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BAA Radio Astronomy Section.

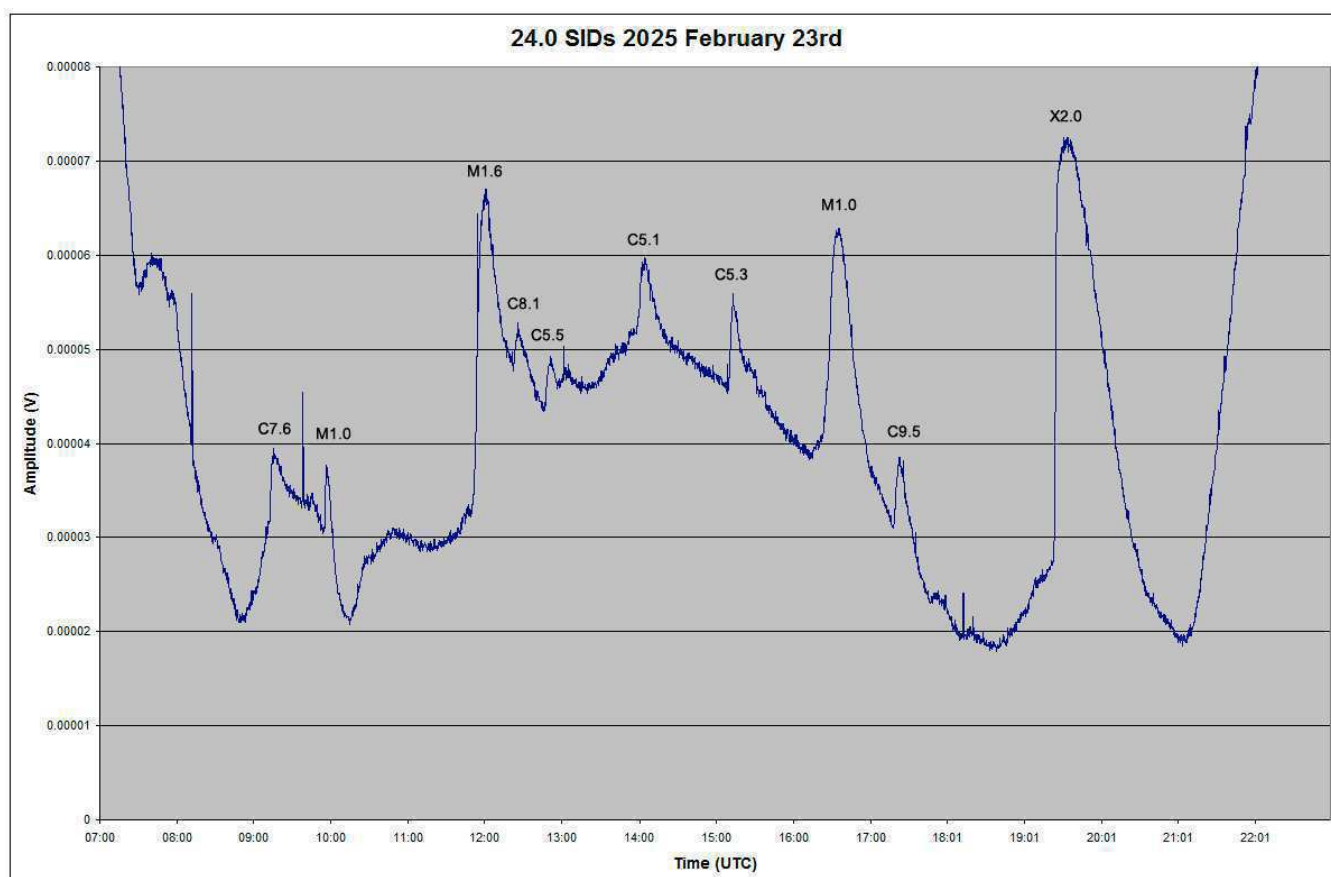
Director Paul Hearn.

RADIO SKY NEWS

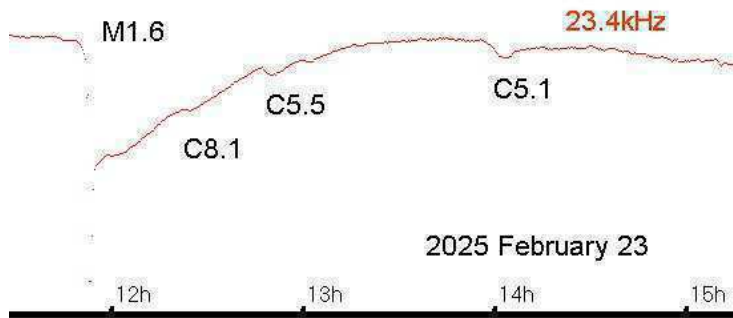
2025 FEBRUARY.

VLF SID OBSERVATIONS.

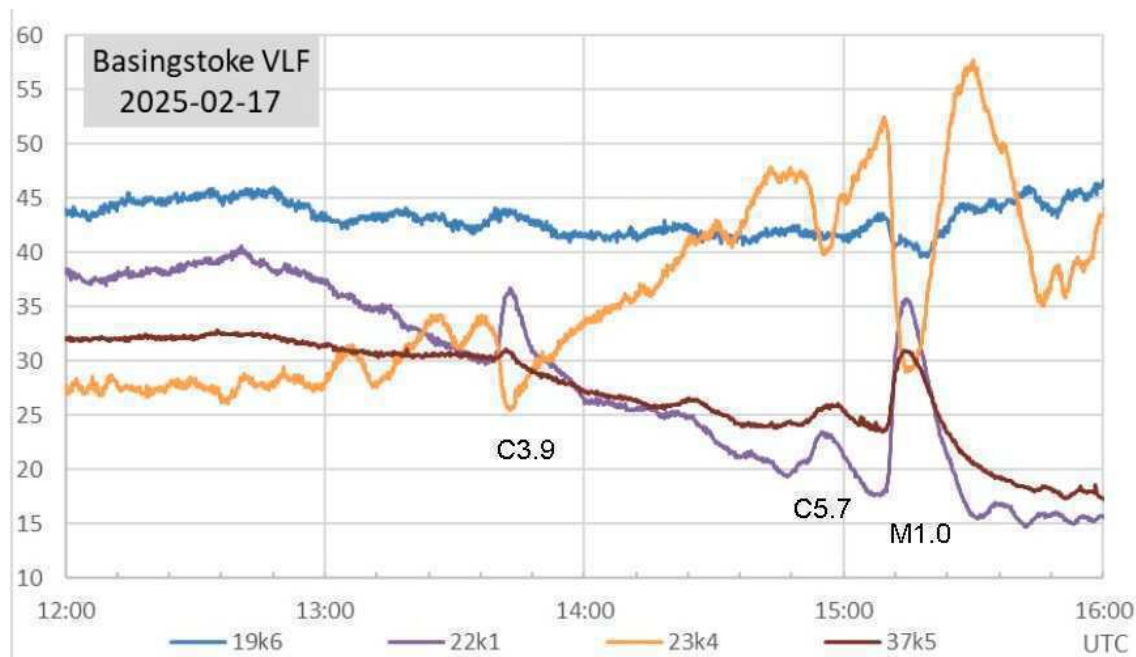
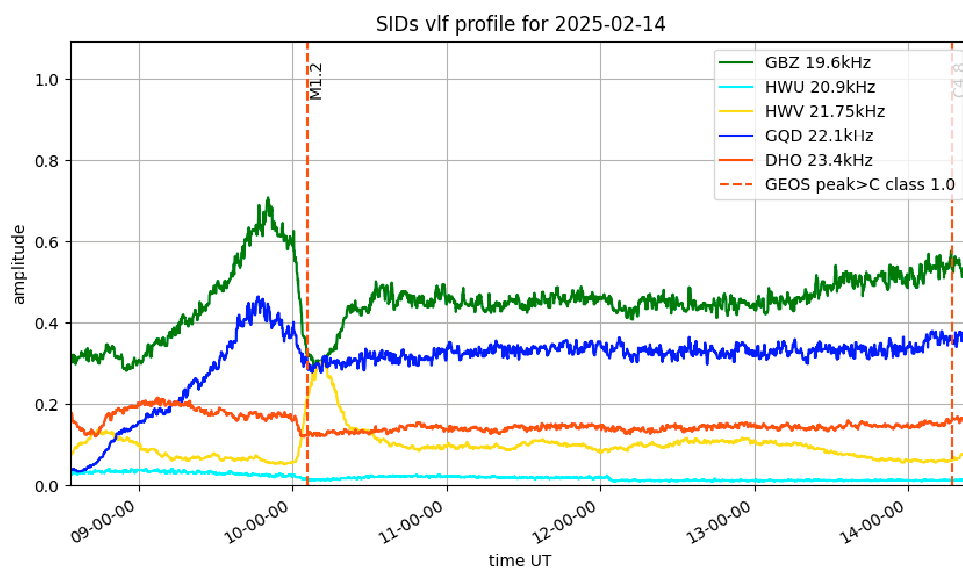
Solar flare activity increased in February, back up to the level last seen in 2024 November. We recorded SIDs from 80 classified flares, including a single X-flare. This was the only one shown in the satellite data, and we were lucky to record it on the 24kHz signal peaking at 19:32UT on the 23rd. This was also the most busy day of the month, shown in Mark Edwards' 24kHz recording:



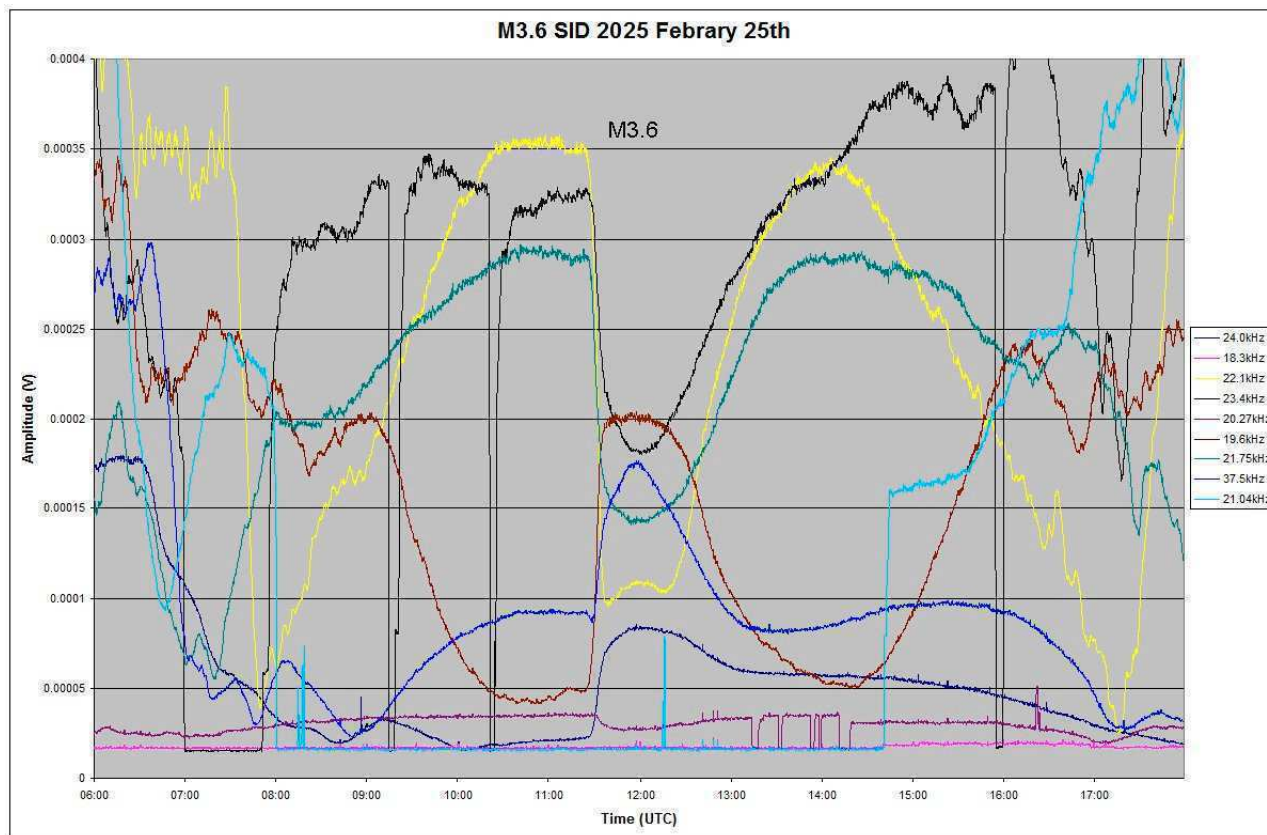
The Satellite flare list in the SWPC weekly report does not include the four peaks shown in Mark's chart between 12:20UT and 16UT. They have been classified here by reference to the daily X-ray chart on the SWPC web site. I indicate these in the timing tables with '?', as the X-ray chart covers a maximum of seven days, well past by the time that I am analysing our reports. They are however often significant flares, the C5.1 at 14:05 producing SIDs for eight of our nine observers.



My own 23.4kHz recording also shows these events following the strong M1.6 flare. The M1.6 SID is slightly distorted by a transmitter glitch just as it starts. Flaring activity faded from the 9th for several days, increasing again after the 13th. Mark Prescott's recording shows a single SID from the M1.2 flare just after 10UT on the 14th. The rest of the day is very flat, with minimal effects from the C4.8 flare at the end of the chart.

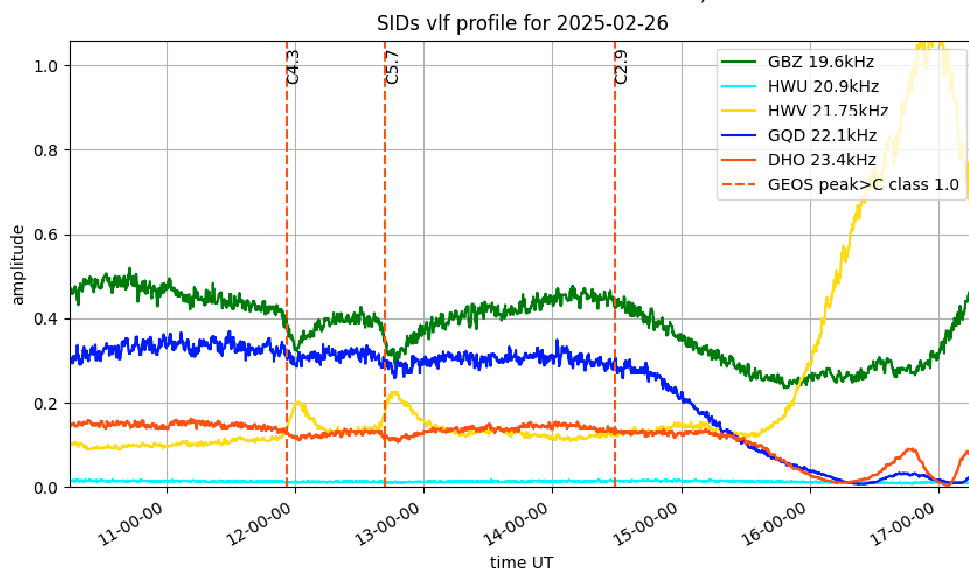


Paul Hyde's recording from the 17th shows a very disturbed 23.4kHz signal. 22.1kHz and 37.5kHz are much clearer, and show the three flares. The C4.4 flare just before 16UT does not show, the rise at 23.4kHz being most likely the start of sunset.



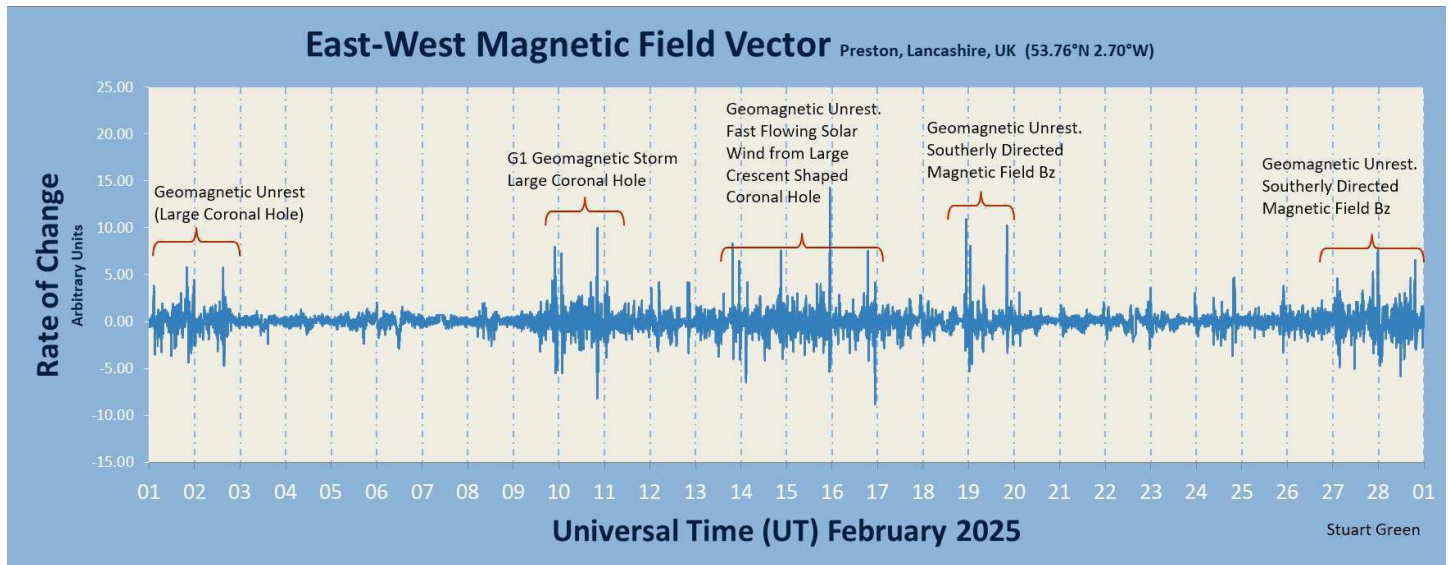
Mark Edwards' recording from the 25th shows the M3.6 flare, well timed at midday. It also shows more problems with 23.4kHz, with a series of drop-outs following the usual 7–8 break. 22.1kHz shows a small 'spike-and-wave' SID, while the other signals have the normal 'shark's fin' SID.

There was a series of smaller flares on the 26th, shown in the recording by Mark Prescott:



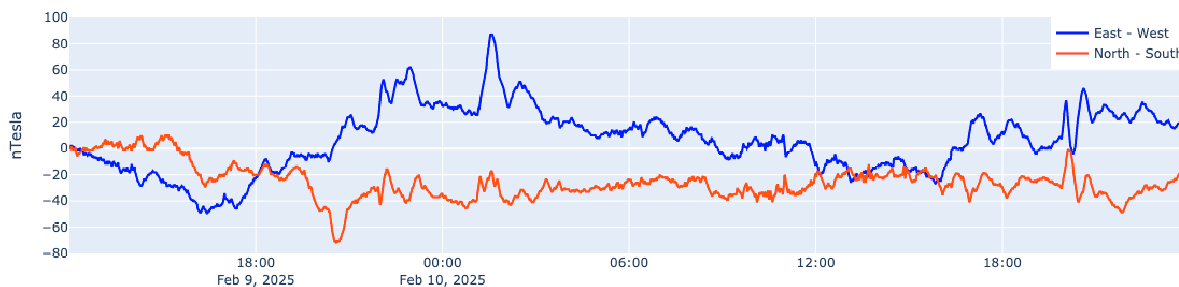
Both the C4.3 and C5.7 show well, and there is perhaps a small hint of a SID at 13:30 for the unclassified flare on the 19.6kHz signal.

MAGNETIC OBSERVATIONS.

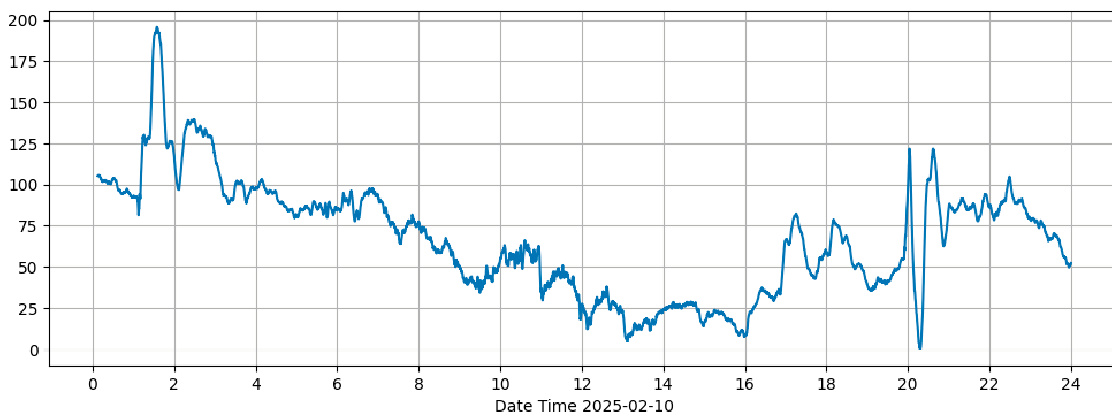


Stuart Green's summary of magnetic activity in February shows some disturbance on most days. Our SID statistics include plenty of M-class flares, but CMEs seem to have been very mild and mixed in with strong solar winds from coronal holes. The satellite images seem to show that most CMEs were directed well away from the Earth. None of our recordings show any sign of a distinct CME arrival. Some the strongest disturbance was over the 9th to 11th, the recording by Nick Quinn showing its start:

Steyning Magnetometer (50.8 North, 0.3 West)

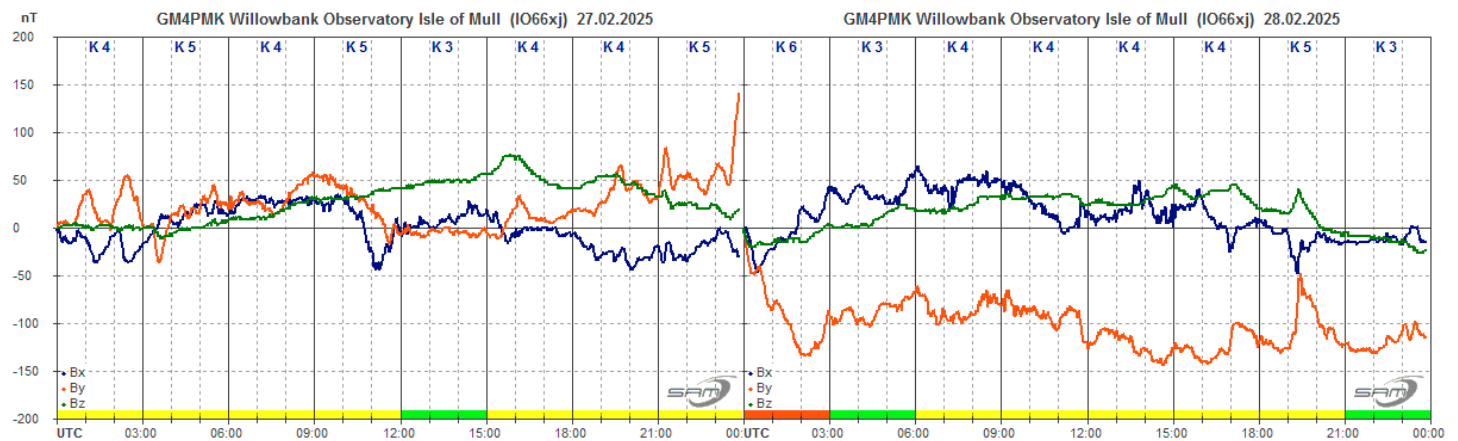


Wasbister Magnetometer (59.17N,3.06W)

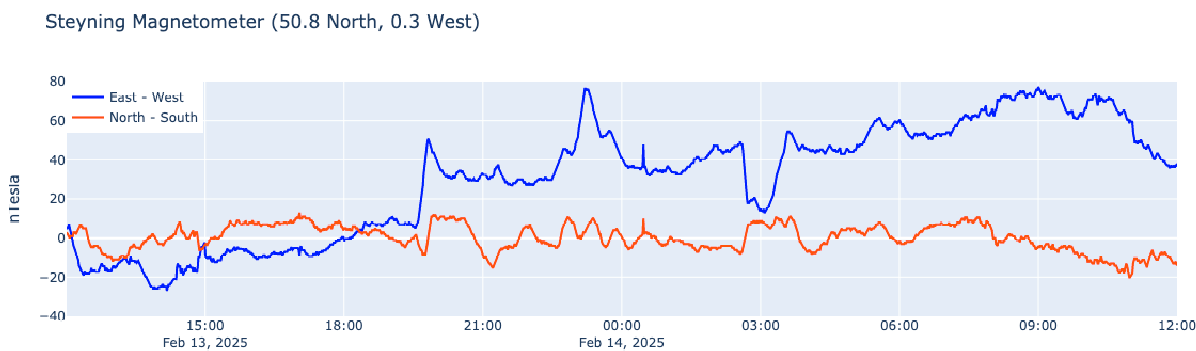


Callum Potter's recording on the 10th is similar, but with greater amplitude.

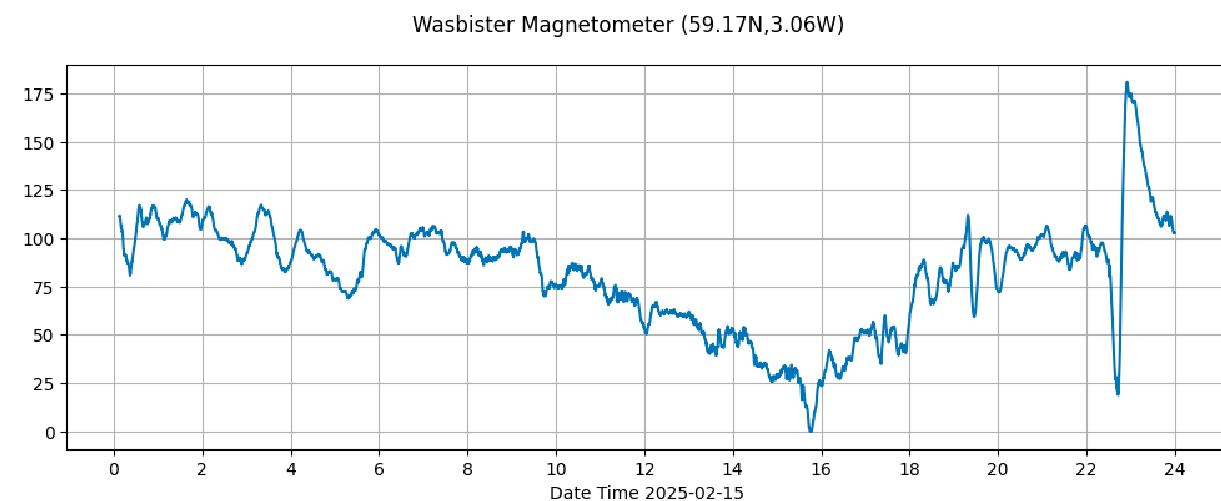
The most active period was at the end of the month, shown here by Roger Blackwell:



This shows the 27th and 28th, the large disruption in the By (red) trace being due to a sensor reset at midnight. The Earth – Solar magnetic field alignment at this time of year allows the best interaction (an ideal time for aurora watching) and so maximises the effect that the solar wind has.

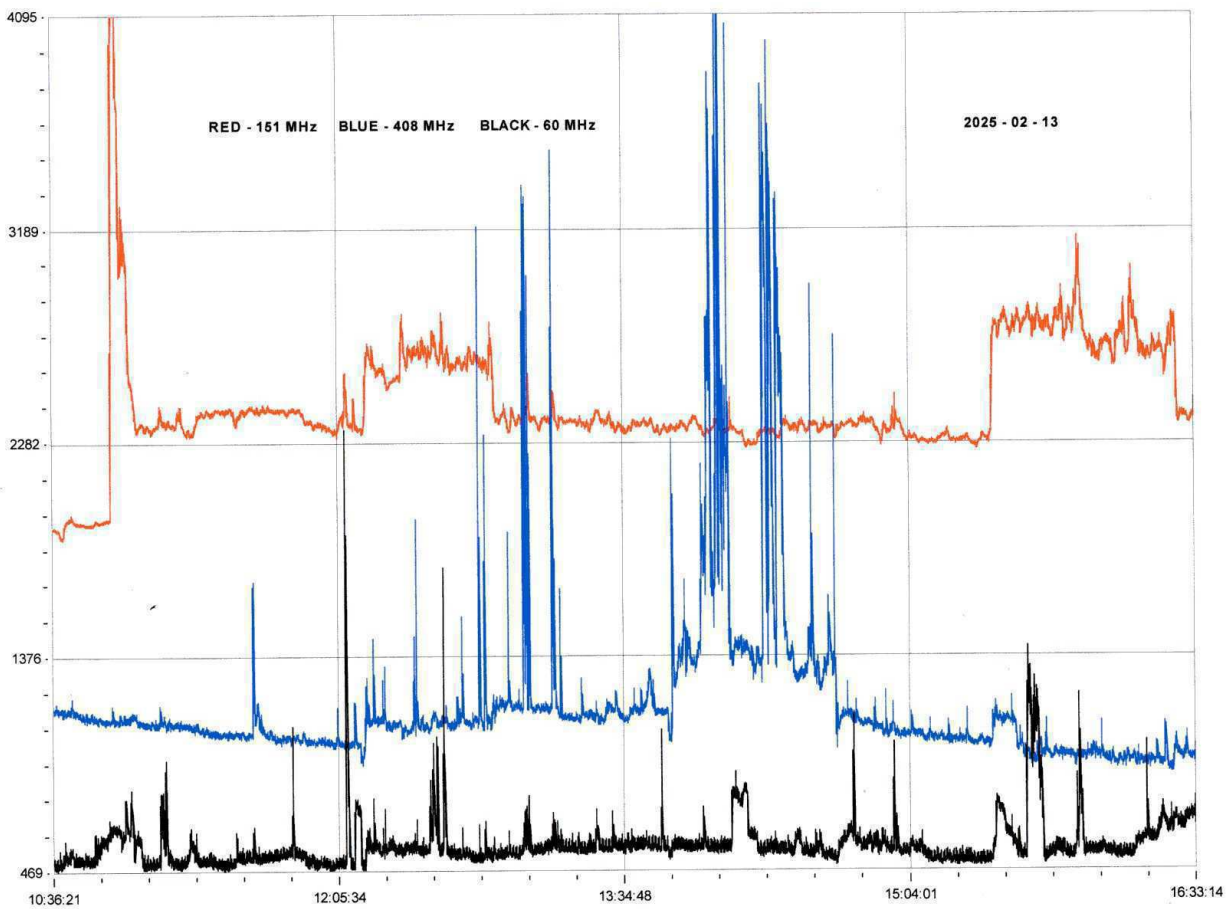


Solar wind from a large coronal hole produced another period of disturbance mid-month, Nick Quinn's recording showing the 13th and 14th. There is a sharp field change around 19:30 on the 13th, although I have not found any reference to a CME impact at this time. A similar effect is seen in charts from other observers. The disturbance continued for several days, Callum Potter's recording showing more activity on the 15th.

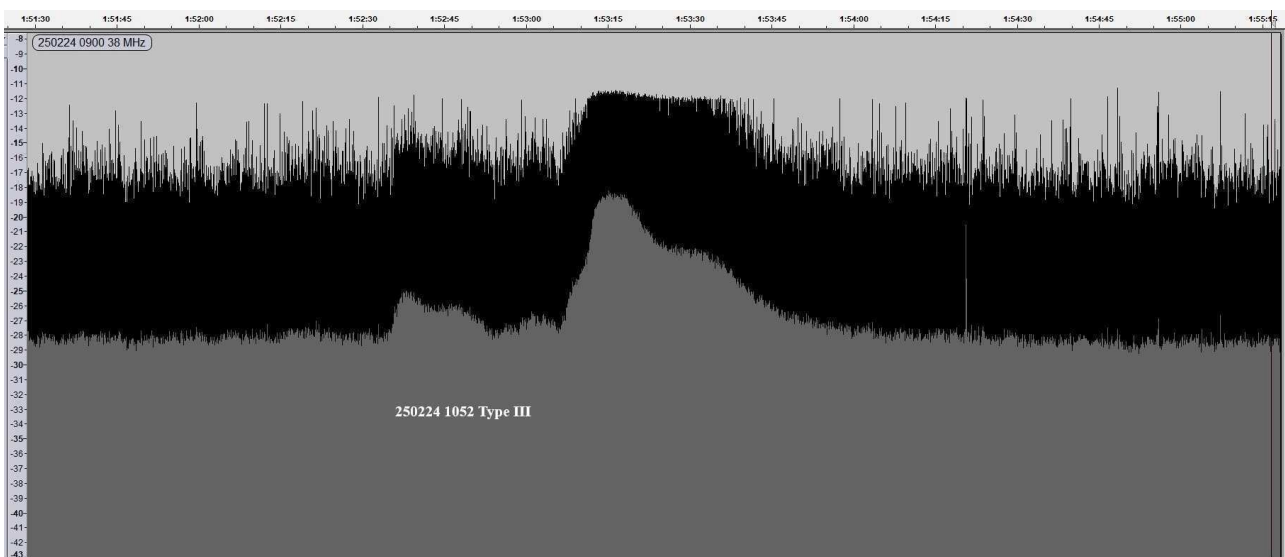


Magnetic observations received from Roger Blackwell, Stuart Green, Callum Potter, Nick Quinn and John Cook.

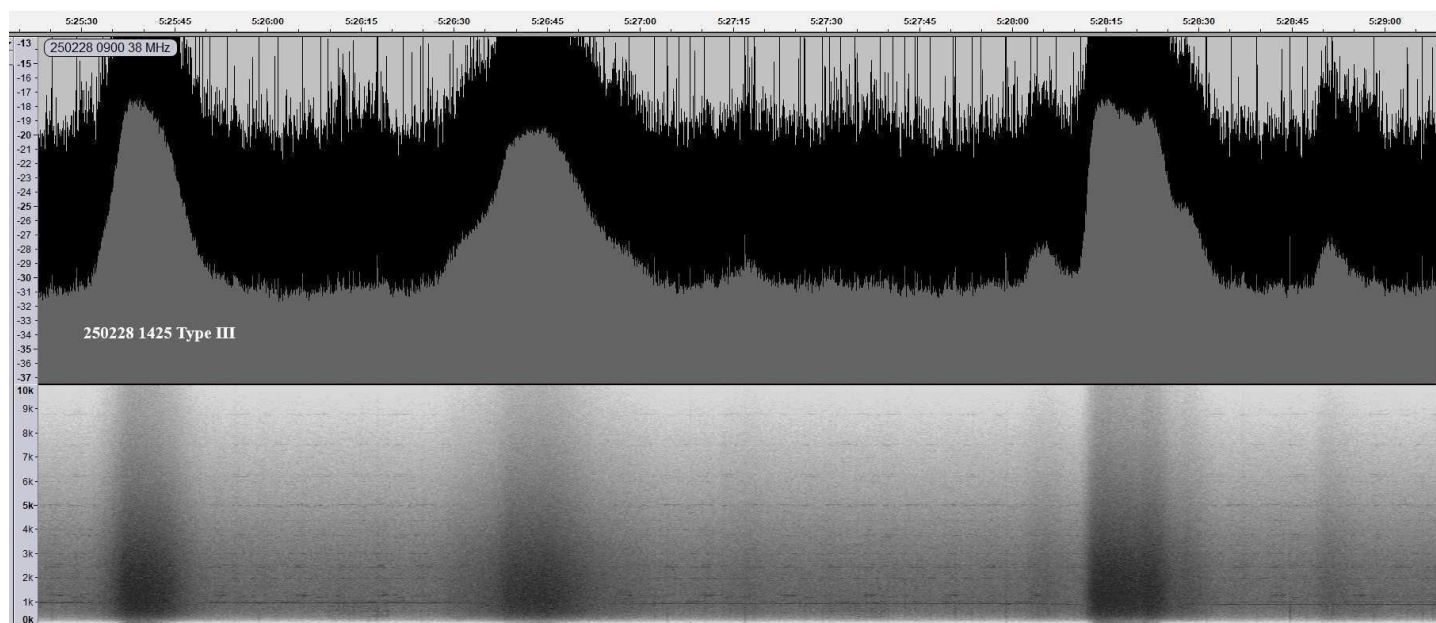
SOLAR EMISSIONS



Colin Clements' HF/VHF recording from the 13th shows some strong activity, particularly at 408MHz (blue). The strong spike at 151MHz (red) may be related to the M1.0 flare peaking at 11:10. There is also a small response at 60MHz (black). The 408MHz signal starting just after 12UT matches the C3.3 and C3.2 flares that we recorded, while the source of the stronger burst after 14:00 is unknown.

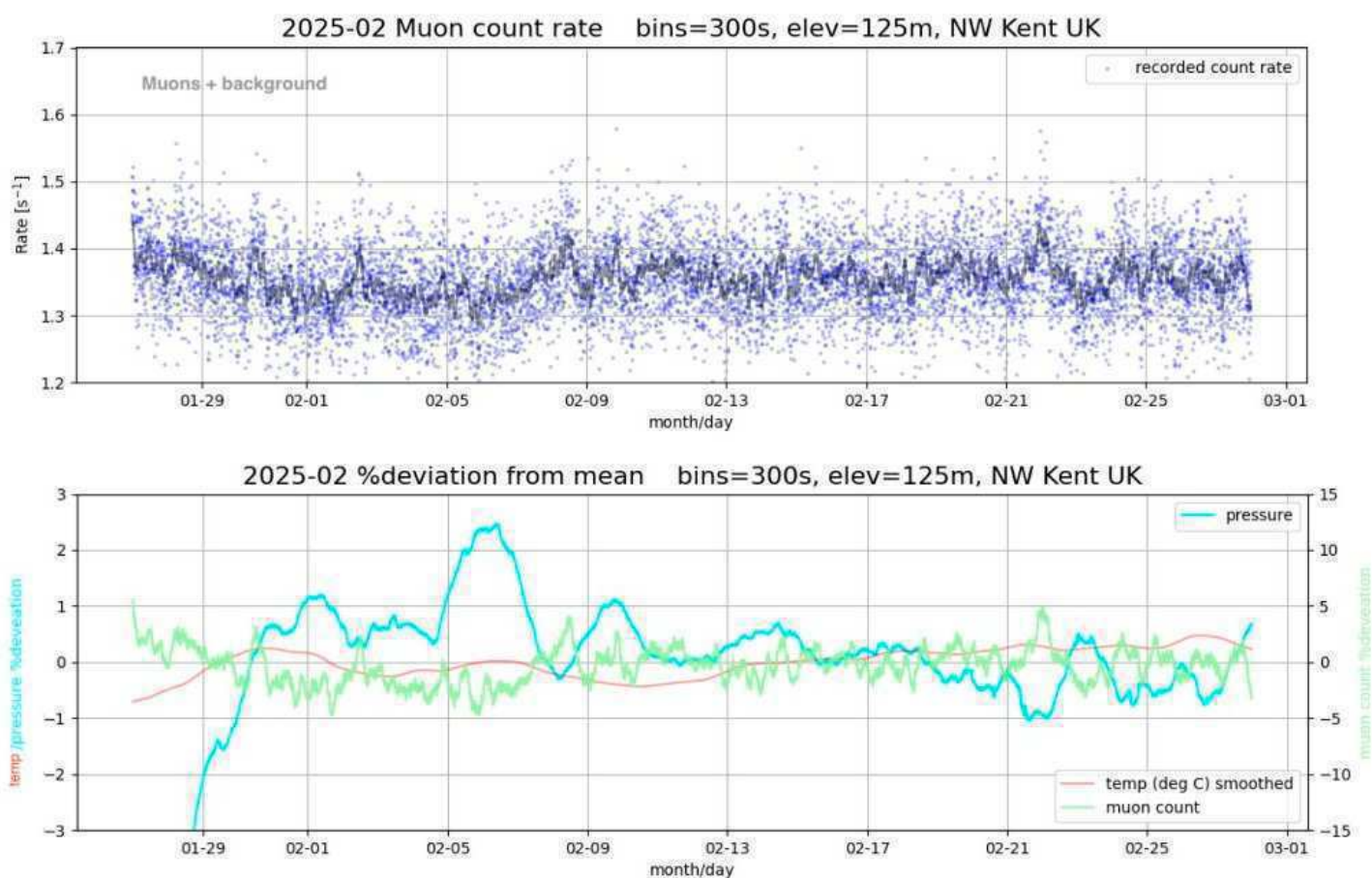


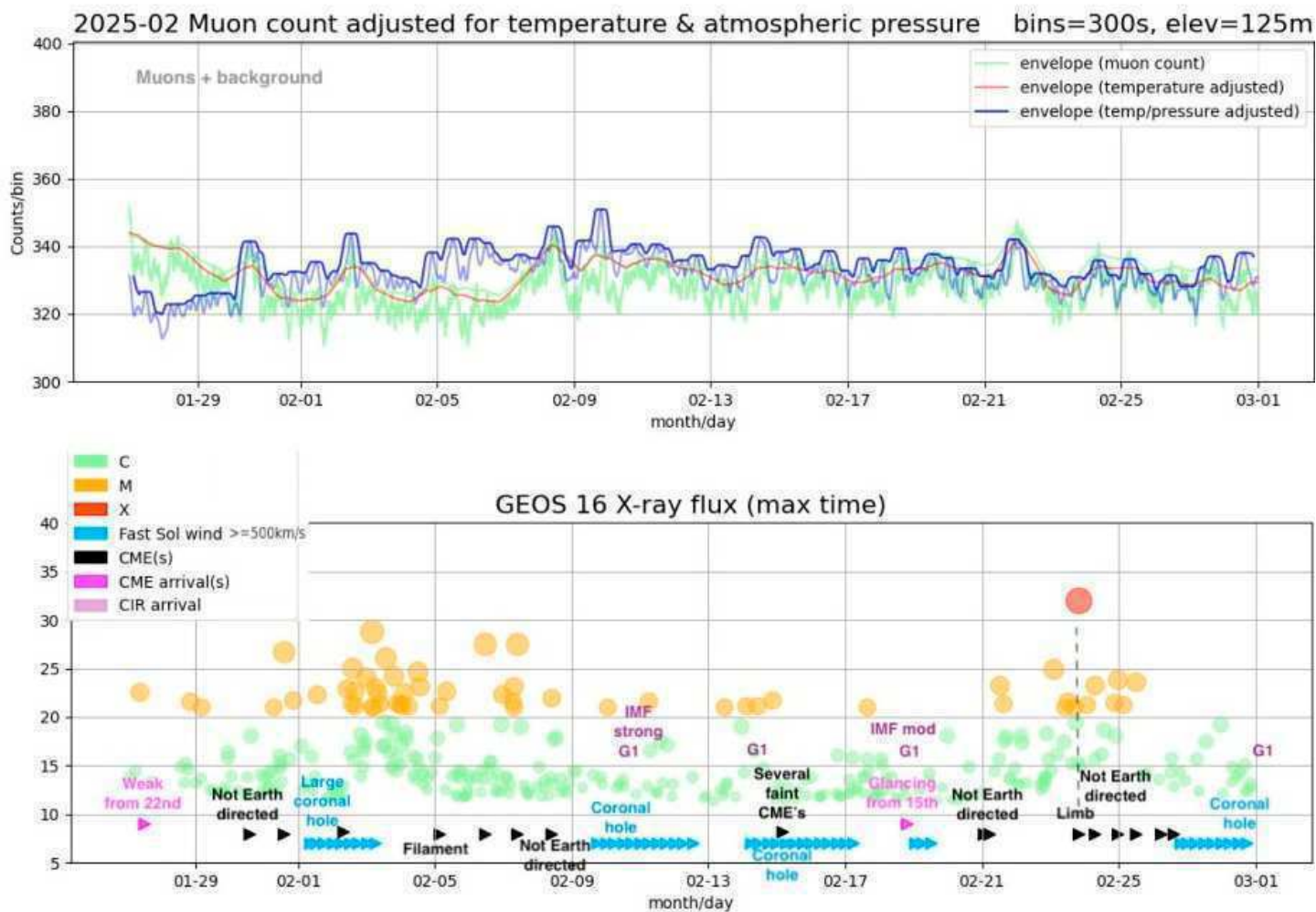
Colin Briden's 38MHz recording from the 24th shows a type III emission starting at 10:52UT and lasting about 90 seconds with an amplitude of 10dB.



His recording from the 28th starts at 14:25, with a series of peaks over a period of 3 minutes with an amplitude of 12dB. This type III emission is the start of a run of 13 similar peaks that make a type VI emission. The lower part of the chart shows the noise over a 10kHz bandwidth.

MUONS

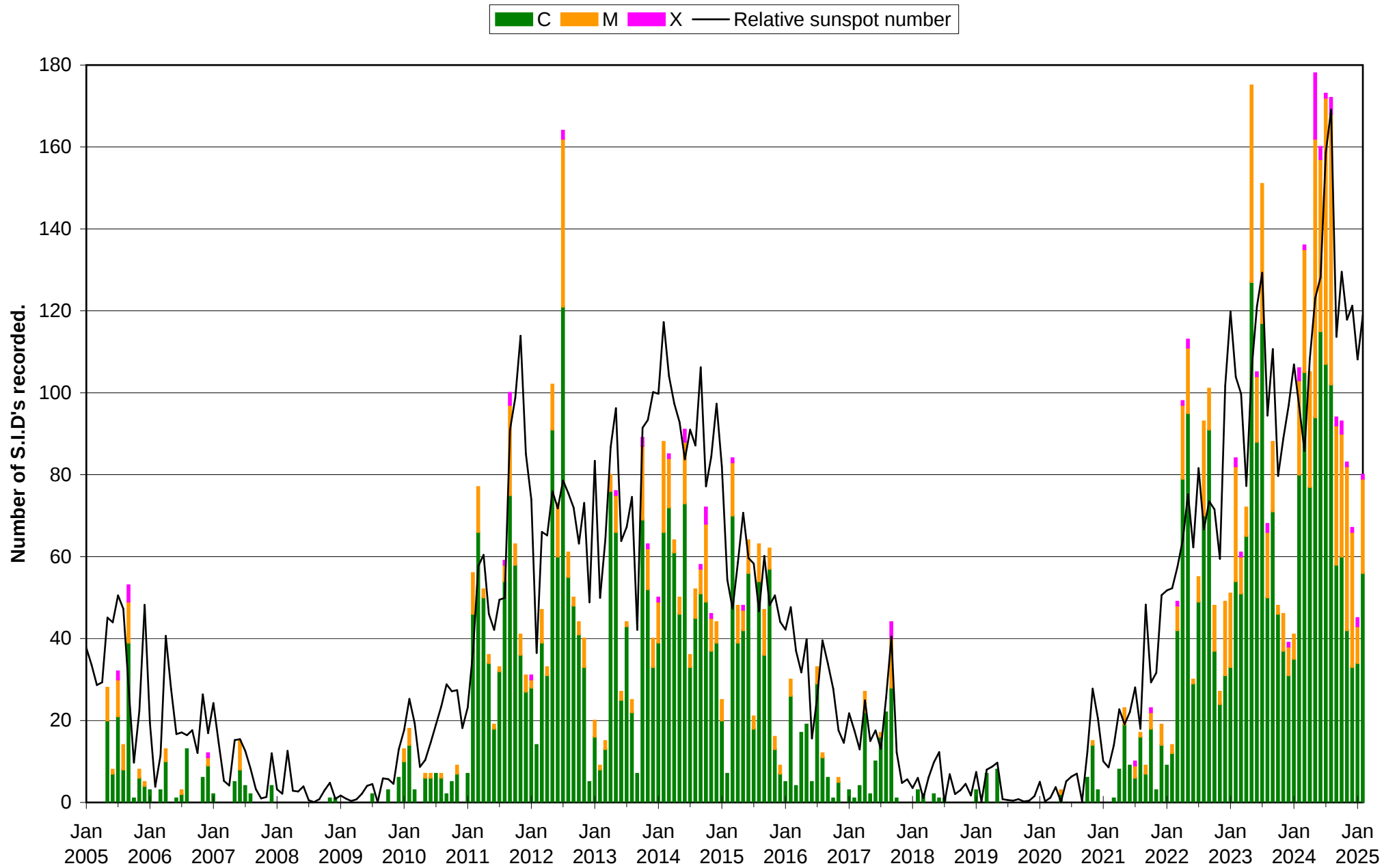




Mark Prescott's muon charts show a gentle rise at the start of February, following the drop at the end of January. Atmospheric pressure also increased on the 1st, then remaining rather unstable through the rest of the month. The muon counts generally reflect this behaviour. They also seem to drop during the period of strong flaring over the 2nd to 5th. The coronal hole solar wind was also more active after the 10th, with a gentle drop in the muon flux recorded up to the end of the month.

The partial solar eclipse on March 29th offers about 40% cover over the UK, the maximum being around 11UT depending on location. I very much hope that the clouds behave and stay out of the way. Our VLF and HF/VHF observations should not be affected either way, but it will be good to watch how the environment responds to the changing light.

VLF flare activity 2005/25



BARTELS DIAGRAM

ROTATION	KEY:	DISTURBED.	ACTIVE	SFE	B, C, M, X = FLARE MAGNITUDE.	Synodic rotation start (carrington's).
2575	F	21 CCC 22 CC 23 CC 24 CC 25 CCM 26 CC 27 CC 28 CC 29 CC 30 CC 31 CC	2258	2258	2022 June	1 2 3 4 5 6 7 8 9 CC 10 CCMC 11 C 12 C 13 C 14 CCCC 15 C 16 C
2576	F	17 CCCC 18 CCC 19 C 20 CC 21 C 22 CC 23 CC 24 C 25 C 26 C 27 C 28 C 29 C 30 C 1 2 3 BC 4 C 5 CC 6 C 7 C 8 M 9 CCCC 10 CCCC 11 CM 12 CCCC 13 CCC	2259	2259	2022 July	
2577	F	14 CCMC 15 CCC 16 MCM 17 CCCC 18 C 19 C 20 CCCC 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 2 3 CC 4 C 5 CC 6 C 7 C 8 C 9	2260	2260	2022 August	
2578	F	10 C 11 CC 12 CCCC 13 C 14 C 15 CMM 16 MCC 17 CMM 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 CCM 26 CMM 27 CMM 28 CMM 29 CMM 30 CMM 31 C 1 CC 2 CCCC 3 CCCC 4 CCCC 5 CCCC	2261	2261	2022 September	
2579	F	6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 CC 2 CCCC 3 CCCC 4 CCCC 5 CCCC	2262	2262	2022 October	
2580	F	9 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C	2263	2263	2022 October	
2581	F	30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C	2264	2264	2022 November	
2582	F	26 C 27 C 28 C 29 C 30 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C	2265	2265	2022 December	
2583	F	23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C	2266	2266	2023 January	
2584	F	19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C	2267	2267	2023 February	
2585	F	15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C	2268	2268	2023 March	
2586	F	14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C	2269	2269	2023 April	
2587	F	10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C	2270	2270	2023 May	
2588	F	7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C	2271	2271	2023 June	
2589	F	3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C	2272	2272	2023 June	
2590	F	30 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C	2273	2273	2023 July	
2591	F	27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C	2274	2274	2023 August	
2592	F	23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C	2275	2275	2023 September	
2593	F	19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C	2276	2276	2023 October	
2594	F	16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C	2277	2277	2023 November	
2595	F	13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C	2278	2278	2023 December	
2596	F	10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C	2279	2279	2024 January	
2597	F	6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C	2280	2280	2024 February	
2598	F	2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C	2281	2281	2024 February	
2599	F	29 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C	2282	2282	2024 March	
2600	F	27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C	2283	2283	2024 April	
2601	F	23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C	2284	2284	2024 May	
2602	F	20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C	2285	2285	2024 June	
2603	F	16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C	2286	2286	2024 July	
2604	F	13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C	2287	2287	2024 August	
2605	F	9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C	2288	2288	2024 September	
2606	F	5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C	2289	2289	2024 October	
2607	F	2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C	2290	2290	2024 November	
2608	F	29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C	2291	2291	2024 December	
2609	F	25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C	2292	2292	2025 January	
2610	F	22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 C 17 C	2293	2293	2025 February	
2611	F	18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C	2294	2294	2025 March	
2612	F	14 C 15 C 16 C 17 C 18 C 19 C 20 C 21 C 22 C 23 C 24 C 25 C 26 C 27 C 28 C 29 C 30 C 31 C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C	2295	2295	2025 March	

2025 FEBRUARY.

			John Cook (23.4kHz/22.1kHz)				Roberto Battaiola 18.3kHz				Paul Hyde (22.1kHz/24kHz)				Mark Edwards (24.0/21.04/37.5kHz)				Colin Clements (23.4kHz/21.75kHz)			
	Xray class	Observers	Tuned radio frequency receiver, 0.58m frame aerial.				Modified AAVSO receiver.				Spectrum Lab / PC 1.5m frame aerial.				Spectrum Lab / PC 2m loop aerial.				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	C6.0	1													08:54	08:58	09:06	1-				
1	C2.4	1													10:00	10:04	10:09	1-				
1	C4.0	3	11:31	11:32	11:46	1-					11:30	11:34	11:39	1-	11:24	11:33	11:47	1				
1	M2.4	9	13:16	13:20	13:37	1					13:15	13:19	13:57	2	13:16	13:20	13:39	1	13:18	13:21	13:25	1-
2	M3.0	9	10:09	10:15	10:44	2					10:08	10:13	10:49	2	10:10	10:14	10:28	1-	10:00	10:08	10:13	1-
2	C6.5	5	11:57	12:00	12:05	1-					11:56	12:03	12:13	1-	11:56	12:02	12:22	1+				
2	?	1													12:05	12:07	12:12	1-				
2	M1.4	8	12:44	12:52	13:15	1+					12:46	12:49	13:10	1	12:45	12:54	13:08	1	12:45	12:59	13:19	2
2	C6.2	2	13:18	13:21	13:38	1									13:17	13:24	13:37	1				
2	M5.1	9	14:03	14:06	14:25	1					14:03	14:06	14:46	2	14:03	14:06	14:16	1-	14:03	14:07	14:13	1-
2	C5.6	1	15:02	15:05	?	-																
2	M1.2	2	15:10	15:14	15:19	1-									15:10	15:14	15:19	1-				
2	M2.7	7	15:24	15:35	15:48	1					15:23	15:34	15:42	1	15:27	15:28	15:38	1-	15:14	15:24	15:29	1-
3	M1.4	3									09:09	09:14	09:17	1-	09:11	09:14	09:17	1-				
3	C7.1	1													10:59	11:06	11:13	1-				
3	?	1													11:18	11:21	11:32	1-				
3	C9.5	5	11:44	11:49	11:57	1-					11:43	11:49	12:04	1	11:45	11:51	11:55	1-	11:43	11:52	12:12	1+
3	?	2													12:00	12:04	12:21	1	11:52	12:06	12:24	1+
3	C7.2	2	12:42	12:45	12:51	1-									12:42	12:46	12:52	1-				
3	M6.1	8	13:14	13:19	14:16	2+					13:16	13:20	14:07	2+	13:15	13:20	13:58	2	13:16	13:21	13:46	1+
4	C5.7	2	10:34	10:37	?	-									10:42	10:43	?	-				
4	?	2	10:51	10:53	11:07	1-									10:49	10:55	11:02	1-				
4	M4.7	8	11:20	11:24	11:51	1+					11:20	11:23	12:00	2	11:19	11:23	11:47	1+	11:22	11:25	11:40	1-
4	?	1													11:53	11:56	12:03	1-				
4	M3.2	7	12:57	13:15	?	-					13:08	13:14	?	-	12:50	13:18	13:41	2+	13:12	13:17	13:26	1-
4	*	6	13:44	13:47	14:08	1					13:44	13:47	14:00	1-	13:44	13:46	13:58	1-	13:46	13:48	13:57	1-
4	C4.2	1													14:46	14:50	14:57	1-				
5	C4.0	4									11:52	11:55	12:06	1-	11:53	11:55	?	-				
5	*	3													12:22	12:30	12:40	1-				
5	C2.1	1													14:02	14:04	14:11	1-				
5	C9.3	6	15:16	15:19	15:42	1+					15:16	15:22	15:31	1-	15:11	15:24	15:41	1+				
5	C4.6	1													16:19	16:22	?	-				
5	*	1													16:26	16:29	16:32	1-				
6	M7.6	6	10:55	11:07	11:55	2+					10:54	11:02	11:32	2	10:58	11:06	11:38	2	11:00	11:07	11:37	2
6	C4.8	1													13:09	13:15	13:26	1-				
6	C5.4	1													14:19	14:29	?	-				
6	C5.5	1													14:47	14:55	15:00	1-				
7	M7.5	6	09:02	09:20	09:48	2+									09:05	09:22	09:54	2+	08:57	09:10	09:23	1+
7	C9.1	7	12:09	12:14	12:34	1									12:02	12:16	12:23	1	12:10	12:16	12:31	1
8	M2.0	5	09:16	09:29	09:51	2									09:16	09:28	09:50	2				
8	C7.8	7	11:02	11:03	11:09	1-					11:01	11:03	11:11	1-	11:01	11:03	11:12	1-				
8	C8.0	7	12:54	12:55	13:04	1-					12:54	12:55	13:04	1-	12:54	12:55	13:04	1-				
8	C3.7	1													15:51	15:54	15:57	1-				
9	C4.1	5	14:07	14:13	14:25	1-					14:07	14:12	14:23	1-	14:07	14:14	14:29	1				
10	C3.6	2	11:07	11:14	11:20	1-									11:07	11:14	11:20	1-				
10	C2.9	2	12:33	12:36	12:45	1-									12:33	12:37	12:50	1-				
11	C7.6	8	13:32	13:48	14:22	2+					13:32	13:50	15:06	3	13:33	13:56	14:27	2+	13:32	13:54	14:29	2+
11	C3.3	1													15:19	15:22	15:31	1-				
12	C3.9	2	12:42	12:46	12:55	1-									12:44	12:47	12:53	1-				
13	?	1													09:56	10:04	?	-				
13	C2.0	5	10:07	10:10	10:15	1-					10:07	10:10	10:16	1-	10:07	10:10	10:16	1-				
13	M1.0	8	11:07	11:11	11:23	1-					11:07	11:10	11:31	1	11:07	11:10	11:29	1	11:09	11:15	11:32	1
13	C3.3	3													12:08	12:10	12:18	1-				
13	C3.2	4	12:36	12:38	12:45	1-									12:36	12:40	12:43	1-				
14	M1.2	7	09:56	10:05	10:20	1					09:57	10:07	10:35	2	09:57	10:08	10:23	1+				
14	C4.8	3	14:15	14:18	14:28	1-					14:16	14:19	14:25	1-	14:15	14:20	14:24	1-				
15	C2.4	1													13:58	14:05	14:16	1-				
16	C6.1	1													18:36	18:41	18:58	1				
17	C3.9	3	11:50	11:54	12:09	1									11:47	11:57	12:13	1+				
17	C3.9	6	13:39	13:43	13:49	1-					13:38	13:43	14:01	1	13:40	13:43	13:51	1-				
17	C5.7	3	14:46	14:56	15:03	1-					14:51	14:55	15:06	1-	14:52	14:57	?	-				
17	M1.0	5	15:09	15:14	15:34	1					15:09	15:15	15:29	1	15:10	15:14	15:31	1				
17	C4.4	2	15:51	15:58	16:02	1-									15:50	15:57	16:06	1-				
19	C3.4	6	10:12	10:16	10:33	1					10:11	10:16	10:28	1-	10:11	10:19	10:43	1+				
19	C4.2	3	10:45	10:48	?	-									10:46	10:49	10:55	1-				
19	?	3													11:45	11:52	12:05	1				
20	C4.9	5	14:59	15:02	15:12	1-					14:59	15:03	15:16	1-	14:59	15:02	15:17	1-				
21	C5.8	4	11:17	11:20	11:28	1-									11:19	11:23	11:27	1-				
21	M3.3	8	12:10	12:16	12:50	2					12:11	12:17	12:40	1+	12:12	12:17	12:44	1+	12:16	12:18	12:31	1-
21	?	1													13:09	13:12	13:21	1-				
21	M1.4	8	14:33	14:36	14:49	1-					14:35	14:37	15:03	1+	14:33	14:37	15:01	1+	14:34	14:39	14:52	1-
21	C7.6	2									15:58	16:09	16:23	1	15:59	16:08	16:20	1				
22	C3.2	1													16:43	16:45	16:51	1-				
23	C7.5	6	09:13	09:15	09:26	1-					09:13	09:16	09:27	1-	09:13	09:16	09:27	1-				
23	M1.0	9	09:55	09:58	10:22	1+					09:55	09:59	10:25	1+	09:56	09:57	10:10	1-	09:58	10:00	10:16	1-
23	M1.6	8	11:51	11:55	13:17	3					11:50	12:00	?	-	11:51	12:01	?	-	11:56	12:01	12:16	1
23	?	2									12:23	12:28	?	-	12:23	12:27	12:40	1-				
23	?	3									12:47	12:49	13:30	2	12:48	12:52	12:59	1-				
23	?	1													13:02	13:06	13:10	1-				
23	?	6	13:57	14:03	14:07	1-					14:00	14:04	14:28	1+	13:58	14:05	14:21	1	13:59	14:07	14:19	1
23	C5.3	4	</																			

	Xray class		Steve Parkinson (Various)				Andrew Thomas (19.6kHz/22.1kHz)				Phil Rourke (23.4kHz)				Mark Prescott (19.6/22.1/21.75kHz)				John Elliott (19.6kHz)			
			Tuned radio frequency receiver, frame aerals.				Tuned radio frequency receiver, 0.6m frame aerial.				Spectrum Lab, 0.6m frame aerial.				SpectrumLab/Starbase, mini-whip aerial.		Active	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	C6.0																					
1	C2.4																					
1	C4.0																					
1	M2.4		13:16	13:20	13:45	1+	13:15	13:20	13:51	2	13:14	13:18	13:37	1	13:20	13:24	13:39	1	13:12	13:19	14:00	2+
2	M3.0		10:08	10:14	10:50	2	10:10	10:16	10:45	2	10:07	10:12	10:55	2+	10:14	10:18	10:34	1	10:08	10:15	10:45	2
2	C6.5		11:57	12:01	12:10	1-					11:56	12:01	12:15	1								
2	?																					
2	M1.4		12:46	12:52	13:16	1+	12:45	12:52	13:16	1+	12:43	12:52	13:15	1+	12:50	12:56	13:11	1				
2	C6.2																					
2	M5.1		14:03	14:06	14:30	1+	14:03	14:06	14:32	1+	14:01	14:09	14:30	1+	14:07	14:10	14:22	1-	14:03	14:07	14:30	1+
2	C5.6																					
2	M1.2																					
2	M2.7		15:23	15:33	15:49	1+					15:13	15:32	15:27	1-	15:27	15:35	15:46	1				
3	M1.4		09:11	09:13	09:19	1-																
3	C7.1																					
3	?																					
3	C9.5		11:45	11:48	12:02	1-																
3	?																					
3	C7.2																					
3	M6.1		13:14	13:19	13:40	1+	13:12	13:21	14:20	2+					13:18	13:24	13:53	2	13:14	13:19	14:30	2+
4	C5.7																					
4	?																					
4	M4.7		11:20	11:23	11:50	1+					11:19	11:37	12:16	2+	11:24	11:27	12:10	2+	11:20	11:23	12:15	2+
4	?																					
4	M3.2						11:19	13:18	14:02	3+					13:02	13:17	13:42	2	13:10	13:13	14:30	2+
4	*		13:44	13:46	13:54	1-					13:43	13:45	13:56	1-								
4	C4.2																					
5	C4.0		11:52	11:55	12:04	1-					11:50	11:54	12:06	1-								
5	*		12:25	12:28	12:34	1-					12:21	12:29	12:43	1								
5	C2.1																					
5	C9.3		15:17	15:21	15:30	1-					14:39	15:21	15:46	2+	15:19	15:25	15:37	1-				
5	C4.6																					
5	*																					
6	M7.6		10:55	11:06	12:15	2+	10:55	11:06	11:30	2												
6	C4.8																					
6	C5.4																					
6	C5.5																					
7	M7.5		09:06	09:20	09:50	2	09:03	09:20	09:50	2+	09:02	09:12	10:09	2+								
7	C9.1		12:09	12:14	12:27	1-	12:09	12:14	12:33	1	12:06	12:14	12:45	2	12:14	12:17	12:25	1-				
8	M2.0		09:21	09:29	09:45	1	09:18	09:30	09:44	1+	09:04	09:28	09:54	2+								
8	C7.8		11:01	11:03	11:09	1-	11:02	11:03	11:10	1-	10:59	11:02	11:14	1-	11:05	11:07	11:12	1-				
8	C8.0		12:54	12:55	13:03	1-	12:54	12:55	13:09	1-	12:51	12:54	13:02	1-	12:57	13:00	13:04					
8	C3.7																					
9	C4.1		14:07	14:13	14:27	1					14:05	14:14	14:30	1								
10	C3.6																					
10	C2.9																					
11	C7.6		13:33	13:51	14:30	2+	13:33	13:49	14:20	2+	13:28	13:48	15:04	3	13:44	13:53	14:14	1+				
11	C3.3																					
12	C3.9																					
13	?																					
13	C2.0		10:07	10:09	10:20	1-					10:06	10:09	10:20	1-								
13	M1.0		11:07	11:10	11:30	1	11:06	11:10	11:27	1	11:05	11:10	11:33	1+	11:11	11:14	11:24	1-				
13	C3.3		12:08	12:11	12:20	1-					12:07	12:09	12:30	1								
13	C3.2		12:36	12:38	12:47	1-					12:35	12:38	12:48	1-								
14	M1.2		09:57	10:07	10:20	1	09:58	10:07	10:28	1+	09:53	10:04	10:27	2	10:00	10:09	10:22	1				
14	C4.8																					
15	C2.4																					
16	C6.1																					
17	C3.9		11:46	11:54	12:08	1																
17	C3.9		13:39	13:42	13:50	1-	13:39	13:42	13:53	1-									13:38	13:43	13:55	1-
17	C5.7																					
17	M1.0		15:10	15:14	15:28	1-									15:13	15:18	15:32	1				
17	C4.4																					
19	C3.4		10:12	10:17	10:30	1-	10:10	10:16	10:30	1	10:08	10:18	11:04	2+								
19	C4.2		10:44	10:52	11:10	1+																
19	?		11:47	11:51	12:00	1-					11:29	11:52	12:25	2+								
20	C4.9										14:57	15:01	15:12	1-	15:04	15:06	15:14	1-				
21	C5.8		11:17	11:20	11:28	1-					11:16	11:20	11:30	1-								
21	M3.3		12:11	12:17	12:50	2	12:10	12:16	12:57	2+	12:11	12:27	13:42	3	12:16	12:20	12:45	1+				
21	?																					
21	M1.4		14:33	14:36	14:55	1	14:33	14:36	14:47	1-	14:31	14:36	15:03	1+								