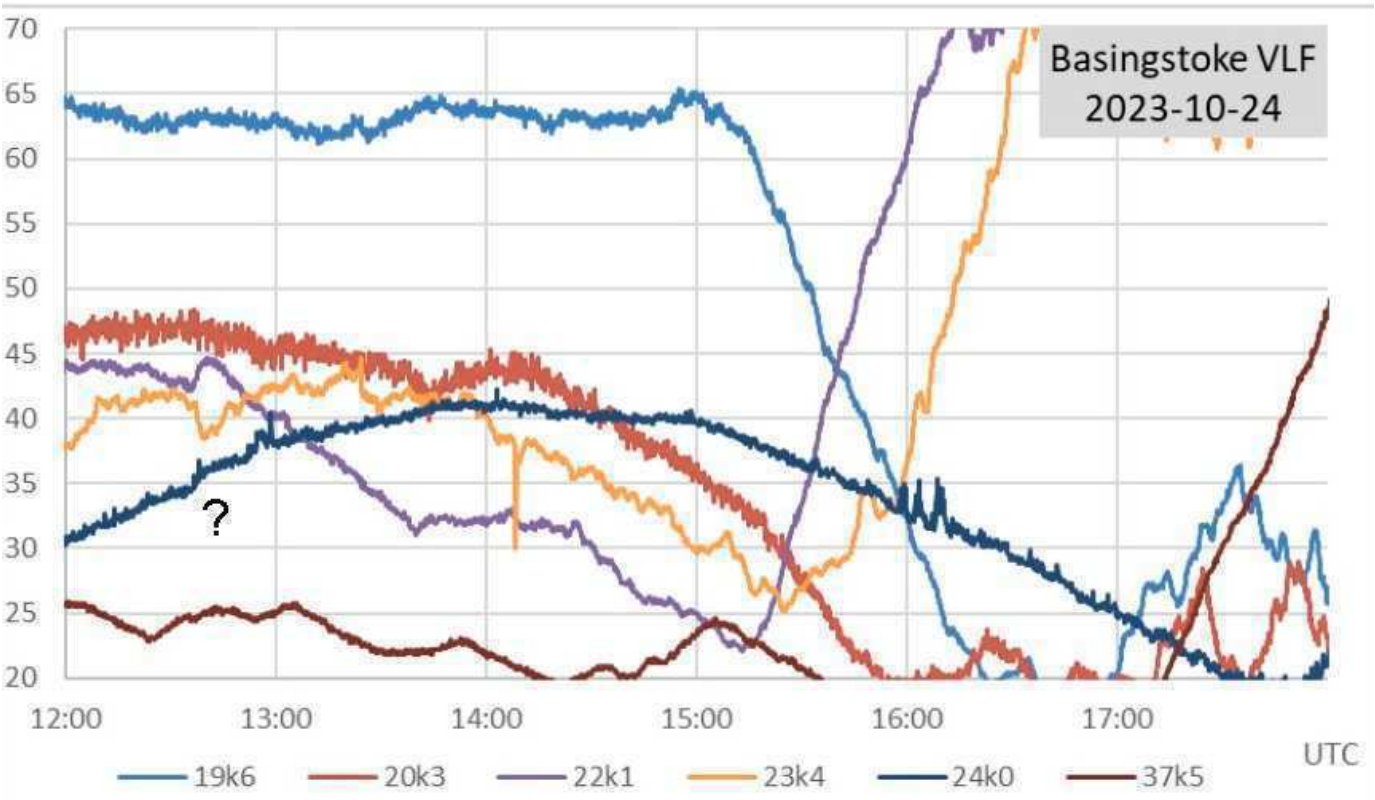
The British Astronomical Association
A company limited by guarantee
Registered Charity No. 210769
Founded in 1890
PO Box 702, Tonbridge, TN9-9TX 020-7734 4145
www.britastro.org

Please send all reports and observations to jacook@jacook.plus.com
BAA Radio Astronomy Section. Director Paul Hearn.

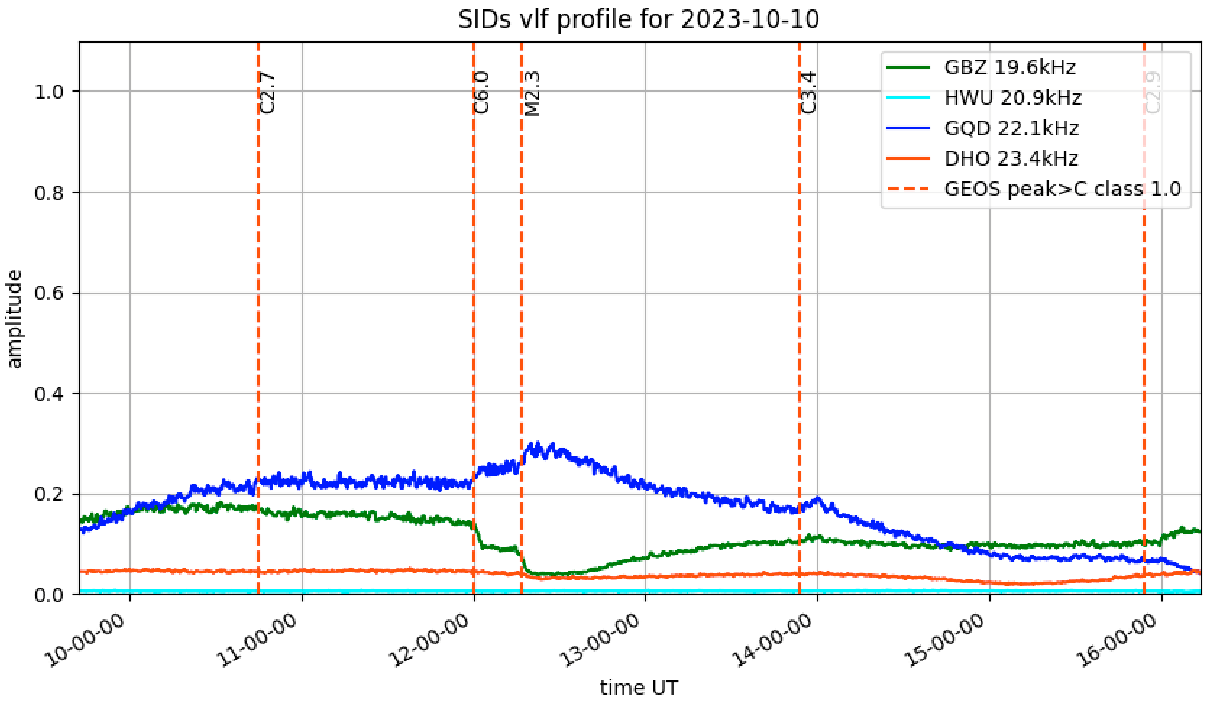
RADIO SKY NEWS 2023 OCTOBER.

VLF SID OBSERVATIONS.

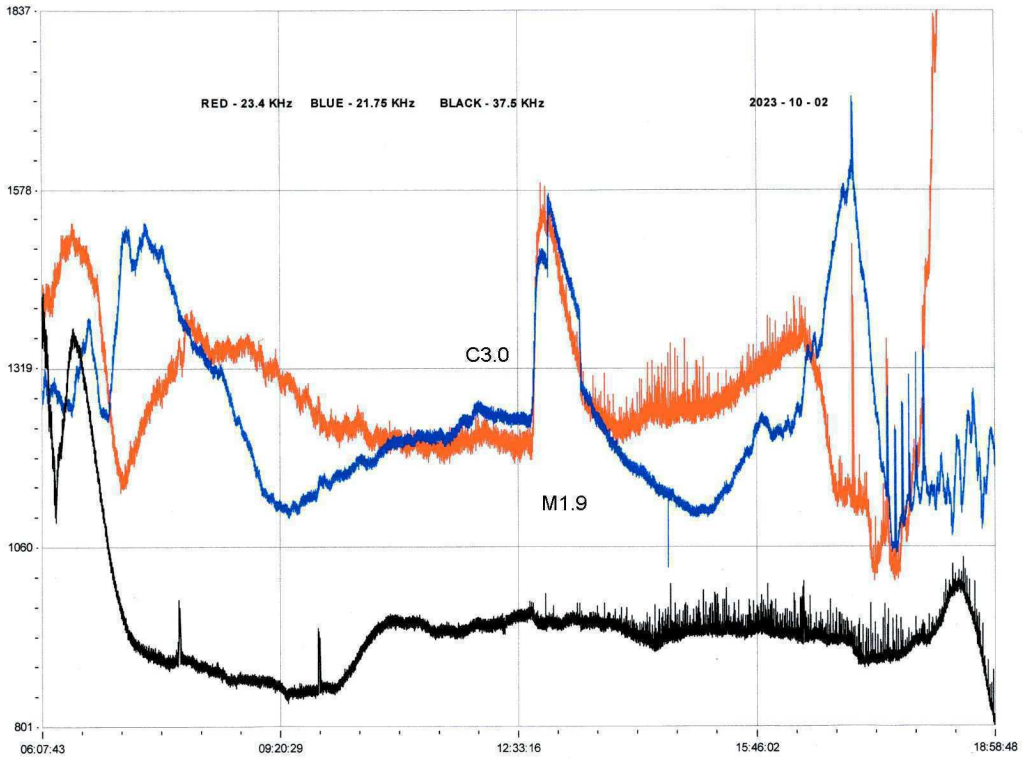
Solar flare activity in October was much lower than last month, only about ¼ of the level recorded at the peak in May. This may be an indication of a double peaked solar cycle, similar perhaps to the previous cycle. Predictions still show a peak expected in 2024 or 2025. It is also worth noting that there were some stronger flares during our night time, slightly biasing our statistics. This should even out over the longer term.



This recording from October 24th by Paul Hyde shows a rather puzzling SID-like response at 12:40 on 22.1kHz and 23.4kHz. They are good mirror images, and so probably not transmitter effects. There is also a very small rise in the 24kHz signal. The nearest flare listed in the SPWC satellite data is magnitude B8.6 at 12:26, ending before the SID starts. The rest of the day remained quiet with some small C-class flares, none of which were recorded. The recording also shows the changing sunset times over the various paths; 19.6kHz and 22.1kHz being the earliest, followed 30 minutes later by 23.4kHz, and over two hours later on the trans-Atlantic signals at 24kHz and 37.5kHz.

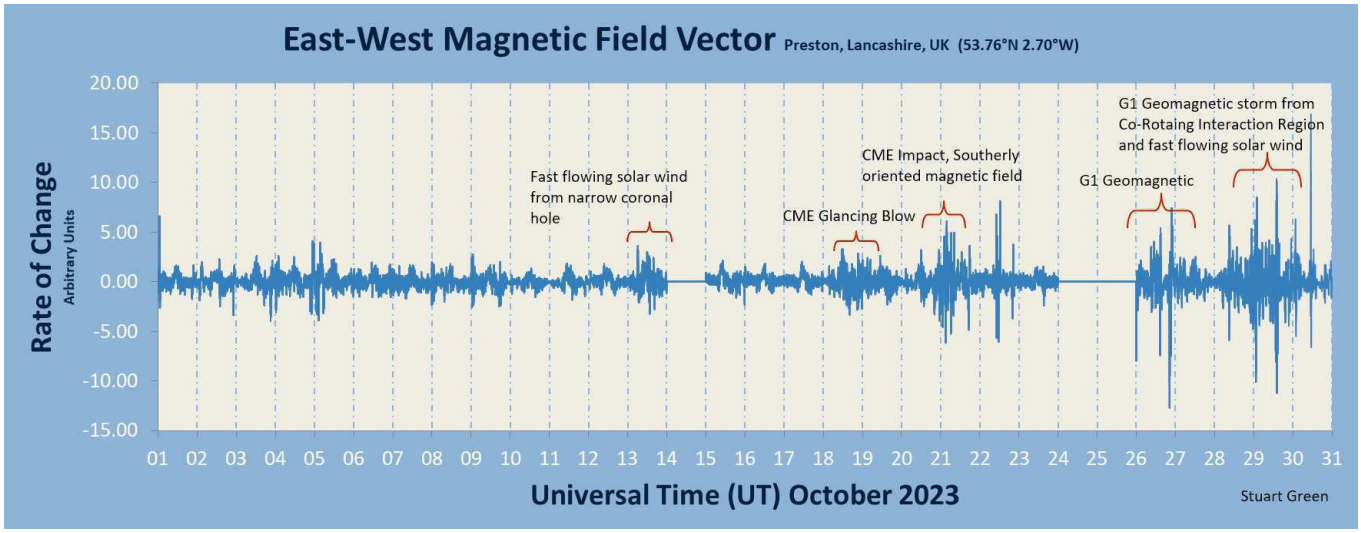


The recording by Mark Prescott from the 10th shows the stronger of the two M-class flares recorded. The M2.3 flare has interrupted the earlier C6.0 flare, giving good mirror image SIDs at 19.6kHz and 22.1kHz. 23.4kHz has remained largely unaffected, with just a very minor drop in signal level. Different active regions produced these flares, although they were less than 10 degrees apart. The later C3.4 flare is also well shown at 22.1kHz.

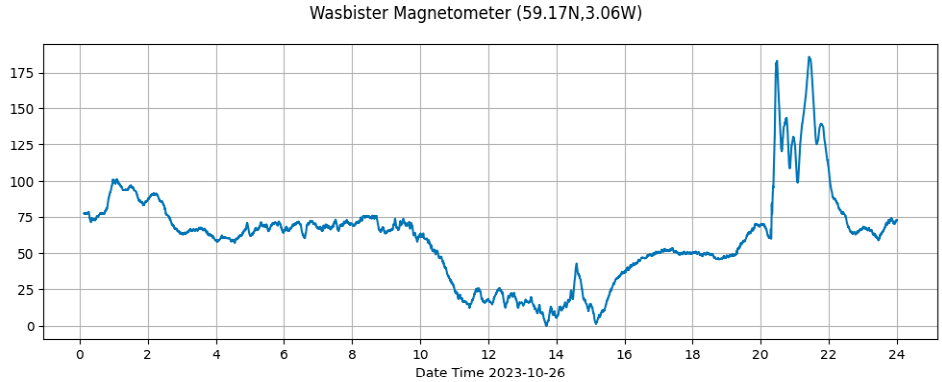


Colin Clements' recording from the 2nd shows the M1.9 flare at 23.4kHz (red) and 21.75kHz (blue) with very strong SIDs, along with the much weaker C3.0 flare. The 21.75kHz response appears to be a spike and wave type SID, although the dip is fairly weak and the following rise very sharp. Grindavik at 37.5kHz remained unaffected.

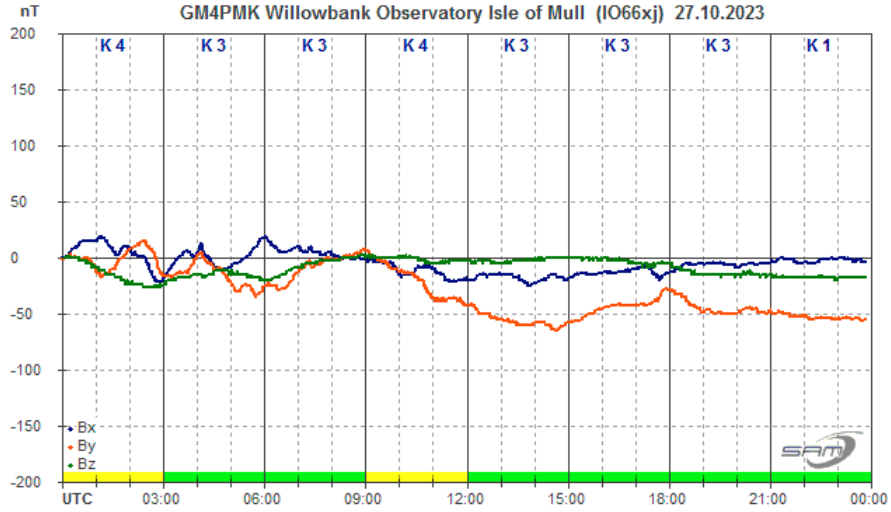
MAGNETIC OBSERVATIONS.



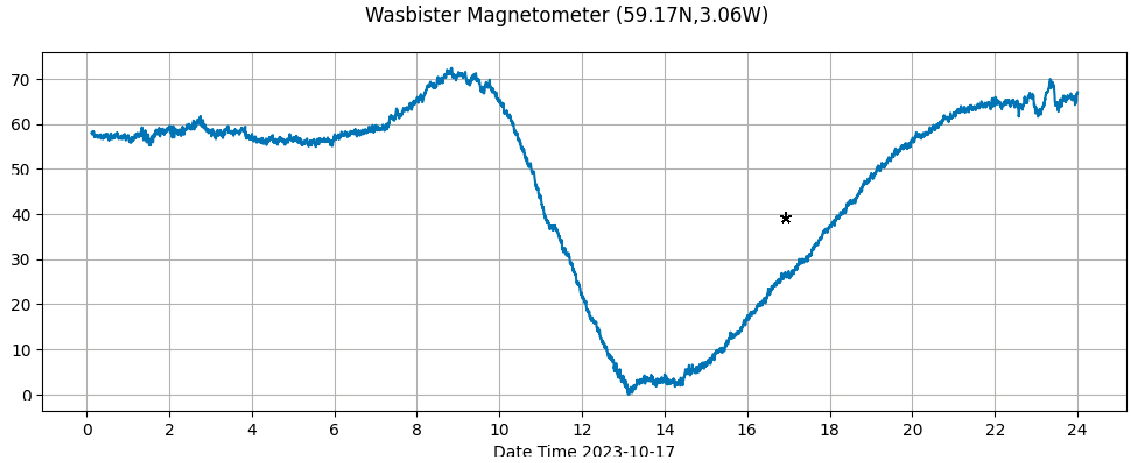
Stuart Green's monthly summary of magnetic activity shows a very quiet period to start the month, followed by increasing activity. The two gaps were due to local interference that has been removed from the data. There were CMEs associated with some of the stronger flares, but they were mostly not Earth directed, and so caused minimal disturbances. There were also some coronal holes present, resulting in some periods of high speed solar wind.



The sudden impact at about 20:30 on the 26th is shown here by Callum Potter. It was recorded by all of our observers, and appears to be a CME impact, although the source is not known. Its disturbance was very short, fading out the next morning as shown by Roger Blackwell.



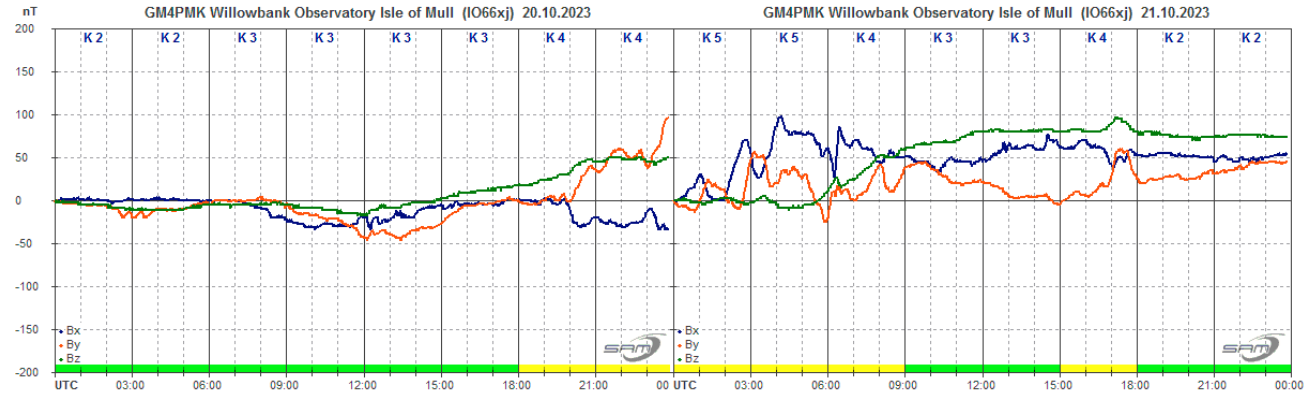
The space weather web site reported an incidence of PC3 magnetic waves on the 17th. These were identified by the Lofoten observatory in Norway, showing a period from about 16:40 to 17:10 with a stable sine wave magnetic disturbance. Callum Potter has our most northerly sensor in Orkney, but did not record anything that stands out:



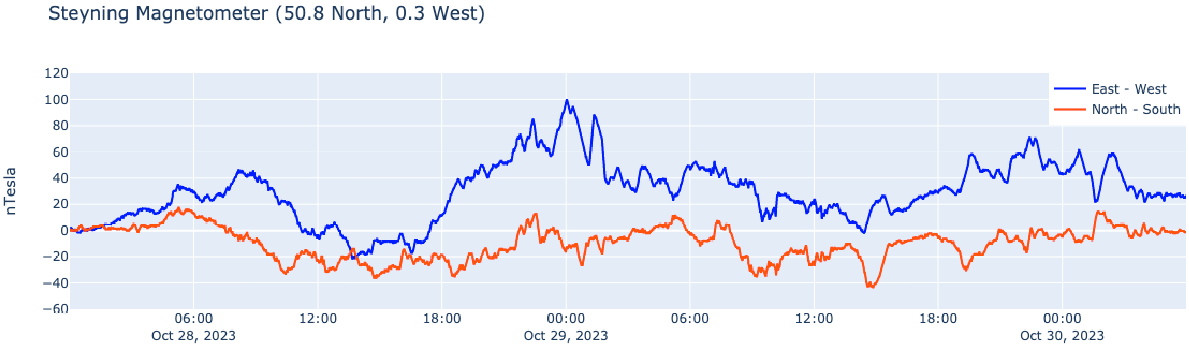
I have marked the position '*' on his recording. This link is to the space weather item, showing the disturbance in greater detail:

https://spaceweathergallery2.com/indiv_upload.php?upload_id=200865

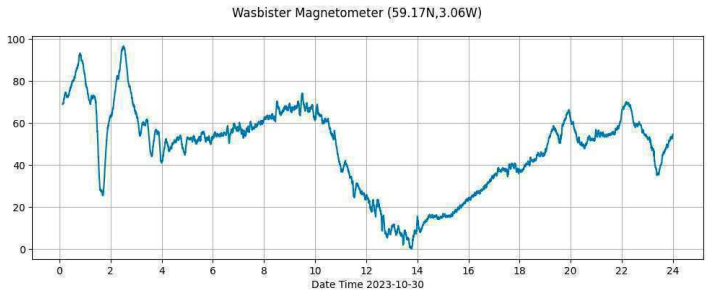
These effects are usually seen during periods of very quiet solar activity.

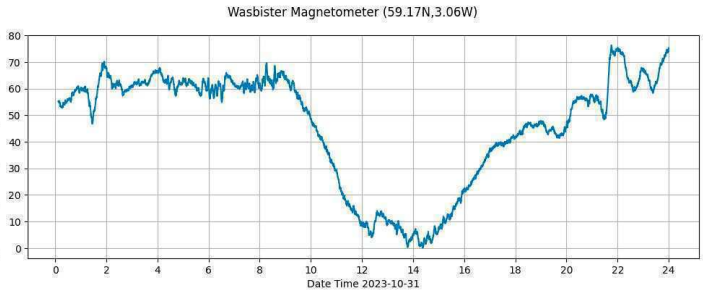


A combination of higher speed solar wind and minor CME impacts produced some moderate disturbance overnight from the 20th to 21st, shown here by Roger Blackwell.



Nick Quinn's recording from the 28th / 29th shows a similar disturbance, mostly due to a faster solar wind.

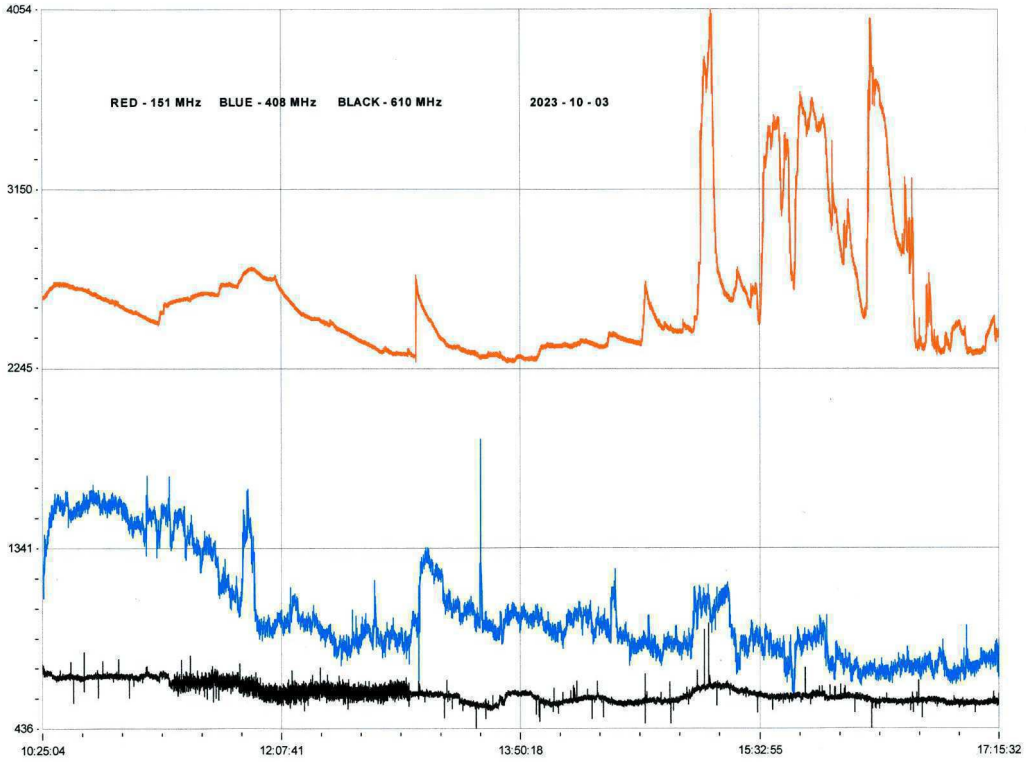




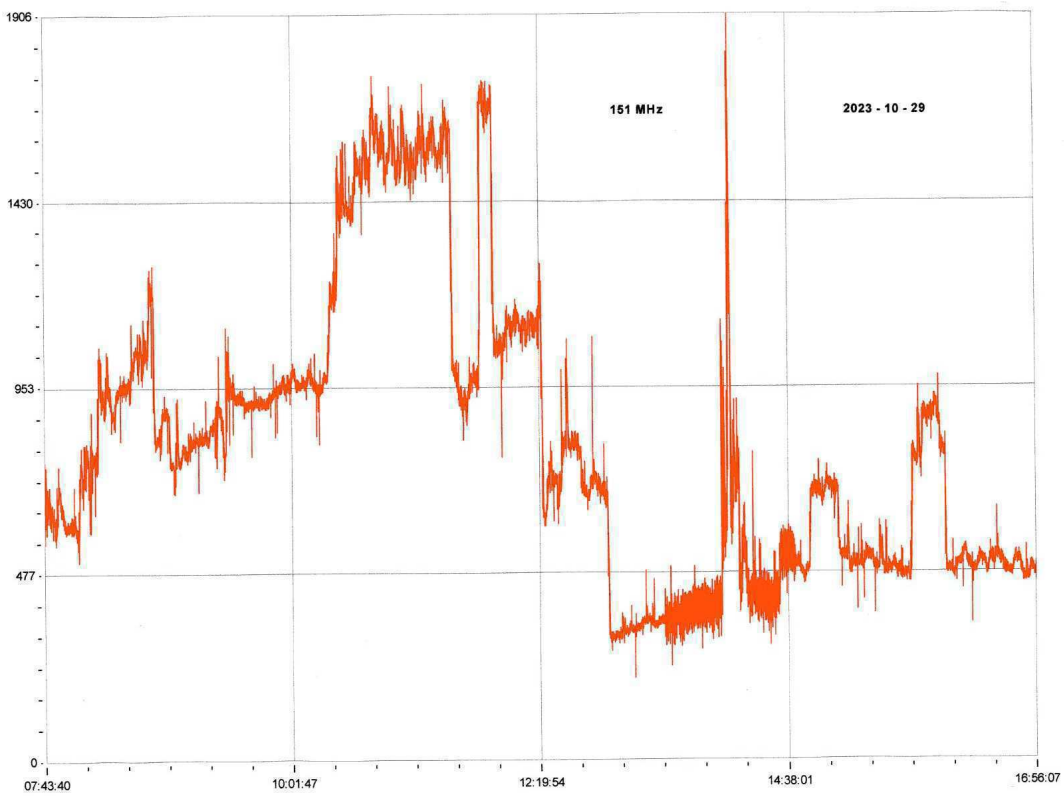
The disturbance continued to the end of the month, shown in Callum Potter's recording. While comparing these recordings, note the different location details covering the north and south of the country.

Magnetic observations received from Roger Blackwell, Colin Clements, Stuart Green, Callum Potter, Nick Quinn and John Cook.

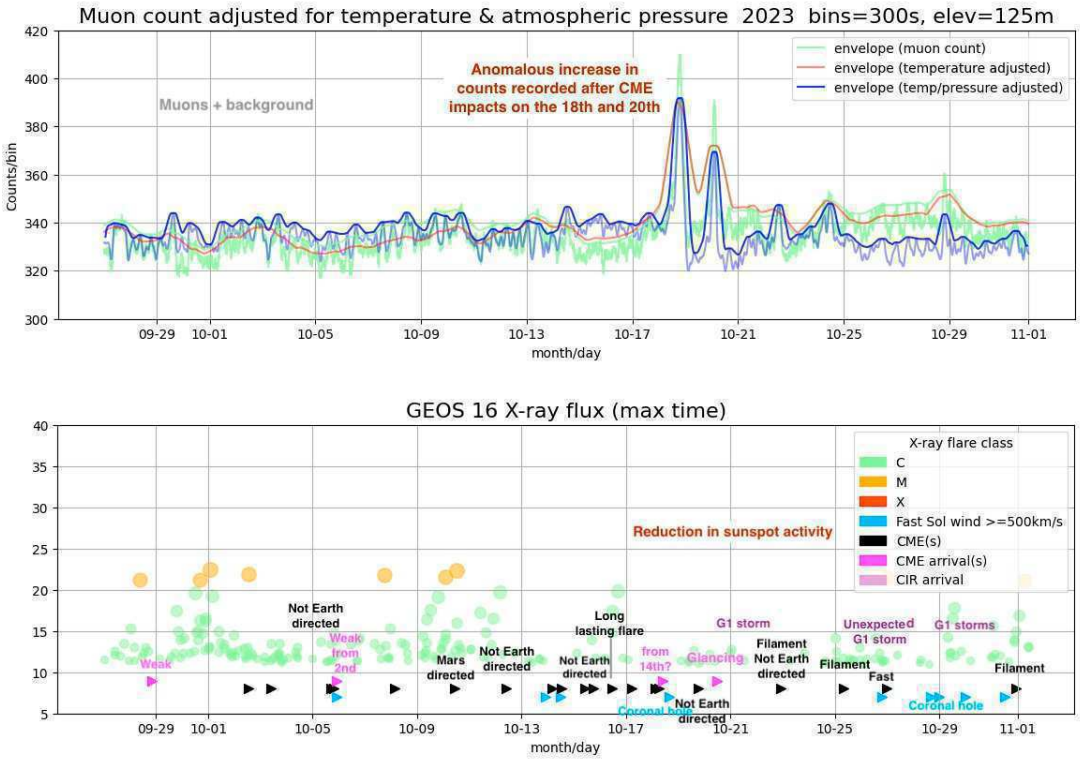
SOLAR EMISSIONS.



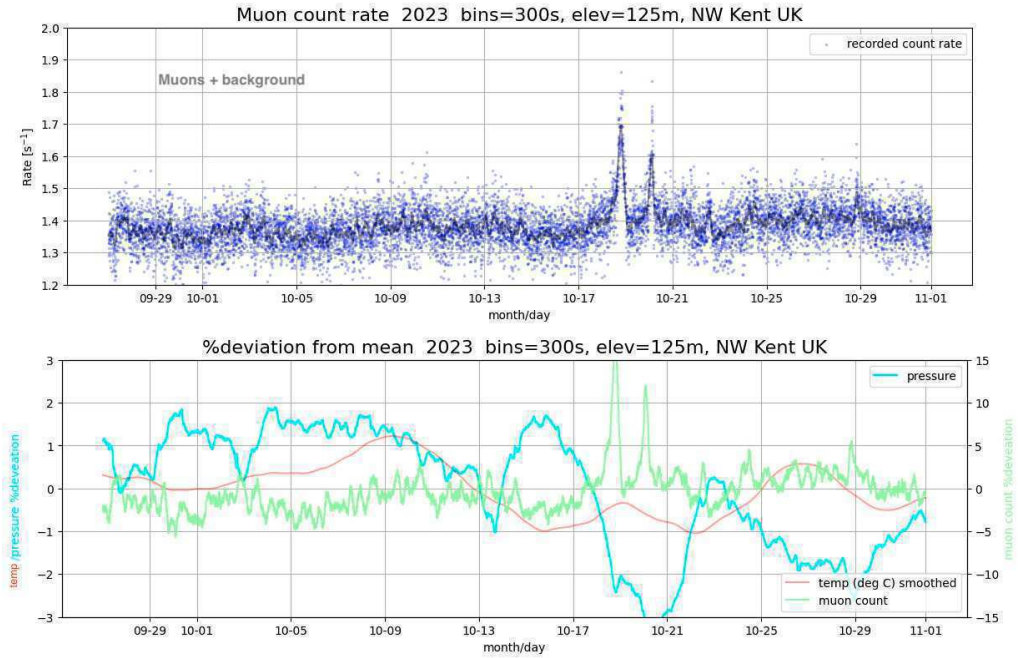
With the sun much lower in the sky, Colin Clements' VHF / UHF aerials are now being shadowed by the local houses. The 151MHz system did manage to detect some emissions in the afternoon of the 3rd, probably related to the C- class flares that we recorded. The 408MHz and 610MHz systems showed much less activity due to the shadowing. Colin has been experimenting with alternative aerial designs for use in the house loft during the winter months. These are Bi-Quad designs, using wire mesh reflectors, and vertically polarised to fit inside the loft. The outdoor aerials are horizontally polarised. The 151MHz aerial was under test on the 29th, and showed some emissions from the flares on the 29th:



MUONS.



Mark Prescott's muon recording shows two strange peaks in activity on the 18th and 20th, matching the flares and solar wind recorded in the SID and magnetic data. The magnitude of the muon peaks is much greater than expected. Following these peaks, the temperature / pressure adjusted counts are lower than previously.

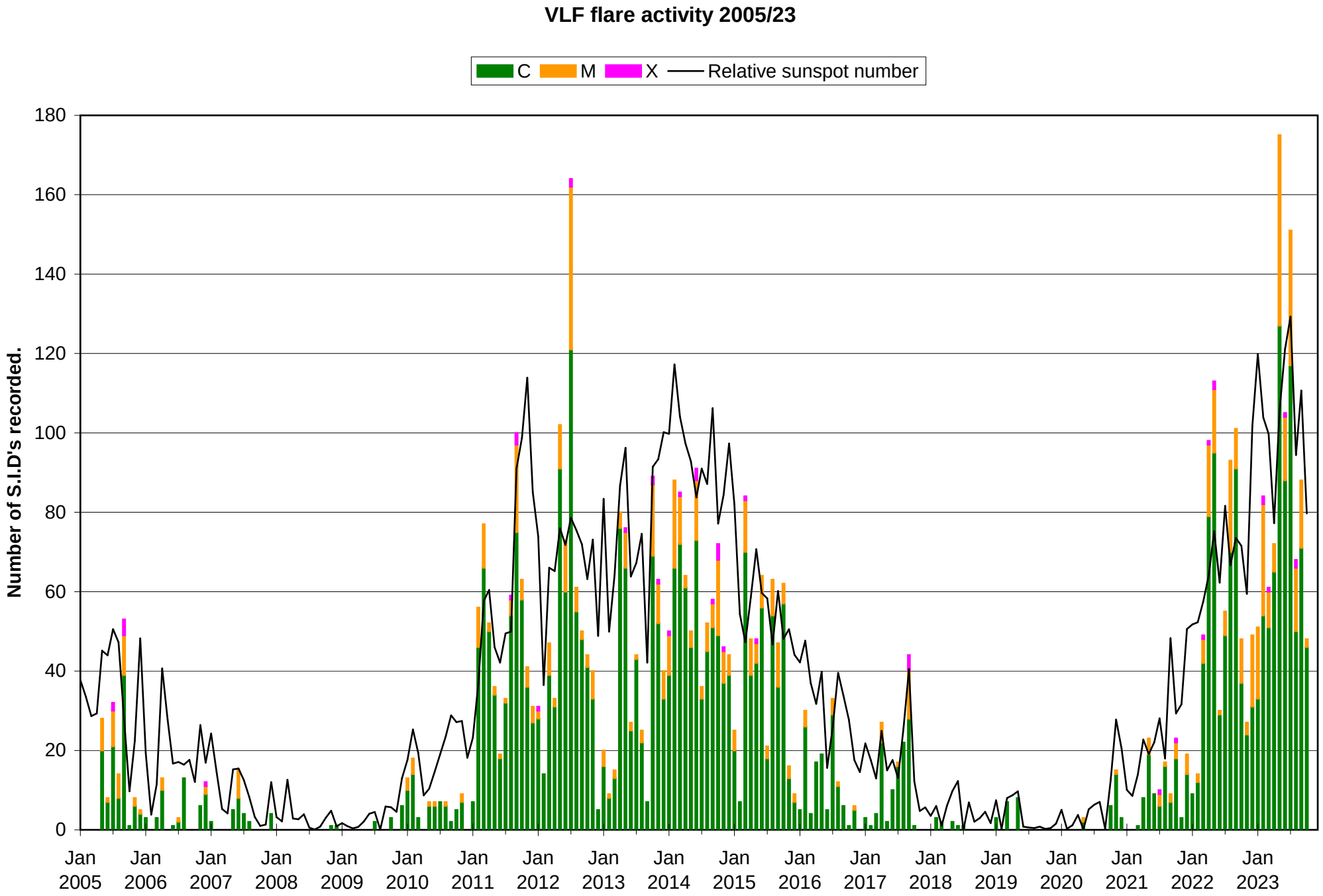


The pressure chart (light blue) also shows a strong drop during these events, so may well have affected the way that the incoming radiation reacts as it reaches our ground level sensors.

METEORS.

There were no observations of the October Orionids received. November and December are busy months for meteor activity, and so any reports will be welcome.

At the BAA AGM, John Mason, director of the meteor section, talked of a possible display of Bielid meteors in early December. This is a rarely seen shower, but there have been predictions of a good display this year. Predictions are no guarantee of course, but it would be worth a look. I believe that the predicted date was around the 3rd /4th.


VLF flare activity 2005/23
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
180
Jan 2005
Jan 2006
Jan 2007
Jan 2008
Jan 2009
Jan 2010
Jan 2011
Jan 2012
Jan 2013
Jan 2014
Jan 2015
Jan 2016
Jan 2017
Jan 2018
Jan 2019
Jan 2020
Jan 2021
Jan 2022
Jan 2023

BAA Radio Astronomy Section.

BARTELS DIAGRAM

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

2556

			2239						2021 January																
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
F																										

2557

			2240										2021 February												
20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F																										

2558

			2241											2021 March												
16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14
F																					C					

2559

			2242															2021 April								
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	10
F	B									B																

2560

			2243																		2021 May					
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
F						B			C		CCCC															M

2561

			2244																					2021 June		
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
F	CC	CC		C									C	CCMM	CCBM			CCCC		C						

2562

				2245																						
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
F				CCC	CCB																C			CBC		CC

2563

2021 July				2246																						
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
F		MCXM	MC					CCB							C		C									

2564

				2021 August																						
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
F																							CCC		C	

2565

				2248				2021 September																		
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
F	C		CCCC	MCCC	CC	C									CC	C										

2566

					2249							2021 October														
20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
F	C		MM			C		C		C									M							

2567

					2250											2021 November										
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
F									CCCM	CCCC	CMMX	CC	CCC					CC								

2568

					2251															2021 December						
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
F	C																					M				

2569

					2252																		2022 January			
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
F					CCC	CC	C			CM	M	MCC		CC	CCCM											

2570

							2253																			
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	31	1
F							C	C											C	CC		C	BCCC			C

2571

2022 February						2254																				
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	28
F	CC	CC					C			MCCC		CCM														C

2572

2022 March							2255																			
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
F	CM				C	C				CCCC	C		M	CCMC					CC		CC	CCCC	C		C	C

2573

					2022 April			2256																		
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
F	CMC	MCCC	CCCC	CCCX	CCCC	CCMM	CC	C		C		CC	C		CBCC			MMCC	CCCM	CCCM	MMCM	CCCC	CMCC	CC	CMC	C

2574

							2022 May																			
24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
F		MCCC	CCCC	CCC	CC	MCCM	MMXM	CCCC		MCX	BMCM	CMMC	CC	CC	CCC	C	CCX	CCMM	CCCM	CCCC	CCCC	C	CMC	CCCC	CCCC	CCMM	CMM

2575

							2258				2022 June															
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
F	CCC	CC	CC	CC	CCM	CC	CC	CC											CC	CCMC	C		C	CCCC		C

2576

							2259								2022 July											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13
F	CCCC	CCC	C	CC	C	CC	CC	C	C							BC	C	CC			M	CCCC	CCCC	CM	CCCC	CCC

2577

								2260																		
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
F	CMCM	CCC	MCM	CCCC		C	CCCC		CCCC	C		C	C						CC	C		CC				

2578

									2261																	
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
F		C	CC	CCCC	C	CMMM	MCC	CCMM	CMMM	MCCC		C	C		CCCM	CMMM	CMMM	CCMM	CMMM	CCCM	C	CC	CCCC	CCCC	CCCC	CCMC

2579

									2262																	2022 October
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
F	CC			C	CCCC	CCCC	CCCC	MCCC		MM	M	CC	C	MCCC	M	CCCC	CCCM	CCCC		CCC	CCCC		CC	CCMM	CC	CMMC

2580

2022 October								2263																		
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
F	CMMM	M	C	CM	C	CCCC	CM	MMCC	CC	C	M	C	C		C		CC		CB		CC	C	C			

2581

		2022 November						2264																		
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	24	25
F							C	C			C	MCCM	CC	C	C	CCC	CC	CC	CCC	M			CCC			

2582

					2022 December				2265																	
26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F			C			C	M				C				C			MMMM	CMCM	MMMC		CC	CCC	M	C	C

2583

										2023 January																
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	17	18
F	CC	C		CCC	CM		CM	CCCM	C						CC	MCCM	MM	MCMM	MC	MCMC	MC	CCC	CM	C		MC

2584

											2267						2023 February									
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	13	14
F	MMC	CC	CC	CMCM	C	CCC	MCM	CMCC		C	C	CC		C		C	C	C	CC	CM	MMMM	MCCM	MMXM	MMMM	CCCM	CCM

2585

											2268				2023 March											
15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13
F	CCCC	C	CX	C	CC	CMCC	MCCM	CCCM	CMCC	CCM	CC	CC		CC	CCCC	MCCX	CMMC	CCMC	MCCC	C	MC	CCC	CCCC	C		

2586

											2269										2023 April					
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
F	C		C	CCCM	C	CCC	C	C		C		CC	CCC	CC	MC	M	CC					CCC	MC		CC	CCCC

2587

											2270											2023 May				
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
F	MCCC	MC	CCC	CCCC	CCMC	CCCC	C	CC	CCC	CCC	CCCC	M	CC		CC		C	M	CC	CCCC	CCM	CCMC	CCCC	MMMM	MCCC	CMM	CC

2588

												2271													2023 June	
7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2
F	C	CCCM	MCMM	MCCC	MCCM	CCCC	CCCC	C	C	CCCM	CCCC	MMMM	MCCM	MMMM	CCCM	CCMC	CCMC	MCCM	CCMC	CCC	CCC	MC	C	MMMC	CMCM	CCCC	CC

2589

													2272													
3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
F	CC	CCCC	C	CCCC	CMCC	CC	CM	C		CCCC	CCCC	CC	CC	MCMM	CC	M	MC	CCMX	CMMC	CMCC	C	CCMC	CCCC	CCMC	CMCC	MCC	CCCM

2590

	2023 July										2273															
30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
F	CCCC	CCCC	CCCC	MCCC	MC	CCCM	CCM	MC	C	CCC	CCCC	MMMM	MMCC	CCCM	MCCC	MMMC	MCMM	CCC	MMMM	CMCM	C	C	CC	CC	C	CCCM	CMCM

2591

					2023 August							2274														
27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
F	CMCC	CMCC	CCCM	MC	CMCC	MMMM	MMMM	CMCC	CC	MMCX	CM	CMMX	MC	C		CCCC	CCCC	C		C	CC	CCC		C	CC	CC

2592

										2023 September		2275														
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	17	18
F	CCC	C	C	C			C			MC	MCC	CC	MCC	CCCC	CCM	CCC	C	C	CCCM	MCCC	C	CCM	C	CC	C	C

2593

														2023 October												
19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F	MCCC	CMCC	M	CCMM	CCCC	CCMC	C	CC		MCC	CCC	CCCC	CCM	CCCC	C	C	CC	CC	CCC	CMCC	CC			C	C	C

2594

													2277				2023 November									
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
F	CCC		C	C					CC	CC			CCCC													

BAA Radio Astronomy Section. **2023 OCTOBER.**

	Xray class	Observers	John Cook (23.4kHz/*22.1kHz*) Tuned radio frequency receiver, 0.58m frame aerial.				Roberto Battaiola 20.3kHz Modified AAVSO receiver.				Paul Hyde (22.1kHz/*24kHz*) Spectrum Lab / PC 1.5m frame aerial.				Mark Edwards (24.0/*22.1*/**37.5kHz**) Spectrum Lab / PC 2m loop aerial.				Colin Clements (21.75/*23.4*/**37.5kHz**) Tuned Radio Frequency receivers, 0.76m screened loop aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C5.0	6	09:45	09:52	10:26	2					09:42	09:52	10:24	2	09:45	09:52	10:23	2	09:46	09:55	10:19	2
1	?	1													***10:03***	***10:12***	***10:53***	***2+***				
1	C3.6	6	11:13	11:15	11:44	1+					11:10	11:14	11:24	1-	11:13	11:18	11:34	1	*11:14*	*11:15*	*12:21*	*2+*
1	C2.9	3	14:21	14:24	14:38	1-					14:18	14:27	?	-	14:23	14:30	?	-				
1	C3.4	2									14:41	14:48	15:14	2	14:45	14:56	15:15	1+				
2	C2.9	2									09:00	09:04	09:19	1	*09:02*	*09:08*	*09:19*	*1-*				
2	C3.0	2	11:53	11:57	?	-									*11:53*	*12:02*	*12:30*	*2*				
2	**M1.9**	9	12:42	12:47	14:12	3	12:39	12:48	13:13	2	12:37	12:47	15:04	3+	*12:41*	*12:50*	*14:02*	*2+*	12:41	12:52	14:54	3+
3	C3.5	4	09:37	09:42	10:07	1+					09:36	09:45	10:22	2+	**09:37**	**09:42**	**10:18**	**2**				
3	C1.9	1													12:10	12:13	12:23	1-				
3	C2.3	2									15:39	15:49	?	-	15:43	15:47	15:57	1-				
3	C2.0	2									16:11	16:17	16:29	1-	16:12	16:16	16:26	1-				
3	C2.0	2									16:37	16:42	16:55	1-	16:39	16:41	16:46	1-				
3	C3.5	2									17:02	17:05	17:23	1	17:02	17:05	17:18	1-				
4	C3.0	3					09:47	09:53	09:59	1-	09:48	09:54	10:13	1	09:52	09:54	10:01	1-				
5	C3.5	2									16:27	16:32	16:54	1+	16:27	16:33	16:59	1+				
6	C3.4	3	10:59	11:06	11:31	1+					10:56	11:06	11:29	2					10:35	11:13	11:35	2+
6	C4.0	1													17:51	17:55	18:00	1-				
7	C3.5	2									08:07	08:15	08:27	1	***08:07***	***08:18***	***08:39***	***1+***				
7	C2.8	4									13:47	13:54	14:42	2+	13:50	14:00	14:24	2	13:50	13:58	14:21	1+
7	?	1													14:44	14:48	14:56	1-				
8	C3.4	7	12:39	12:44	?	-	12:38	12:42	12:45	1-	12:39	12:42	13:15	2	12:39	12:42	13:05	1+	12:39	12:46	13:56	2+
8	C2.4	2									14:08	14:12	14:25	1-	14:01	14:11	14:20	1				
8	?	1													18:04	18:08	18:20	1-				
9	C6.4	2													*08:35*	*08:41*	*08:50*	*1-*				
9	C7.6	10					11:33	11:42	12:05	1+	11:33	11:44	13:03	3	11:35	11:43	13:11	3	11:36	11:48	12:41	2+
9	?	1													13:05	13:06	13:11	1-				
9	C2.0	1													14:36	14:45	14:53	1-				
10	C2.7	3	10:39	10:42	11:05	1+					10:35	10:46	11:03	1+	10:36	10:42	10:56	1				
10	C6.0	6	11:55	12:01	?	-	11:52	12:01	12:08	1-					11:55	12:01	?	-	11:56	12:06	12:12	1-
10	**M2.3**	11	12:12	12:19	13:37	2+	12:10	12:19	12:32	1	12:10	12:19	?	-	12:09	12:22	13:15	2+	12:12	12:21	13:50	3
10	?	1													13:21	13:25	13:32	1-				
10	C3.4	3	13:45	13:48	13:55	1-					13:49	13:55	14:37	2+	13:51	13:55	14:11	1				
10	C2.9	1													15:49	15:55	16:07	1-				
10	C2.4	1													16:50	16:54	17:04	1-				
11	C7.2	11	*09:33*	*09:39*	*09:56*	*1*	09:31	09:39	09:46	1-	09:33	09:43	10:10	2	*09:33*	*09:41*	*10:16*	*2*	09:37	09:43	10:17	2
11	C4.9	4	14:35	14:44	15:07	1+	14:22	14:43	15:01	2	14:26	14:43	15:00	2	*14:27*	*14:32*	*14:40*	*1-*				
12	?	2									13:13	13:16	13:31	1-	13:12	13:19	13:26	1-				
14	C3.5	1													16:15	16:24	16:46	1+				
15	C3.9	1													16:28	16:35	16:45	1-				
16	C7.5	6	10:41	10:53	12:15	3					10:39	10:53	11:48	2+	10:44	10:53	?	-	10:45	10:58	13:03	3+
16	C4.9	1													11:07	11:21	11:40	2				
16	?	2													*12:31*	*12:35*	*12:44*	*1-*				
16	C9.8	4									16:02	16:10	16:26	1	*16:05*	*16:08*	*16:25*	*1*				
19	C2.7	6									13:55	14:03	14:27	1+	13:56	14:01	14:26	1+	13:56	14:06	15:38	3
20	C1.7	2									11:04	11:12	11:34	1+	11:07	11:12	11:21	1-				
24		1									12:37	12:40	12:55	1-								
25	C1.5	2									12:44	12:49	12:57	1-	12:46	12:50	12:58	1-				
25	C1.7	1													13:05	13:11	13:15	1-				
25	?	2									13:23	13:29	13:38	1-	13:25	13:29	13:34	1-				
26	C1.7	1									12:20	12:25	12:50	1+								
26	C4.2	6					13:24	13:28	13:33	1-	13:24	13:28	13:49	1	13:25	13:28	13:50	1				
29	C2.4	2									08:58	09:04	09:13	1-	*08:59*	*09:03*	*09:08*	*1-*				
29	C2.5	3									09:50	09:52	09:59	1-	*09:50*	*09:52*	*09:58*	*1-*				
29	C6.6	11	11:37	11:43	12:19	2	11:34	11:43	12:06	1+	11:39	11:44	12:20	2	11:38	11:43	12:07	1+	11:38	11:44	12:05	1+
29	?	2													**12:29**	**12:38**	**12:55**	**1+**	**12:16**	**12:37**	**13:22**	**2+**
29	C7.8	10	13:07	13:09	13:15	1-	13:03	13:10	13:31	1+	13:07	13:11	13:45	2	13:07	13:11	13:40	2	13:08	13:12	13:15	1-
29	C2.0	2									13:54	13:58	14:09	1-	13:56	13:58	14:11	1-				

BAA Radio Astronomy Section. **2023 OCTOBER.**

	Xray class		Steve Parkinson (Various) Tuned radio frequency receiver, frame aerials.				Andrew Thomas (19.6kHz) Tuned radio frequency receiver, 0.6m frame aerial.				Phil Rourke (23.4kHz) Spectrum Lab, 0.6m frame aerial.				Mark Prescott (19.6kHz/*22.1kHz*) SpectrumLab/Starbase, Active mini-whip aerial.				John Elliott (18.3kHz) Tuned radio frequency receiver, 0.5m frame aerial.			
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)	
1	C5.0		09:46	09:52	10:12	1+	09:46	09:55	10:18	1+												
1	?																					
1	C3.6		11:13	11:16	11:35	1	11:13	11:17	11:30	1-												
1	C2.9																					
1	C3.4																					
2	C2.9																					
2	C3.0																					
2	**M1.9**		12:41	12:50	13:35	2+	12:40	12:52	13:56	2+	12:42	12:50	13:57	2+	12:44	12:53	14:03	2+				
3	C3.5		09:38	09:43	10:22	2																
3	C1.9																					
3	C2.3																					
3	C2.0																					
3	C2.0																					
3	C3.5																					
4	C3.0																					
5	C3.5																					
6	C3.4																					
6	C4.0																					
7	C3.5																					
7	C2.8		13:50	13:55	14:20	1+																
7	?																					
8	C3.4		12:39	12:43	12:55	1-																
8	C2.4																					
8	?																					
9	C6.4										08:36	08:39	08:50	1-								
9	C7.6		11:34	11:45	12:40	2+	11:34	11:45	12:52	2+	11:34	11:46	12:24	2+	11:39	11:50	12:53	2+	11:35	11:45	12:30	2+
9	?																					
9	C2.0																					
10	C2.7																					
10	C6.0										11:57	12:05	?	-	11:59	12:03	?	-				
10	**M2.3**		11:55	12:20	13:20	2+	11:54	12:21	13:51	3	?	12:20	13:18	-	12:14	12:22	13:51	3	12:10	12:20	13:50	3
10	?																					
10	C3.4																					
10	C2.9																					
10	C2.4																					
11	C7.2		09:34	09:41	10:07	2	09:33	09:41	10:16	2	09:30	09:33	09:39	1-	09:39	09:45	10:10	1+	09:35	09:40	10:50	2+
11	C4.9																					
12	?																					
14	C3.5																					
15	C3.9																					
16	C7.5		10:41	10:55	11:53	2+													10:45	11:00	11:45	2+
16	C4.9																					
16	?		12:31	12:34	12:40	1-																
16	C9.8																		16:08	16:10	16:50	2
19	C2.7		13:55	14:01	14:12	1-									*13:57*	*14:05*	*14:27*	*1+*				
20	C1.7																					
24																						
25	C1.5																					
25	C1.7																					
25	?																					
26	C1.7																					
26	C4.2		13:24	13:28	13:38	1-									*13:26*	*13:32*	*?*	-				
29	C2.4																					
29	C2.5																					
29	C6.6		11:37	11:44	12:20	2	11:36	11:43	12:16	2	11:37	11:46	13:00	2+	11:43	11:46	12:19	2	11:35	11:45	12:00	1
29	?																					
29	C7.8		13:08	13:11	13:30	1	13:07	13:11	13:24	1-	13:06	13:12	14:01	2+	*13:11*	*13:14*	*13:37*	*1+*				
29	C2.0																					

BAA Radio Astronomy Section. **2023 OCTOBER.**

	Xray class		Richard Coffee (19.6kHz/*24kHz*) Spectrum Lab 0.55m frame aerial.				Chris Bailey Spectrum Lab.				Colin Briden Spectrum Lab 1.2m frame Aerial.										
DAY			START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)		START	PEAK	END (UT)
1	C5.0																				
1	?																				
1	C3.6																				
1	C2.9																				
1	C3.4																				
2	C2.9																				
2	C3.0																				
2	**M1.9**																				
3	C3.5																				
3	C1.9																				
3	C2.3																				
3	C2.0																				
3	C2.0																				
3	C3.5																				
4	C3.0																				
5	C3.5																				
6	C3.4																				
6	C4.0																				
7	C3.5																				
7	C2.8																				
7	?																				
8	C3.4		12:39	12:46	12:50	1-															
8	C2.4																				
8	?																				
9	C6.4																				
9	C7.6		11:30	11:46	12:02	1+															
9	?																				
9	C2.0																				
10	C2.7																				
10	C6.0																				
10	**M2.3**		11:53	12:14	12:45	2+															
10	?																				
10	C3.4																				
10	C2.9																				
10	C2.4																				
11	C7.2		09:37	09:41	09:54	1-															
11	C4.9																				
12	?																				
14	C3.5																				
15	C3.9																				
16	C7.5																				
16	C4.9																				
16	?																				
16	C9.8		16:01	16:05	?	-															
19	C2.7		*13:55*	*13:58*	*14:17*	*1*															
20	C1.7																				
24																					
25	C1.5																				
25	C1.7																				
25	?																				
26	C1.7																				
26	C4.2		13:23	13:26	13:33	1-															
29	C2.4																				
29	C2.5		*09:55*	*09:57*	*10:14*	*1*															
29	C6.6		11:38	11:41	11:55	1-															
29	?																				
29	C7.8		13:04	13:16	13:20	1-															
29	C2.0																				