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BAA Radio Astronomy Section.

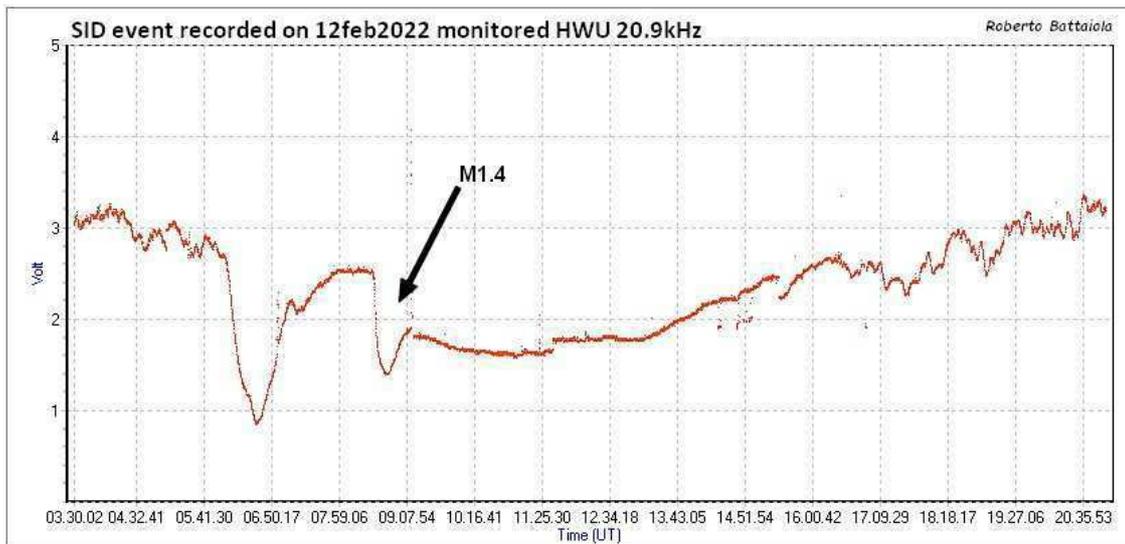
Director Paul Hearn.

RADIO SKY NEWS

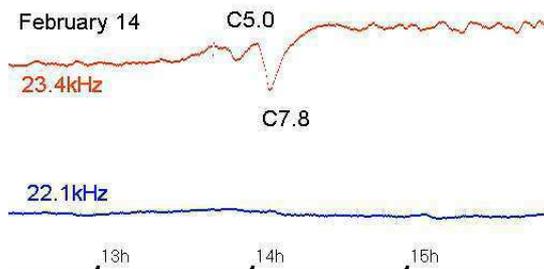
2022 FEBRUARY.

VLF SID OBSERVATIONS.

Solar flare activity has increased this month, with 16 SIDs recorded. The satellite data shows activity throughout February, mostly with B- and C-class flares. There were three M-class flares shown, two of which we managed to record. The M1.4 flare peaking at 08:43UT on the 12th was the strongest event of the month, and produced a clear SID on Roberto Battaiola's recording:

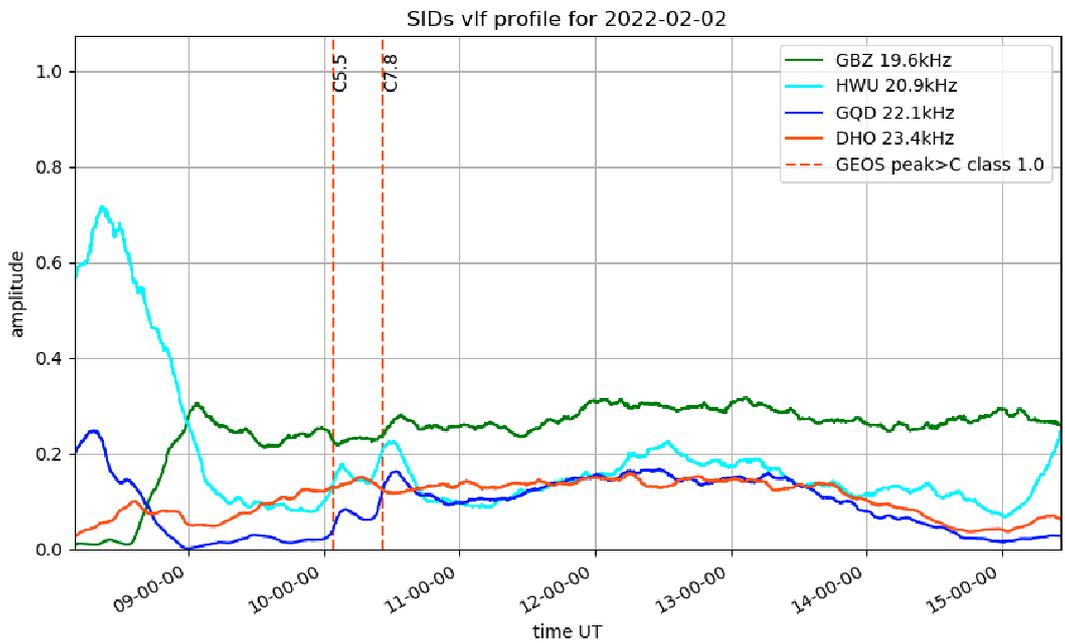


The most widely recorded event was also the most tricky to decode. My own recording shows the two SIDs well at 23.4kHz, recorded on the 14th:

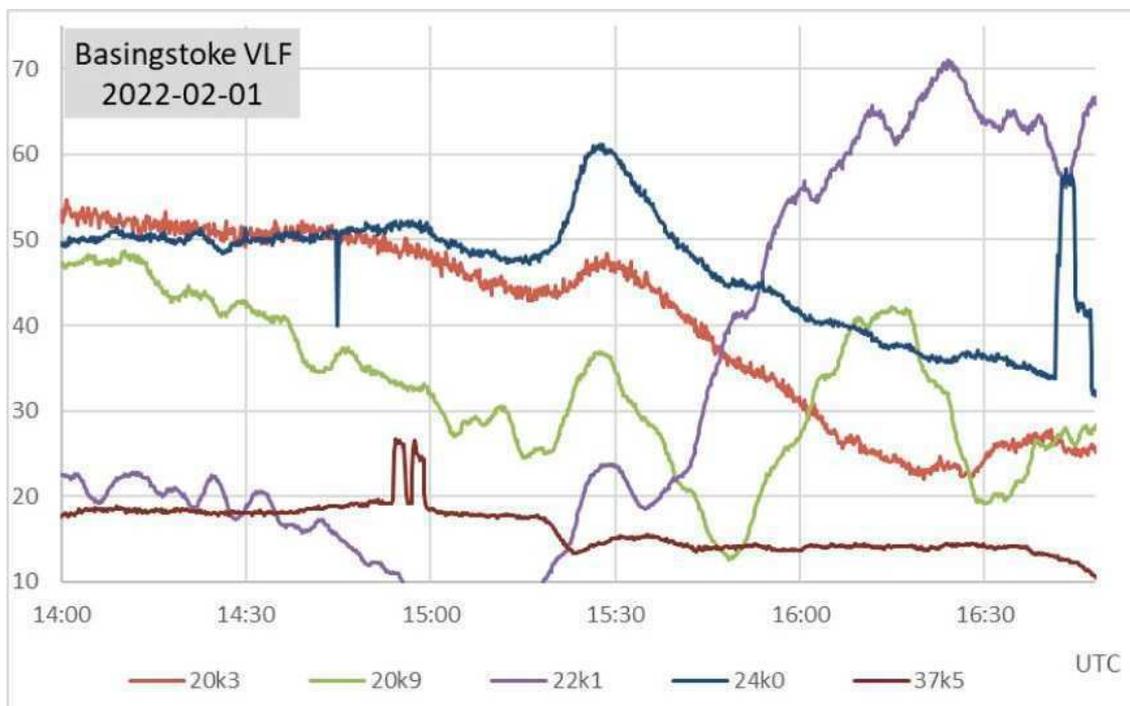


There are clearly two SIDs recorded, the second being the stronger of the pair. The SWPC bulletin lists a C5.0 flare peaking at 13:53UT, followed by an event peaking at 14:33 without a flare magnitude. By far the

majority of observers recorded a peak at around 14:07, matching the second SID in my chart, above. Looking at the German GOES website www.polarlicht-vorhersage.de/goes-archive there was a double peaked flare, the second peak reaching C7.8 and matching the timing of our observations. Another double peaked flare is shown in this recording from February 2nd by Mark Prescott:

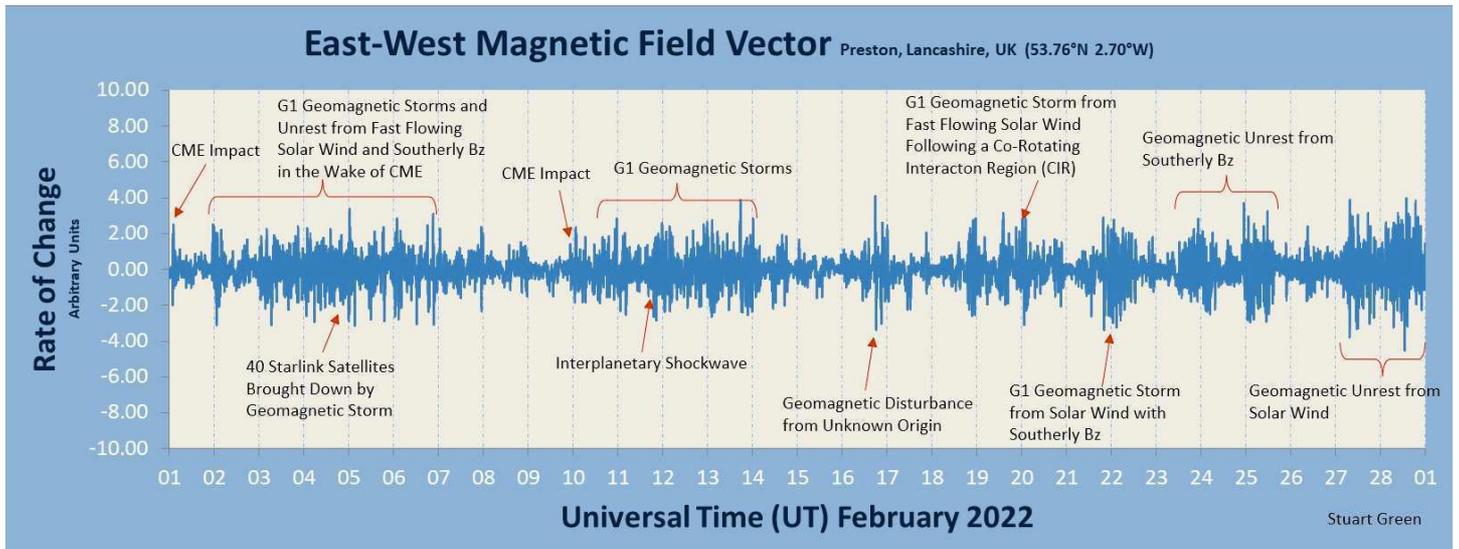


Individual SIDs show well at 22.1kHz and 20.9kHz, the second being the stronger. As with the previous pair, the second event is not listed in the SWPC bulletin.



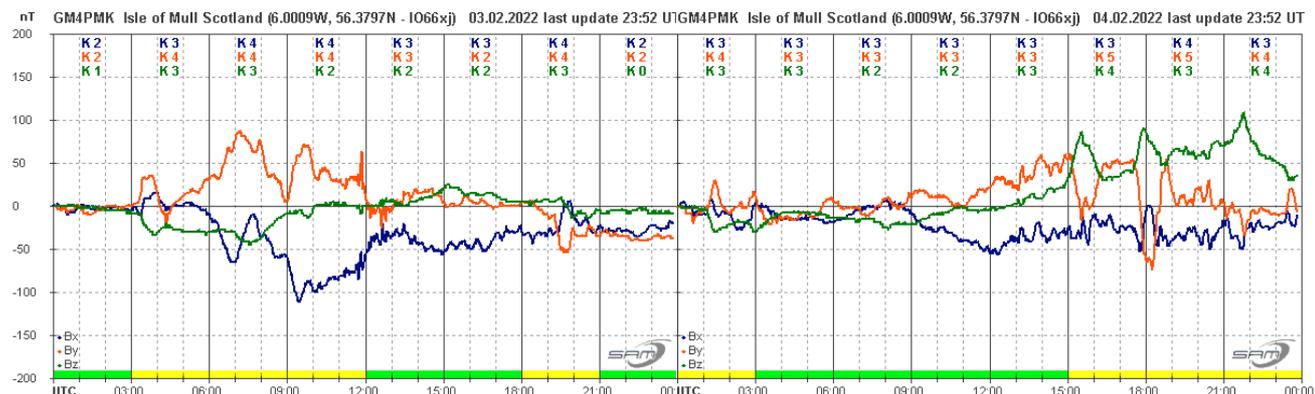
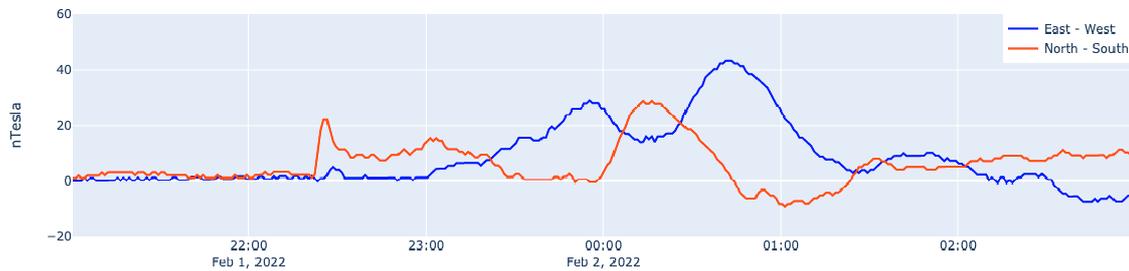
Noise on the VLF signals remains a problem in February, but this recording by Paul Hyde shows a clear SID from the C6.5 flare peaking at 15:26 on the 1st. 24kHz has a very clean signal, and matches well with the response at 20.9kHz. The more local signals are generally less stable, but the SID is clear. The Icelandic signal at 37.5kHz shows a very weak response to the flare.

MAGNETIC OBSERVATIONS.



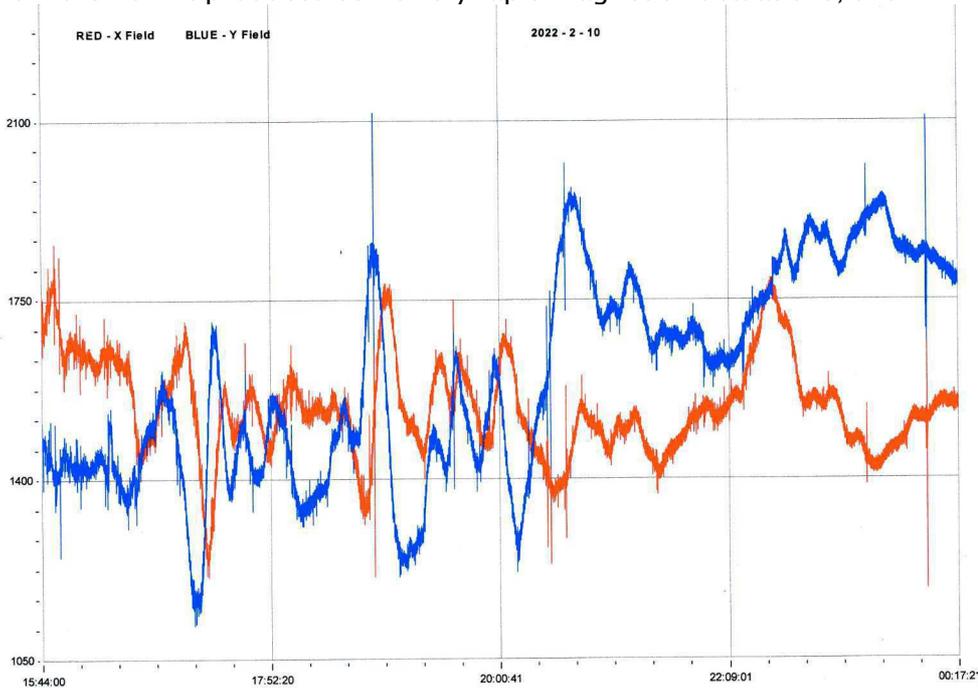
The month's summary of magnetic activity by Stuart Green shows disturbed conditions throughout the month. A CME recorded in satellite data from January 29th reached Earth late on February 1st, creating a distinct transient in our magnetometer recordings. This chart by Nick Quinn shows the impact clearly at about 22:20UT:

Steying Magnetometer (50.8 North, 0.3 West)

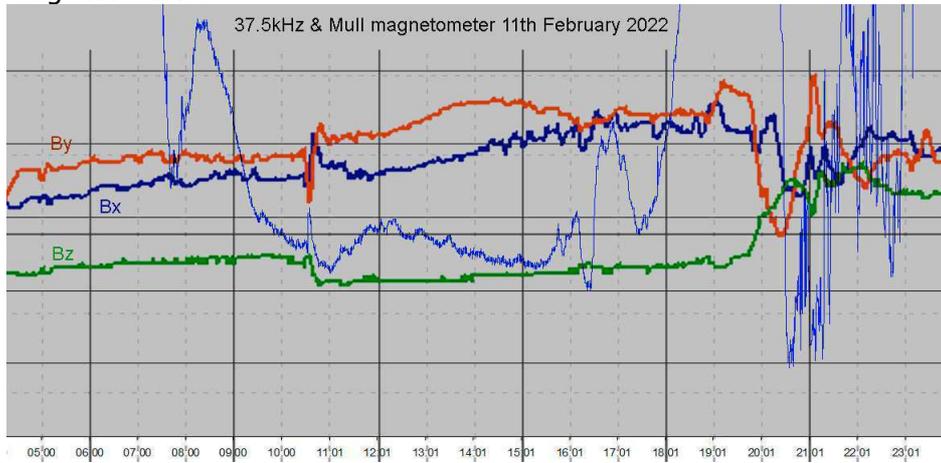


The chart by Roger Blackwell shows the strong disturbance following the impact over the 3rd and 4th. Although the CME impact was on the 1st, there was only a very mild disturbance on the 2nd. It faded out in the early hours of the 5th. This CME will no doubt be remembered for its timing during a starlink satellite launch. The initial orbit of the satellites was at a fairly low altitude, in the region severely disturbed by the magnetic disturbance. Most of the satellites were subsequently lost due to the increased atmospheric drag and loss of control.

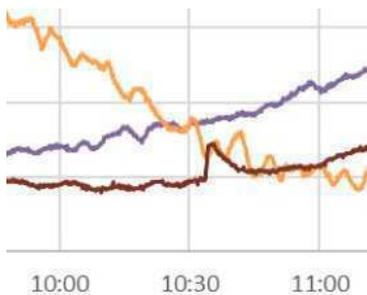
A C3.1 flare at 12:41UT on the 6th was not recorded as a SID, but created a CME that was well recorded from the 10th. It produced some very rapid magnetic fluctuations, shown in this recording by Colin Clements:

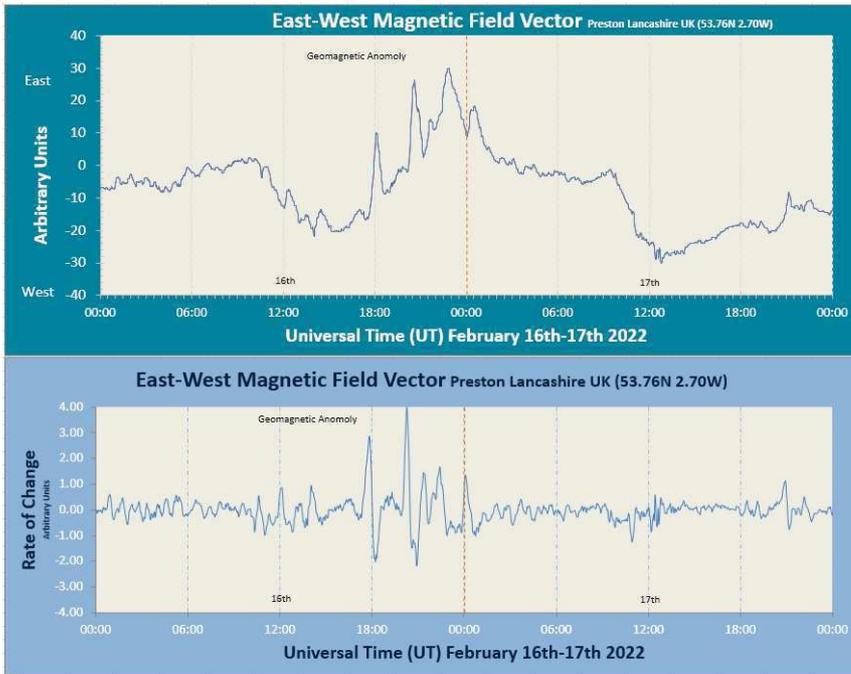


The disturbance continued on the 11th, producing some transients on the 37.5kHz signal from Grindavik, Iceland. This chart shows Mark Edwards' VLF recording (light blue) superimposed on Roger Blackwell's magnetometer:

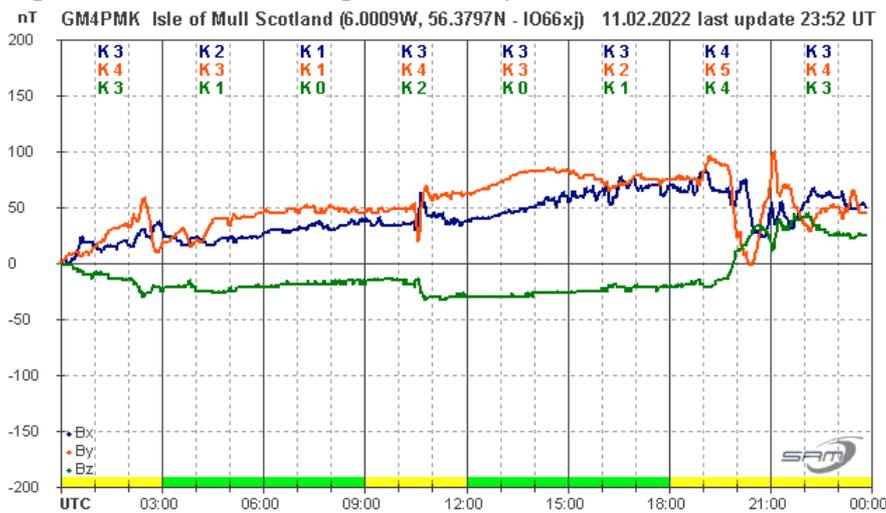


There is a good match at about 10:40 with the very rapid magnetic pulse, and again after 15:00 with a more wave-like disturbance. Paul Hyde also recorded the morning transient at 37.5kHz. 24kHz is in purple, 23.4kHz in orange, showing no sign of the magnetic pulse.



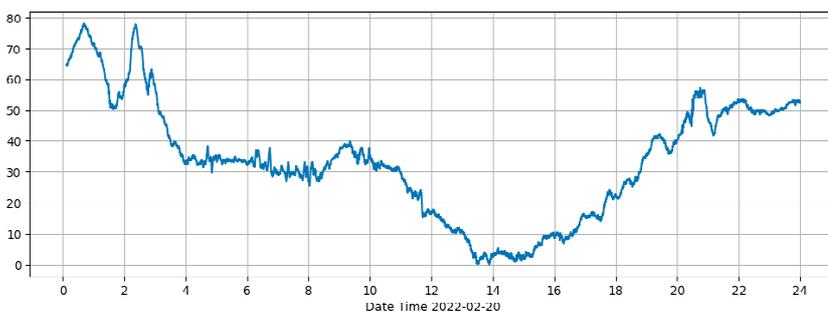


Stuart Green noticed these unusual pulses between 18UT and midnight on the 16th. The only activity at the time seems to have been a CME ejected away from Earth. He has found some similarity with an Intermagnet chart on the web, but no source is given. It does not seem to be listed in the STCE bulletin either. Roger Blackwell's recording shows a rapid disturbance around this time, along with a transient at about 10:45:



Coronal hole winds were responsible for disturbances later in February, mostly fairly gentle compared to the CME effects. This recording from the 20th by Callum Potter shows a gentle disturbance through the day:

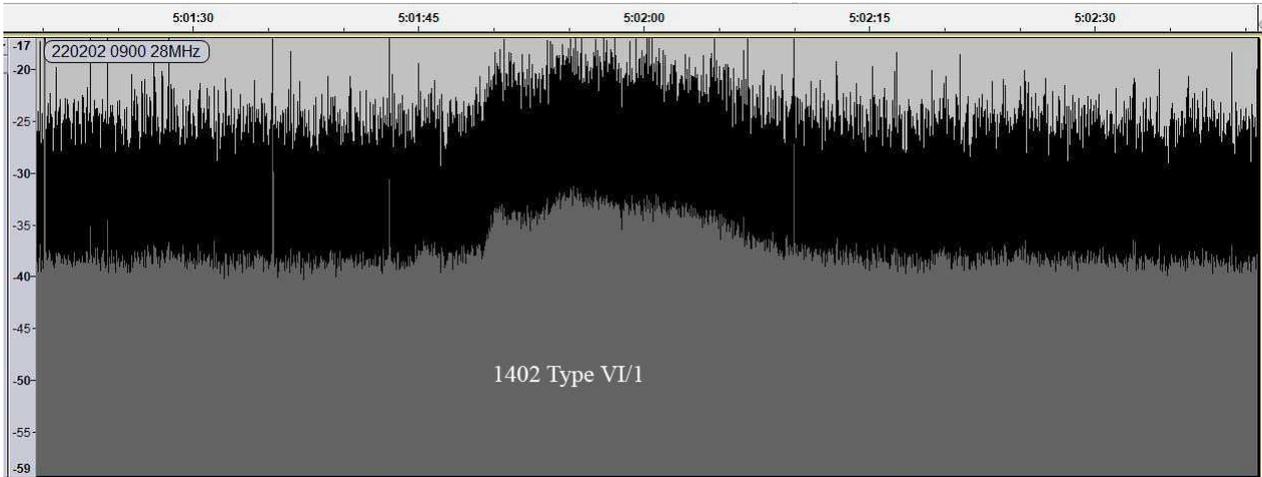
Bredons Hardwick Magnetometer (52.02N,2.13W)



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

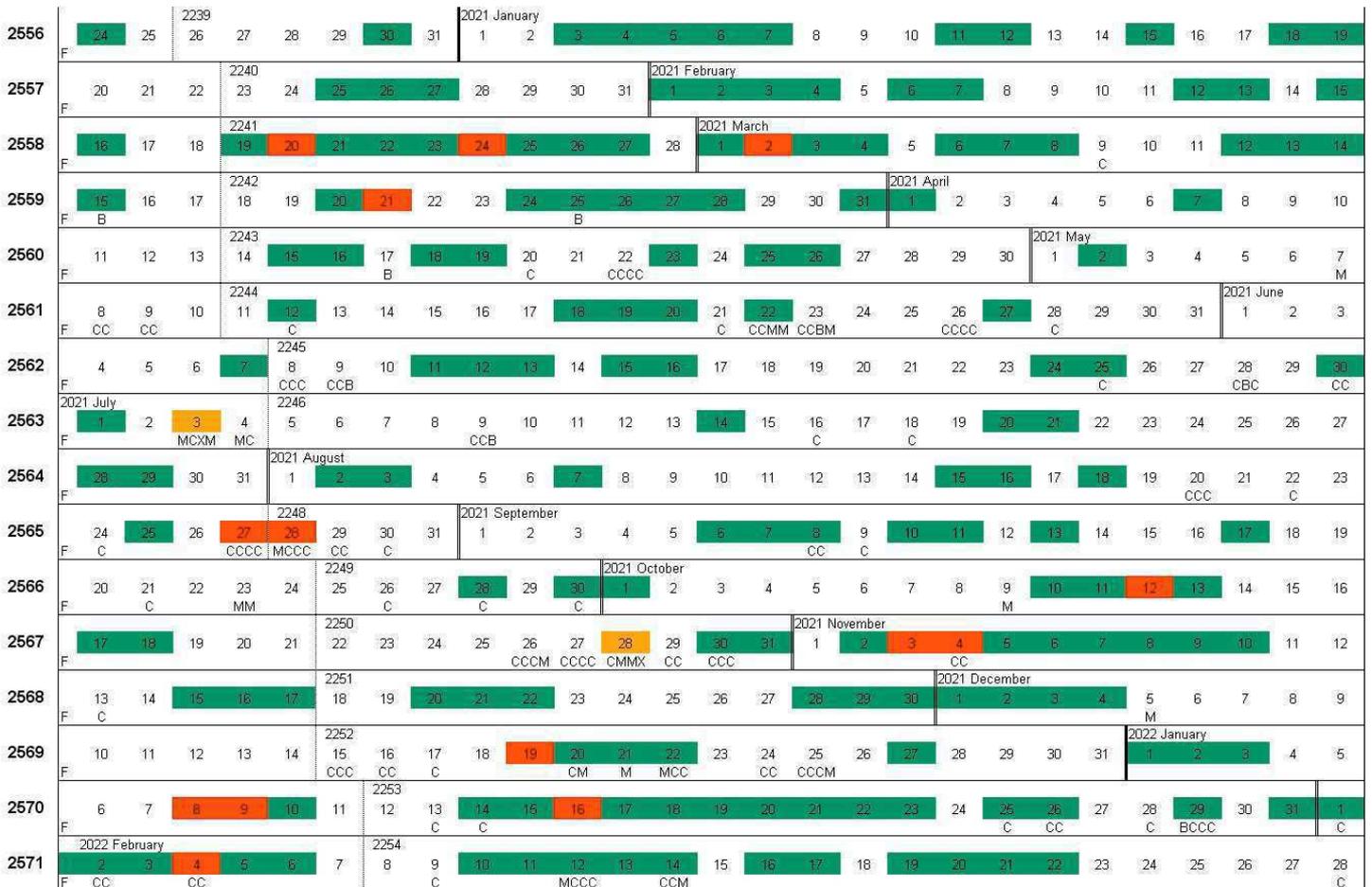
SOLAR EMISSIONS.

Colin Briden recorded a very mild Solar Radio emission at 28MHz, rising about 5dB above the noise at 14:02 on the 2nd:



It lasted for just 30 seconds, and does not seem to be linked to any of the listed flares.

BARTELS CHART



DAY	Xray class	Observers	John Cook (23.4kHz/22.1kHz)	Roberto Battaola 20.9kHz	Paul Hyde (22.1kHz/24kHz)	Mark Edwards (24.0kHz/37.5kHz)	Colin Clements (23.4kHz/18.3kHz)
			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.
			START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	C6.5	2	15:21 15:25 15:40 1		15:19 15:26 15:48 1+		
2	C5.5	6	10:00 10:04 10:15 1-	09:55 10:04 10:14 1	10:00 10:04 10:14 1-		
2	C7.8	5	10:18 10:25 10:43 1		10:19 10:25 10:49 1+		
4	C2.1	2			15:46 15:52 15:56 1-	15:45 15:52 ? -	
4	C2.0	1				16:00 16:11 16:50 2+	
7	C1.3	3			11:06 11:10 11:18 1-	11:07 11:10 11:14 1-	
7	C3.8	9	12:37 12:40 12:57 1	12:32 12:41 12:50 1-	12:36 12:40 13:08 1+	12:36 12:42 13:09 2	
9	C5.7	2				17:33 17:38 17:49 1-	
12	M1.4	3	08:34 08:45 ? -	08:26 08:43 09:08 2			
12	?	1				16:52 16:59 ? -	
12	C9.2	1				17:06 17:09 17:17 1-	
12	C8.0	1				17:22 17:25 17:29 1-	
14	C5.0	3	13:51 13:54 ? -			13:52 13:55 14:01 1-	
14	?	9	14:03 14:07 14:25 1	14:03 14:07 14:12 1-		14:03 14:08 14:20 1-	
14	M1.0	1				17:18 17:30 17:45 1+	
28	C3.1	2				09:16 09:20 09:26 1-	

DAY	Xray class	Observers	Steve Parkinson (Various)	Andrew Thomas (22.1kHz)	Phil Rourke (23.4kHz)	John Wardle	Christopher Bailey
			Tuned radio frequency receiver, frame aeral.	Tuned radio frequency receiver, 0.6m frame aerial.	Spectrum Lab, 0.6m frame aerial.	SpetrumLab/Starbase, Active mini-whip aerial.	Spectrum Lab
			START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	C6.5						
2	C5.5			09:56 10:15 10:36 2			
2	C7.8						10:18 10:26 10:41 1
4	C2.1						
4	C2.0						
7	C1.3						
7	C3.8		12:37 12:41 12:58 1	12:37 12:40 12:58 1			12:32 12:41 12:55 1
9	C5.7						17:30 17:36 17:55 1
12	M1.4						08:33 08:43 08:58 1
12	?						
12	C9.2						
12	C8.0						
14	C5.0						
14	?		14:03 14:08 14:18 1-	14:02 14:06 14:15 1-	14:03 14:08 14:18 1-		13:56 14:07 14:16 1
14	M1.0						
28	C3.1						09:07 09:10 09:40 2

DAY	Xray class	Observers	Colin Briden (22.1kHz)	Andrew Lutley (23.4kHz)	Peter Meadows (23.4kHz)	John Elliott (18.3kHz)	Mark Prescott (20.9kHz)
			Spectrum Lab / PC, 1.2m frame aerial.	Tuned radio frequency receiver, 0.6m frame aerial.	Tuned radio frequency receiver, 0.6m frame aerial.	Tuned radio frequency receiver, 0.5m frame aerial.	
			START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)	START PEAK END (UT)
1	C6.5						
2	C5.5		10:00 10:04 ? -				09:58 10:08 10:15 1-
2	C7.8		10:18 10:27 10:37 1				10:20 10:30 10:45 1
4	C2.1						
4	C2.0						
7	C1.3		11:03 11:08 11:15 1-				
7	C3.8		12:37 12:41 12:47 1-				12:38 12:45 12:58 1
9	C5.7						
12	M1.4						
12	?						
12	C9.2						
12	C8.0						
14	C5.0		13:52 13:54 13:56 1-				
14	?		14:04 14:08 14:12 1-				14:07 14:11 14:20 1-
14	M1.0						
28	C3.1						

VLF flare activity 2005/22

