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BAA Radio Astronomy Section.

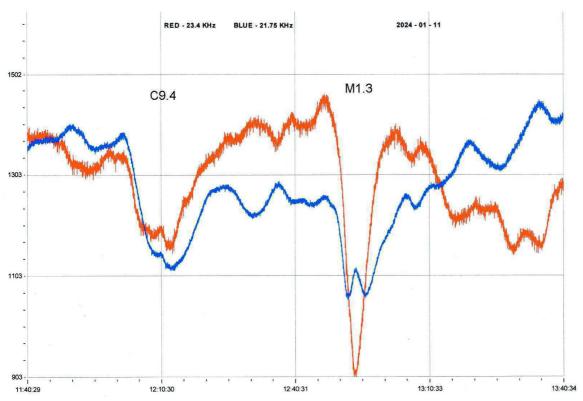
Please send all reports and observations to jacook@jacook.plus.com Director Paul Hearn.

RADIO SKY NEWS

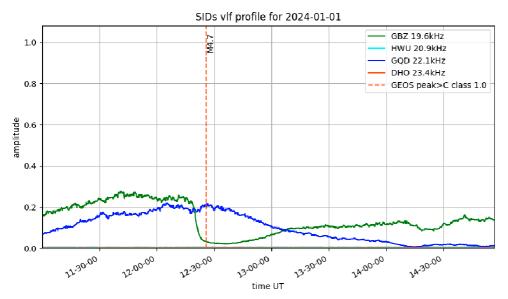
2024 JANUARY.

VLF SID OBSERVATIONS.

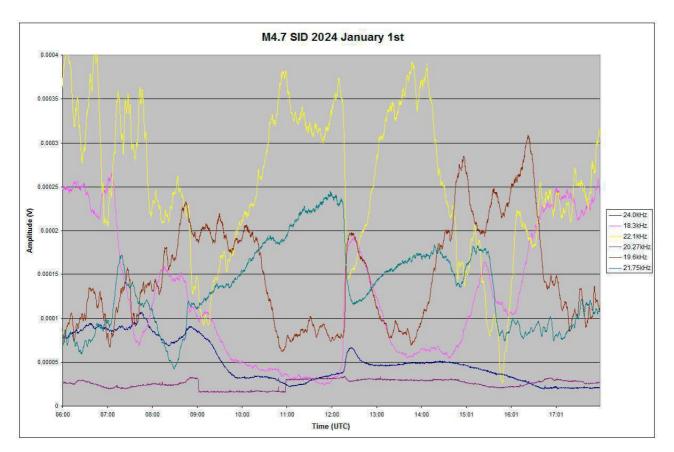
Solar flare activity has been at similar levels to the last few months, although the flare magnitudes have been much higher. Many of the weaker flares have not produced SIDs due to the low altitude of the sun and ionosphere instability. We did record a C2.8 flare on the 28th, although it has been a puzzle to analyse. The SWPC bulletin gives a start time of 11:49, maximum at 11:57, ending at 12:54UT. Our SID recordings are fairly consistent with a start around 12:40 and a peak between 12:44 and 12:50UT. These are over several frequencies, and so do seem to be genuine SID timings.



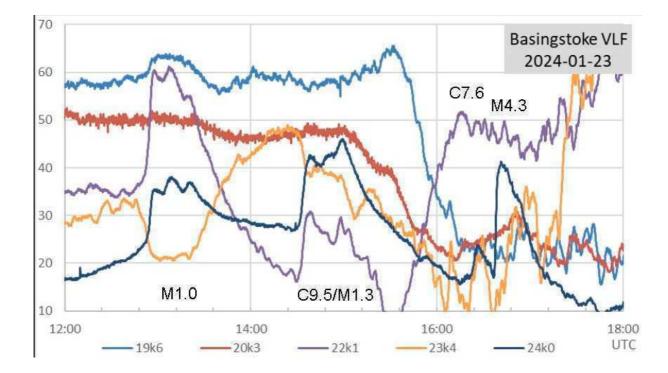
This recording by Colin Clements shows two of the stronger flares on the 11th. The M1.3 flare has produced a clean negative going SID at 23.4kHz, with a spike and wave type SID at 21.75kHz. The slightly smaller C9.4 flare appears to have produced spike and waves on both signals, although this could be from two peaks in the flare. Paul Hyde's recording showed a similar response. Most spike and wave SIDs have a much 'sharper' spike compared to the more symmetrical shape seen here. The background shows some gentle instability, not unexpected at this time of year.



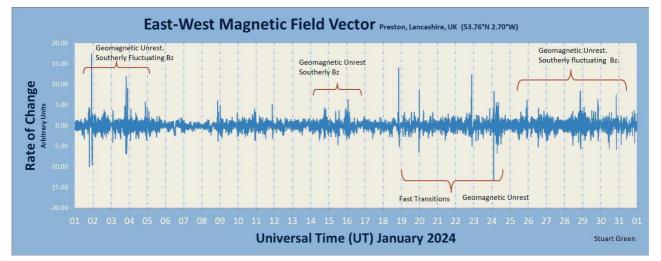
The M4.7 flare on the 1st was the strongest that we recorded in January. This recording by Mark Prescott shows a slow recovery after the peak on both signals. The start of the SID at 19.6kHz is very obvious, but barely visible at 22.1kHz. The recording by Mark Edwards shows a similar slow recovery at 21.75kHz (green trace), although other signals are much faster.



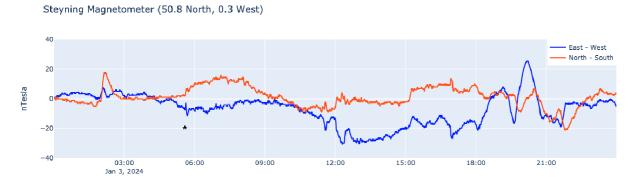
January 23rd was the most active day, with nine individual peaks identified. Many of these have merged together to give multiple-peaked SIDs. The recording by Paul Hyde on the next page shows the details. I have attempted to label them based on the SWPC X-ray satellite data. 24kHz (dark blue) shows the two later SIDs, while the European signals have gone into sunset.



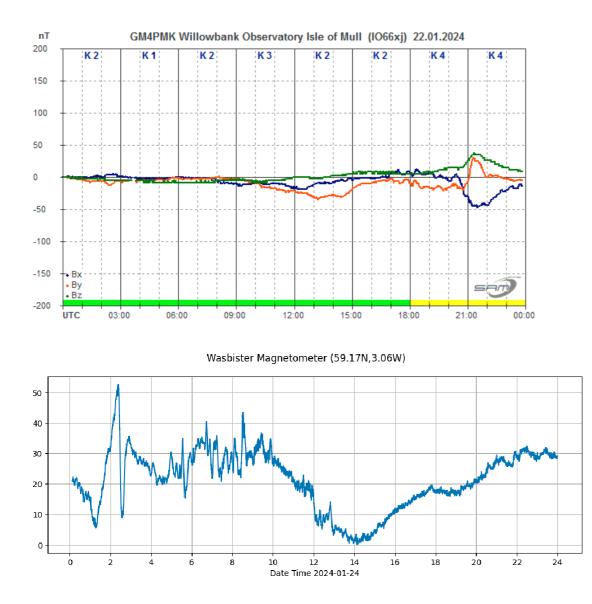
MAGNETIC OBSERVATIONS.



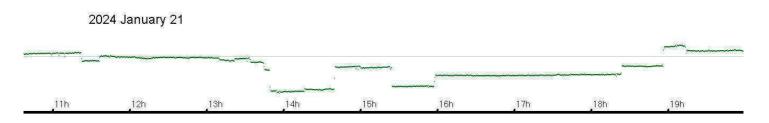
Stuart Green's monthly summary of magnetic activity shows a fairly quiet period, with some mild disturbance from solar wind. The STCE bulletin does mention that a pair of CME's from the end of December were recorded on January 3rd, with impacts at 04:50 and 14:25UT.



The first impact is marked '*' on this recording by Nick Quinn, rather later than reported, the second being much less clear. Recordings by Callum Potter also show the earlier impact but not the later one.



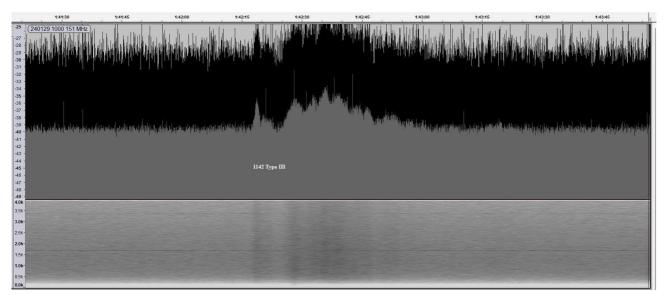
There was a very mild disturbance through the last week of January, starting in the evening of the 22^{nd} . Roger Blackwell's recording (top) shows less than +/-50nT, fading out after midnight. The lower chart from Callum Potter shows the disturbance continuing in the morning of the 24^{th} , again very mild.



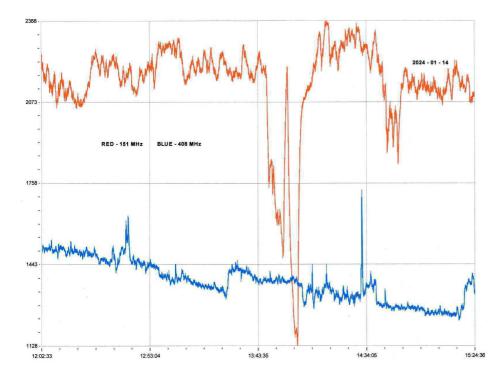
I have included my own recording from January 21st to show just how bad local magnetic interference can be. The grey line is the average though the day, the sensor recording +40 / -130nT, greater than the genuine activity recorded through the month. I have no idea what caused the problem, and just assume that it was from large vehicles in the road outside.

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

SOLAR EMISSIONS.



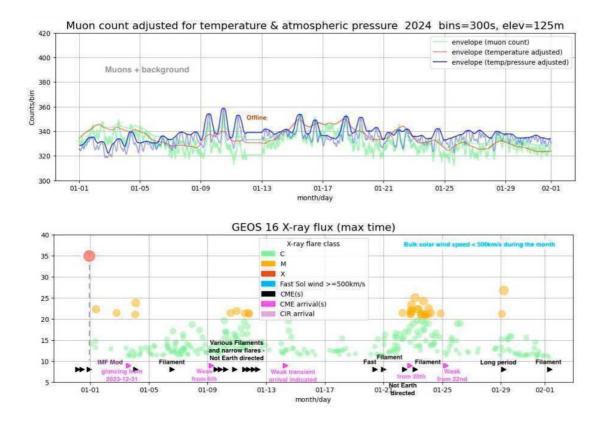
Colin Briden made this recording of a type III emission at 151MHz on the 29th. Timed at 11:42UT it lasted just under a minute with a peak amplitude 6dB above the noise floor. This matches the timing of a C2.8 flare listed in the SWPC bulletin, but not recorded as a SID. The very low winter altitude of the sun is probably responsible for the weak signal. Colin Clements recorded some unusual 151MHz behaviour on the 14th:



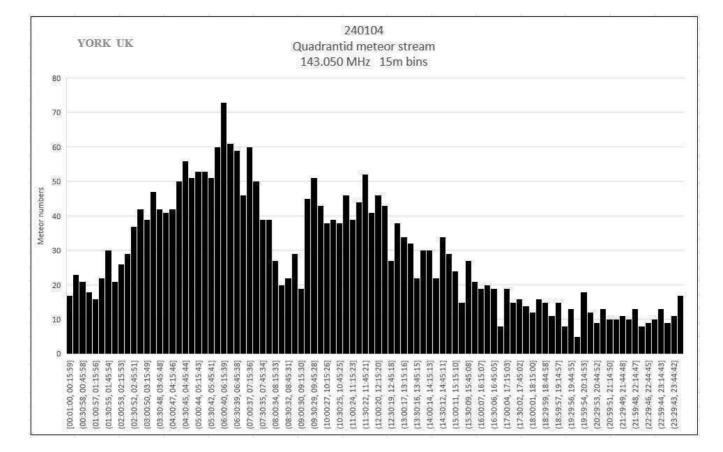
The sharp dip in 151MHz (red) occurs shortly after the C7.2 flare, with a rise at 408MHz over the same period. There may well also be some effects from the low sun causing the deep 151MHz dip.

MUONS.

Mark Prescott's recording of Muons shows increased levels during mid-month. These match similar behaviour in the Oulu cosmic-ray monitor.



The connection is not clear, but does seem to indicate a rise in counts as the solar wind speed drops.



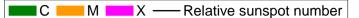
QUADRANTIDS.

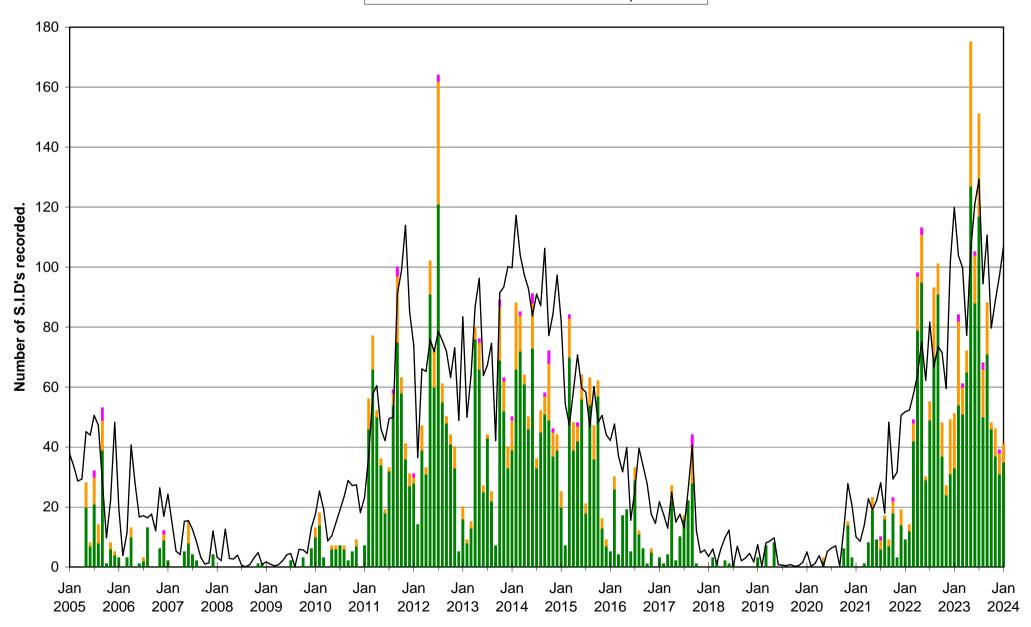
Colin Briden made recordings of the Quadrantid meteor shower using the GRAVES 143MHz signal. There is a clear peak in activity around 05:30 to 07:00UT, followed by a dip and secondary peak between 09:00 and mid-day on January 4th. The decay after this peak lasts through the afternoon, much slower than the rise in activity. The gap between the peaks matches the time when the shower radiant azimuth is in the same direction as the GRAVES aerial, so reducing its effectiveness. Unfortunately I have not received any other reports of Quadrantid activity.

Colin also reported some quite dramatic consequences of the severe storms in January. A trampoline from a neighbour's garden was launched over the fence and a garden shed, landing on his 38MHz aerial system. The aerial was wrecked, but has now been re-built, and the offending trampoline returned to its owner. I am glad that all of my own aerials are safely indoors.

Finally a reminder that the Radio Astronomy Section's programme of zoom meetings can be found on the BAA web site. Follow the link to the Radio Astronomy Section where there is another link to the programme list.

VLF flare activity 2005/24





BAA Radio Astronomy Section.

BARTELS DIAGRAM

ROTATION	KEY: DISTURBED. ACTIVE SFE						B, C, M, X = FLARE MAGNITUDE.						Sj	nodic ro (carrin		art											
2570	6 F	7	8	9	10	11	2253 12	13 C	14 C	15	16	17	18	19	20	21	22	23	24	25 C	26 CC	27	28 C	29 BCCC	30	31	1 C
2571	2022 Fet 2 F CC	oruary 3	4 CC	5	6	7	2254 8	9 C	10	11	12 MCCC	13	14 CCM	15	16	17	18	19	20	21	22	23	24	25	26	27	28 C
2572	2022 Ma 1 F CM	rch 2	3	4	5	6 C	2255 7 C	8	9	10	11 CCCC	12 C	13	14 M	15 CCMC	16	17	18	19	20 CC	21	22 CC	23 CCCC	24 C	25	26 C	27 C
2573	28	29 MCCC	30 CCCC	31	2022 Ap 1 CCCC		з CC	2256 4 C	5	6 C	7	8 CC	9 C	10	11	12 CBCC	13	14	15 MMCC	16 CCCM	17 CCCM	18	19	20 CMCC	21 CC	22 CMC	23 C
2574	24 F	25 MCCC	26 CCCC	27 CCC	28 CC	29 MCCM	30 MMXM	2022 M 1 CCCC	ay 2	3 MCX	4 BMCM	5 CMMC	6 CC	7 CC	8 CCC	9 C	10 CCX	11 CCMM	12 CCCM	13 CCCC	14 CCCC	15 C	16 CMC	17 CCCC	18 CCCC	19 CMMM	20 I CMM
2575	21 F CCC	22 CC	23 CC	24 CC	25 CCM	26 CC	27 CC	2258 28 CC	29	30	31	2022 Ju 1	ine 2	3	4	5	6	7	8	9 CC	10 CCMC	11 C	12	13 C	14 CCCC	15	16 C
2576	17 F CCCC	18 CCC	19 C	20 CC	21 C	22 CC	23 CC	2259 24 C	25 C	26	27	28	29	30	2022 Jul 1	y 2	3 BC	4 C	5 CC	6	7	8 M	9 CCCC	10 CCCC	11 CM	12 CCCC	13 CCC
2577	14 F CMCM	15 CCC	16 MCM	17 CCCC	18	19 C	20 CCCC	21	2260 22	23 CCCC	24 C	25	26 C	27 C	28	29	30	31	2022 Au 1	ugust 2 CC	3 C	4	5 CC	6	7	8	9
2578	10 F	11 C	12 CC	13 CCCC	14 C	15 CMMM	16 MCC	17 CCMM	2261 18 CMMM	19 MCCC	20	21 C	22 C	23	24	25 CCCM	26 CMMM	27 CMMM	28 CCMM	29 CMMM	30 CCCM	31 C	2022 S 1 CC	eptember 2 CCCC	3 CCCC	4 CCCC	
2579	6 F CC	7	8	9	10 C	11 CCCC	12 CCCC	13 CCCC	2262 14 MCCC	15	16 MM	17 M	18 CC	19 C	20 MCCC	21 M	22 CCCC	23 CCCM	24 CCCC	25	26 CCC	27 CCCC	28	29 CC	30 CCMM	2022 O 1 CC	2 CMMC
2580	2022 Oc 3 F CMMM	ober 4 M	5 C	6	7 CM	8 C	9 CCCCC	10 CM	2263 11 MMCC	12 CC	13 C	14 M	15 C	16 C	17	18 C	19	20 CC	21	22 CB	23	24 CC	25 C	26 C	27	28	29
2581	30 F	31	2022 No 1	vember 2	3	4	5	6 C	7 C	2264 8	9	10 C	11 MCCM	12 CC	13 C	14 C	15 CCC	16 CC	17 CC	18 CCC	19 M	20	21	22 CCC	23	24	25
2582	26 F	27	28	29 C	30	2022 De 1	cember 2 C	3 M	4	2265 5	6	7 C	8	9	10	11 C	12	13	14 MMMM	15 CMCM	16 MMMC	17	18 CC	19 CCC	20 M	21 C	22 C
2583	23 F CC	24 C	25	26 CCC	27 CM	28	29 CM	30 CCCM	31 C	2023 Ja 1	2	3	4	5	6	7 CC	8 MCCM	9 MM	10 MCMM	11 MC	12 MCMC	13 MC	14 CCC	15 CM	16 C	17	18 MC
2584	19 F MMC	20 CC	21 CC	22 CMCM	23 C	24 CCC	25 MCM	26 CMCC	27	28 C	2267 29	30 C	31 CC	2023 Fe 1	2 C	3	4 C	5 C	6 C	7 CC	8 CM	9 MMMM	10 MCCM	11 MMXM	12 MMMM	13 CCCM	14 CCM
2585	15 F CCCC	16 C	17 CX	18 C	19 CC	20 CMCC	21 MCCM	22 CCCM	23 CMCC	24 CCM	2268 25 CCMM	26 CC	27 CC	28	2023 Ma 1 CC	2	3 MCCX	4 CMMC	5 CCMC	6 MCCC	7 C	8 MC	9 CCC	10 CCCC	11 C	12	13
2586	14 F C	15	<mark>16</mark> C	17 CCCM	18 C	19 CCC	20 C	21 C	22	23	2269 24 C	25	26 CC	27 CCC	28 CC	29 MC	30 M	31 CC	2023 Ap 1	oril 2	3	4	5 CCC	6 MC	7	8 CC	9 CCCC
2587	10 F MCCC	11 MC	12 CCC	13 CCCC	14 CCMC	15 CCCC	16 C	17 CC	18 CCC	19 CCC	20 CCCC	2270 21 M	22 CC	23	24 CC	25	26 C	27 M	28 CC	29 CCCC	30 CCM	2023 M 1 CCMC	2	3 MMMM	4 MCCC	5 CMM	6 CC
2588	7 F C	8 CCCM	9 MCMM	10 MCCC	11 MCCM	12 CCCC	13 CCCC	14 C	15 C	16 CCCM	17 CCCC		19 MCCM	20 MMMM	21 CCCM	22 CCMC	23 CCMC	24 MCCM	25 CCMC	26 CCC	27 CCC	28 MC	29 C	30 MMMC	31 CMCM	2023 Ju 1 CCCC	2
2589	3 F CC	4 CCCC		6 CCCC	7 CMCC	8 CC	9 CM	10 C	11	12 CCCC	13 CCCC		15 CC	16 MCMM	17 CC	18 M	19 MC	20 CCMX	21 CMMC	22 CMCC	23 C	24 CCMC	25 CCCC	26 CCMC	27 CMCC	28 MCC	29 CCCM
2590	30 F CCCC	2023 Ju 1 CCCC	2	3 MCCC	4 MC	5 CCCM	6 CCM	7 MC	8 C	9 CCC	10 CCCC	2273 11 MMMM	12 MMCC	13 CCCM	14 MCCC	15 MMMC	16 MCMM	17 CCC	18 MMMM	19 CMCM	20 C	21 C	22 CC	23 CC	24 C	25 CCCM	26 CMCM
2591	27 F CMCC	28 CMCC	29 CCCM	30 MC	31 CMCC	2023 Au 1 MMMM	2	3 CMCC	4 CC	5 MMCX		2274 7 CMMX	8 MC	9 C	10	11 CCCC	12 CCCC	13 C	14	15 C	16 CC	17 CCC	18	19 C	20 CC	21 CC	22
2592	23 F CCC	24 C	25 C	26 C	27	28	29	30 C	31	1	eptembe 2 MC	3 MCC	4 CC	5 MCC	6 CCCC	7 CCM	8 CCC	9 C	10 C	11 CCCM	12 MCCC	13 C	14 CCM	15 C	16 CC	17 C	18 C
2593	19 F MCCC	20 CMCC	21 M	22 CCMM	23 CCCC	24 CCMC	25 C	26 CC	27	28 MCC	29 CCC	30 CCCM	2023 Oc 1 CCCC	2	3 CCCC	4 C	5 C	6 CC	7 CC	8 CC	9 CCC	10 CMCC	11 CC	12	13	14 C	15 C
2594	16 F CCC	17	18	19 C	20 C	21	22	23	24	25 CC	26 CC	27		29 CCCC	30	2023 No 1 MCM	2 CCM	3	4	5 MCM	6 C	7	8 C	9 C	10 C	11 CCC	12
2595	13 F C	14 CCCC	15 C	16	17	18 CM	19 CC	20 MCCC	21 CCCC	22	23 CCMC	24 MC	2278 25	26 C	27	28	29 C	30	2023 De 1 CC	ecember 2	3	4	5 CCC	6 C	7	8	9 MCM
2596	10 F CCC	11 CCCC	12 CC	13 C	14 MMX	15 MCCM	16 CC	17 C	18 C	19	20	21	2279 22	23	24 MM	25	26	27	28	29	30 C	31 CCCC	2024 Ja 1 M	anuary 2	3	4	5
2597	6 F C	7	8 CC	9	10 CM	11 CCM	12 C	13	14 CC	15	16	17	2280 18	19	20 C	21 CCC	22 C	23 CMMM	24 CCC	25 CCCC	26	27	28 CCC	29 CCC	30 C	31 C	1

BAA Radio Astronomy Section.

2024 JANUARY.

	SS	S	John C	ook (23.	4kHz/22.	1kHz)	Roberto Battaiola 20.3kHz	Paul I	Hyde (22	.1kHz/24k	Hz)	Mark Ec	lwards (2	24.0/18.2/	22.1k)	Col	in Cleme	nts (23.4kHz	:)
	Xray class	Observers			quency re me aerial.		Modified AAVSO receiver.	Spectru	um Lab / aei	PC 1.5m f ial.	rame	Spectrun	n Lab / P	C 2m loop	o aerial.	Tuned Radio Frequency receive 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	M4.7	7	12:17	12:26	?	-		12:13	12:23	13:21	2+	12:16	12:26	13:13	2+				
6	C7.1	2						15:31	15:36	15:41	1-	15:34	15:35	15:45	1-				
8	C7.3	1										09:49	09:52	10:00	1-				
8 10	C5.7 C5.2	1 1										15:48 10:05	15:53 <i>10:0</i> 8	16:06 <i>10:29</i>	1- 1				
10	M1.4	6	12:45	12:51	13:09	1		12:43	12:53	13:18	2	12:45	12:55	13:31	2+				
11	C4.2	3	11:31	11:35	11:45	1-						11:30	11:36	11:45	1-				
11 11	C9.4 M1.3	6 7	12:01 12:48	12:09 12:52	12:28	1+ 1-		11:59 12:45	12:10 12:51		2 1-	12:04 12:48	12:12 12:52	12:20 13:03	1- 1-	12:01 12:47	12:12 12:53	12:31 13:03	1+ 1-
11	?	1	12.40	12.52	10.02	1-		12.45	12.51	10.00	1-	13:04	13:05	13:09	1-	12.47	12.00	10.00	1-
11	?	1										13:45	13:48	14:14	1+				
12	C5.9 ?	3	10:05	10:08	10:16	1-		10:04	10:06	10:18	1-	10:04	10:08	10:26	1				
14 14	، C9.6	1 4										11:48 12:05	11:59 12:09	? 12:33	- 1+	12:08	12:14	12:17	1-
14	C7.2	6	13:05	13:08	13:17	1-		13:02	13:08	13:18	1-	13:05	13:10	13:21	1-	12:58	13:08	13:24	1+
20	C5.2	1										14:30	14:36	14:52	1				
21 21	C2.5 C2.2	2 1						11:34	11:37	11:53	1	11:34 15:25	11:38 15:26	11:44 15:32	1- 1-				
21	C2.2	1										16:20	16:23	16:32	1-				
22	C7.0	4	11:15	11:22	11:41	1+		11:15	11:26		2+	11:11	11:27	?	-				
22	?	2	00.40	00.00	00.44	4		12:10	12:20	12:44	2	12:04	12:21	12:43	2				
23 23	C6.2 C3.7	1 1	09:13 10:06	09:26 10:09	09:41 10:13	1+ 1-													
23	C3.6	2	11:05		11:18	1-						11:02	11:09	11:19	1-				
23	C2.6	1	11:57	12:00	12:15	1-													
23 23	? M1.0	1 7	12:44	12:59	13:47	2+		12:49	12:58	12.54	2+	12:55 13:06	12:58 13:09	? ?	-	12:53	13:12	13:50	2+
23	?	2	12.44	12.55	13.47	27		12.45	12.50	13.34	27	13:19	13:23	, 13:37	- 1-	12.55	13.12	13.30	27
23	C9.5	2						14:31	14:38	15:22	2+	14:32	14:39	?	-				
23	?	1										14:46	14:51	?	-				
23 23	M1.3 C7.6	1										14:42 16:22	15:00 16:28	15:48 ?	2+				
23	M4.3	1										16:38	16:43	17:15	2				
24	C5.9	6	12:17	12:22	12:33	1-		12:12	12:23	?	-	12:16	12:25	12:35	1				
24 24	C6.8	5 1	12:48	12:59	13:17	1+		12:45	12:55	13:40	2+	12:48	13:02 15:26	13:16 ?	1+				
24 24	?	1										15:20 15:30	15:20	?	-				
24	?	1										15:40	15:42	?	-				
24	C2.4	1										15:52	15:55	16:10	1-				
25 25	? C3.4	1 1										10:29 10:42	10:35 10:56	? ?	-				
25	?	1										11:00	11:01	11:10	1-				
25	C4.2	2	14:03		14:17	1-						14:02	14:06	14:18	1-				
25 25	C5.1 C5.5	2 1	14:58	15:04	15:12	1-						14:59	15:09	? 15:30	- 1-				
25	?	1										15:17 11:25	15:22 11:27	15:30 11:31	1-				
28	C2.8	7	12:40	12:45	12:53	1-		12:38	12:45	13:01	1	12:42	12:48	12:54	1-				
28	C3.2	2						15:22	15:30	15:46	1	15:23	15:29	15:39	1-				
28 29	C3.0 C5.4	1 5	10:16	10:17	10:22	1-		10:12	10:19	10:26	1-	15:58 10:15	16:02 10:18	16:17 10:25	1 1-				
29	C5.1	5	10:35	10:38	10:22	1-		10:12	10:36	10:20	1-	10:15	10:18 10:38	10:23 10:44	1-				
29	C6.0	4	14:54	14:57		1-		14:49	14:54	15:10	1	14:55	14:57	15:07	1-				
30 21	C5.7	2 2						17:34	17:39	17:49	1-	17:36	17:41	17:49	1-				
31	C2.3	2										13:44	13:47	13:54	1-				

BAA Radio Astronomy Section.

2024 JANUARY.

	ss	I	Steve	e Parkins	son (Vario	us)	Andrew	Thomas (18.3kHz/19.	6kHz)	Pł	nil Rourke	(23.4kHz)		Mark Pro	escott (2	2.1kHz/19	.6kHz)	Jo	hn Elliott	(19.6kHz)	
	Xray class	ſ	Tuned radio frequency receiver, frame aerials.						ency receiver aerial.	r, 0.6m	Spectru	m Lab, 0	6m frame aeri	ial.			ab/Starbas -whip aeria		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 6 8 8	M4.7 C7.1 C7.3 C5.7		12:14	12:17	12:35	1	12:15	12:31	13:24	2+					12:19	12:34	13:10	2+	12:15	12:30	13:20	###
10 10	C5.2 M1.4		12:44	12:53	13.13	1+	12:44	12:52	13:07	1					12:48	12:55	13.45	2+				
11	C4.2						11:28	11:35	11:44	1-					12.40	12.00	13.45	21				
11 11 11 11	C9.4 M1.3 ? ?		12:01 12:48	12:07 12:52	12:25 13:02	1 1-	11:59 12:46	12:08 12:52	12:27 13:04	1+ 1-					12:52	12:57	13:15	1				
12 14	C5.9 ?																					
14 14 20	C9.6 C7.2 C5.2						11:48 13:04	11:57 13:10	12:12 13:24	1 1					11:45 13:07	12:11 13:13	12:58 13:24	2+ 1-				
21 21 21 22	C2.5 C2.2 C2.9 C7.0														11:20	11:27	?	-				
22 23 23 23 23 23	? C6.2 C3.7 C3.6 C2.6																					
23 23 23 23 23 23 23 23 23	? M1.0 ? C9.5 ? M1.3 C7.6		12:52	12:58	13:50	2+	12:47	13:05	13:45	2+					12:58 ?	13:02 13:13	? 13:30	-				
23 24	M4.3 C5.9	_	12:16	12:23	12:35	1	12:16	12:24	12:42	1+					12:19	12:28	12:47	1+				
24 24 24 24 24 24	C6.8 ? ? C2.4		12:47	13:00	13:16	1+									12:49	13:04	13:19	1+				
25 25 25 25 25	? C3.4 ? C4.2 C5.1																					
25 28 28 28 28 28	C5.5 ? C2.8 C3.2 C3.0		12:41	12:45	12:55	1-	12:37	12:45	13:01	1	12:38	12:44	13:01 1	1	12:44	12:50	13:02	1-				
29 29 29 30	C5.4 C5.1 C6.0 C5.7		10:15 10:37	10:18 10:38		1- 1-					10:16 10:36	10:18 10:39		1- 1-	14:56	15:01	15:09	1-				
31	C2.3		13:40	13:47	13:52	1-																