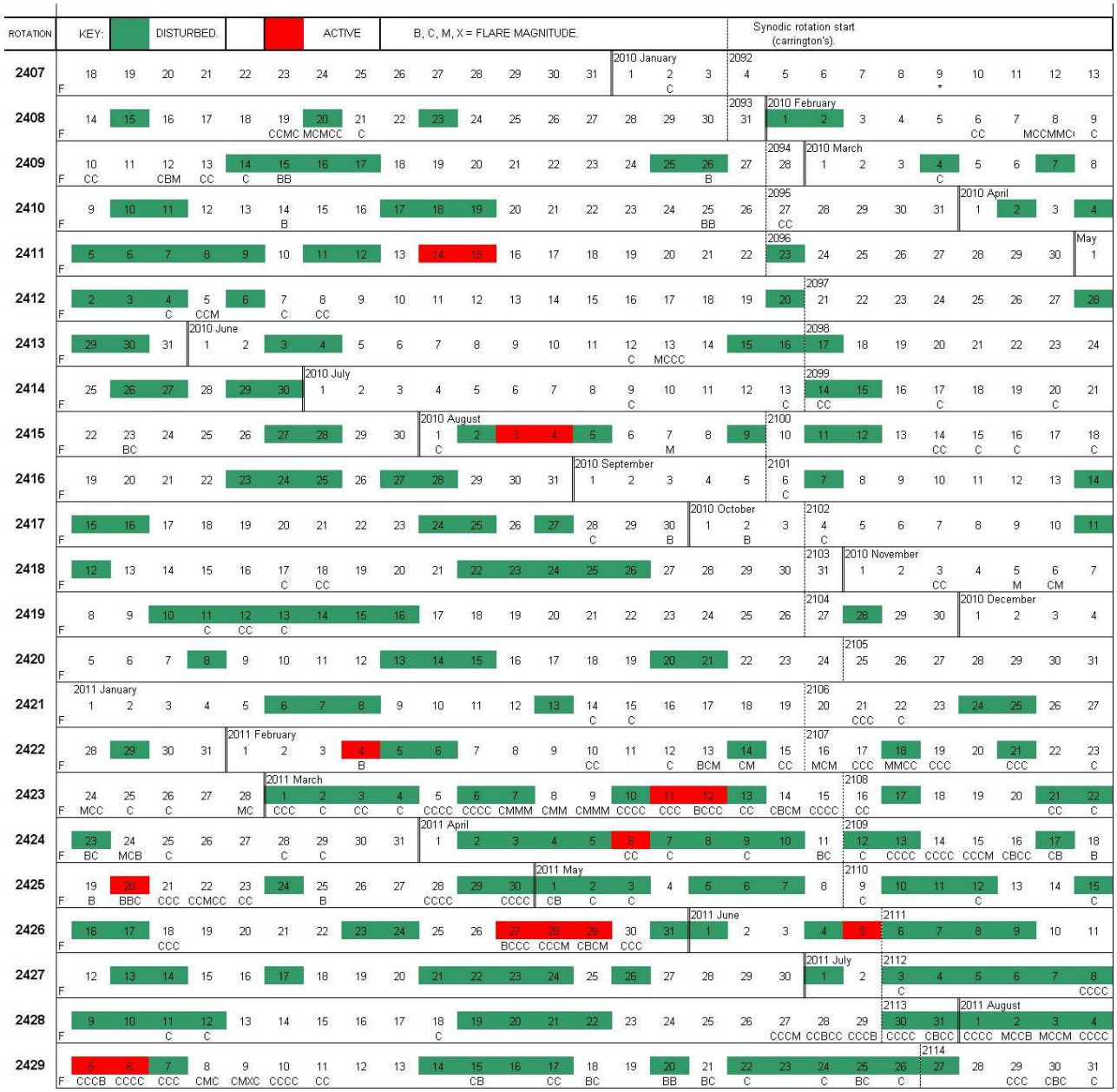
The vertical scale of my plot is rather compressed compared to Paul's, but the bump in the green magnetometer trace is clear enough. The active period shown on the 5th was a result of a CME produced by an M9.3 flare at 04UT in the 4th, and thus not shown in this summary. The remaining disturbances were due to coronal hole high-speed streams, mostly returning after a complete solar rotation.



My magnetic recording of the CME arrival on the 5th/6th is shown above. I estimate a k-index of 5 in the 3 hours before midnight, and k =4 in the first 3 hours of the 6th.



The recording by Colin Clements, above, shows good agreement in the East-west (blue) component, despite some local disturbance from about 16:15 to 20:00.



Magnetic data from Paul Hyde, Colin Clements, Gonzalo Vargas & John Cook.

Radio Astronomy Group General Meeting.

We will be holding a Radio Group meeting on Saturday, November 12th, in Northampton. All are invited to attend. There will be two professional speakers, talking about UK involvement in the square kilometer array and the LOFAR telescopes. Radio group members will be talking about various radio sources, software defined radio for the amateur, magnetic and solar observations, etc. There will be a charge of £12 for BAA members (£15 non-members) to include lunch, tea and coffee, or £7 (£10 non-members) without lunch. Full details will be found shortly at www.britastro.org/radio Early booking is advised, so that we can gauge seating arrangements, etc. Previous meetings have been well received. I look forward to the opportunity to see some of you there. The venue (Humfrey rooms, Castilian Terrace) is close to the town centre, and 10 minutes walk from the railway station.