The British Astronomical Association

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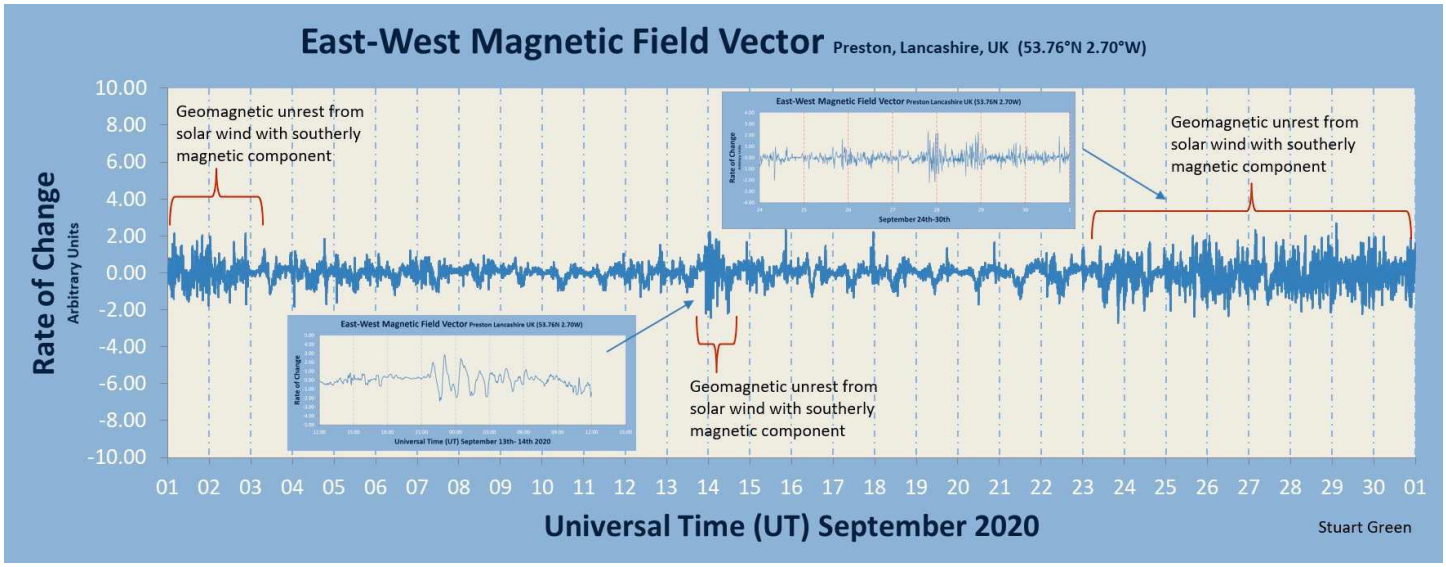
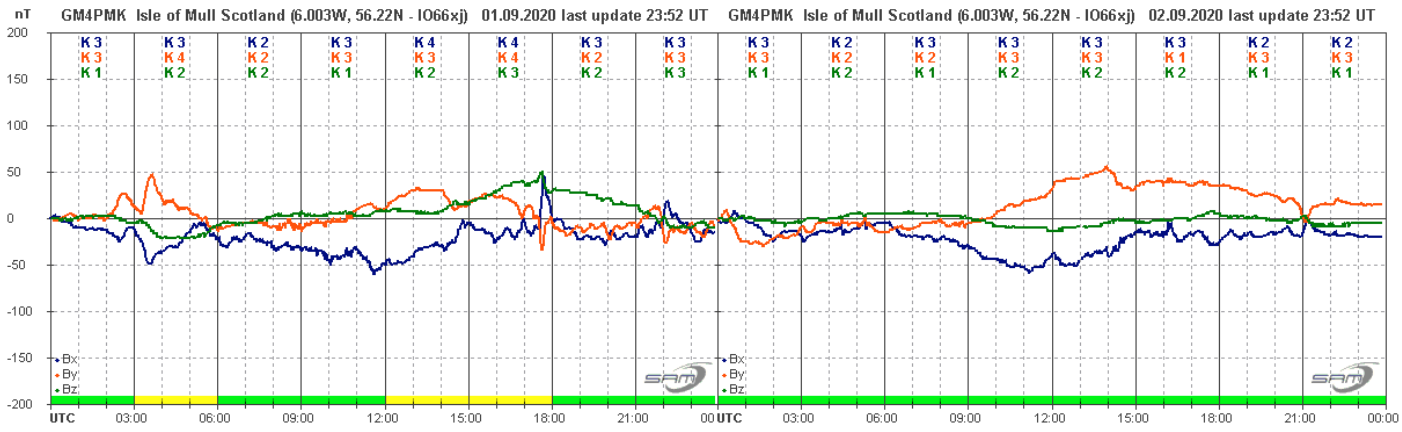
BAA Radio Astronomy Section. 2020 SEPTEMBER.

September started quietly with just a couple of A-class flares shown in the GOES data. Activity began to increase on the 21st as AR12773 became active with numerous small B-class flares. The largest of the month was at 00:38UT on the 25th, when A C1.0 flare was recorded. Occurring in the middle of the night for European observers, there were no SIDs reported.

MAGNETIC OBSERVATIONS.

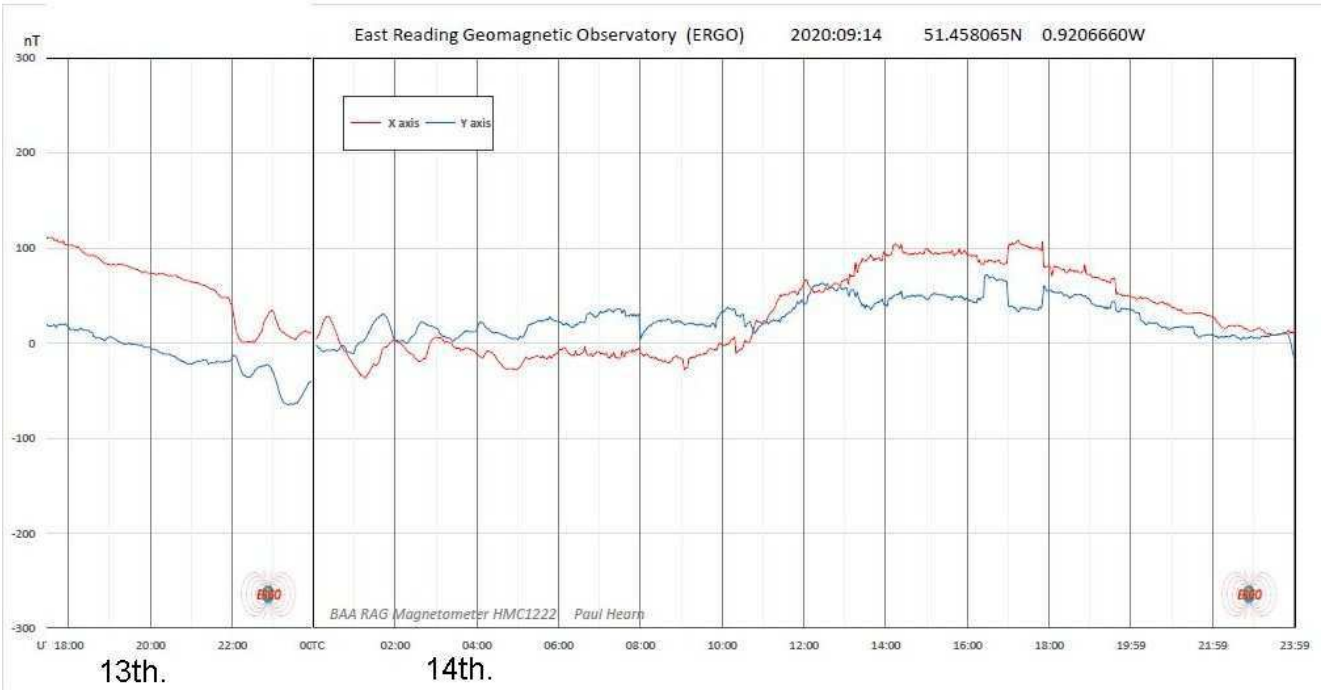


Stuart Green's chart shows magnetic activity in September. All three periods of activity were from coronal hole winds, the first continuing from the activity seen at the end of August.



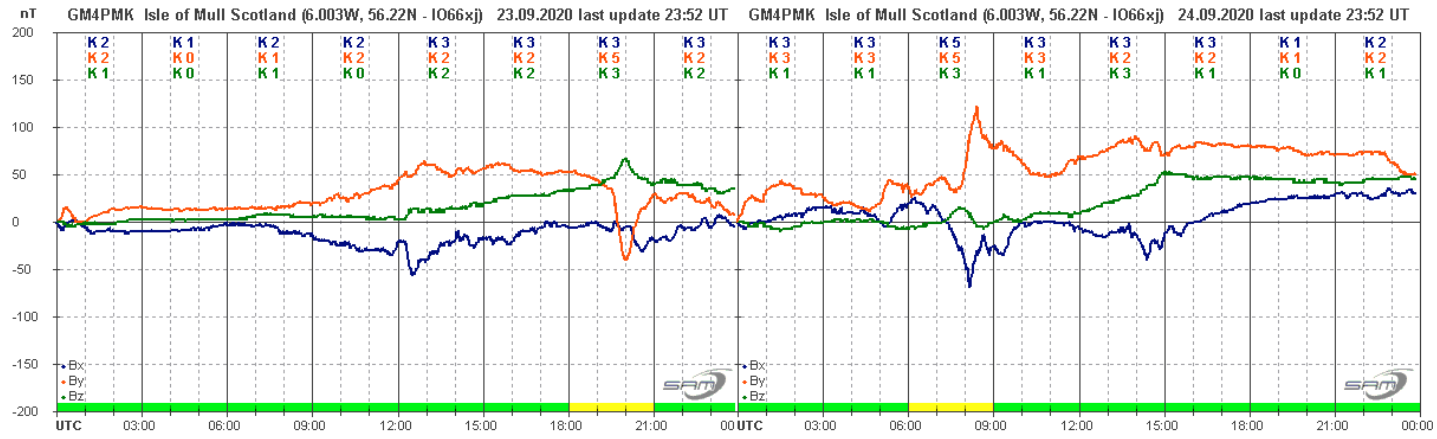
Roger Blackwell's chart shows the disturbance fading on the 2nd following mild activity on the 1st.

The previous day's recordings can be seen in the August summary, and showed the peak disturbance at about 100nT.

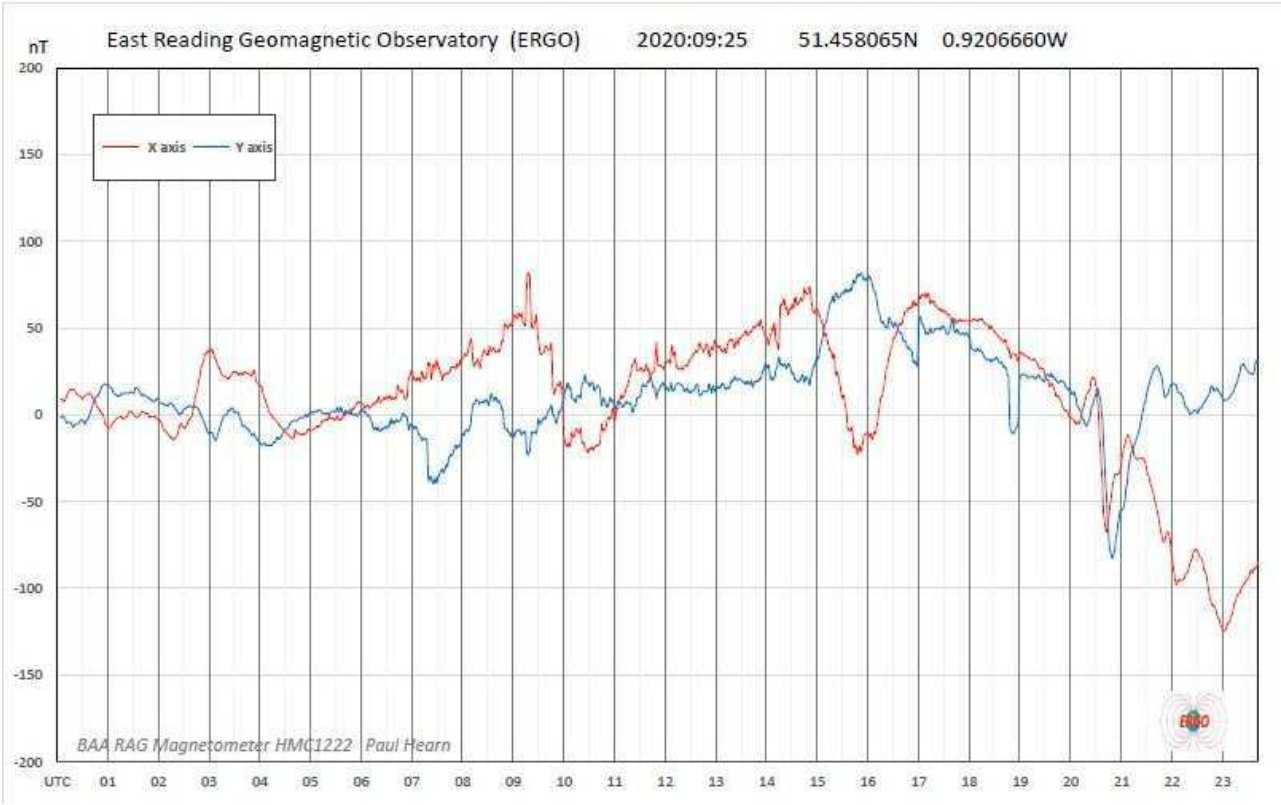


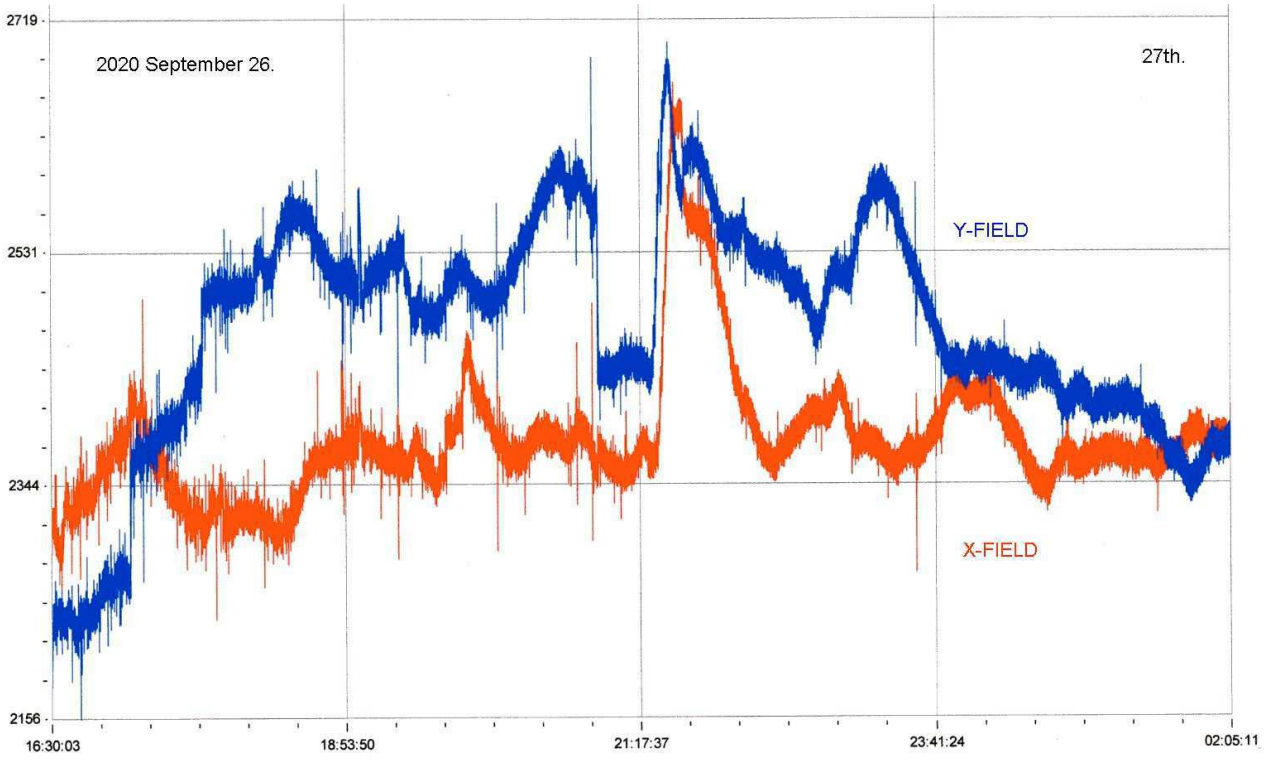
This recording by Paul Hearn shows a disturbance starting at 22:00UT on the 13th, continuing though in to the morning of the 14th. The pulses between 16:00 and 18:00 are from local interference. A large north-polar coronal hole was present, along with a very patchy area covering most of the visible hemisphere. This was a very mild disturbance, similar to that seen at the previous rotation (August 18th and 19th).

A coronal hole covering the northern polar region of the sun will be partly visible from Earth throughout the solar rotation, but southerly extensions will still make periodic appearances. Such an area was seen at the end of August, and reappeared in September. Satellite data shows the solar wind speed increasing from September 20th, with magnetic activity beginning on the 23rd shown in the recording by Roger Blackwell:

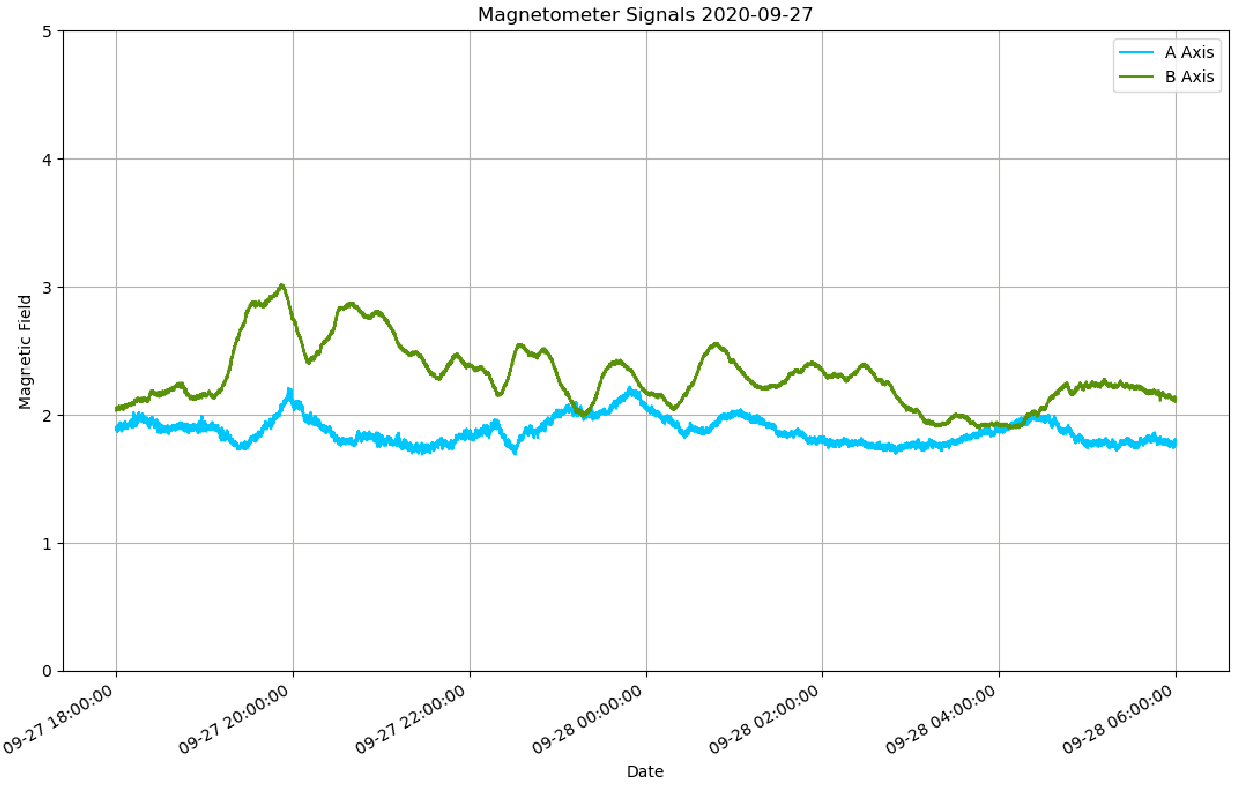


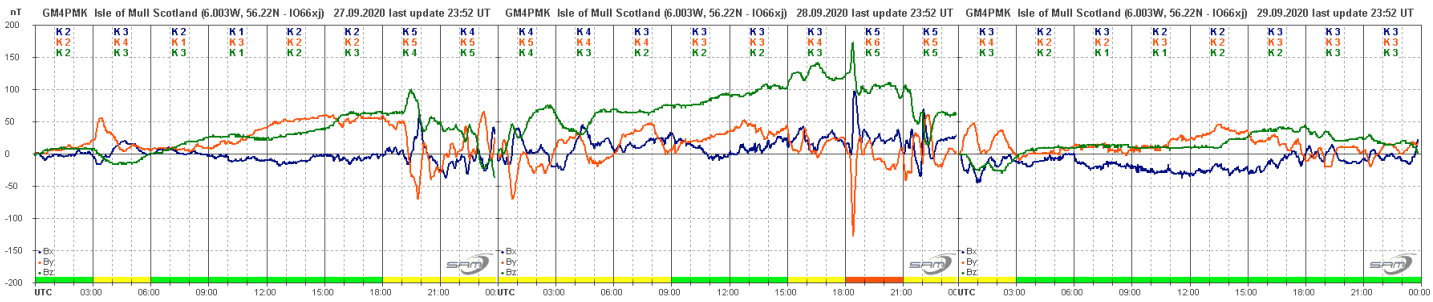
This activity continued into the 25th, with a strong disturbance in the evening, shown in the following chart by Paul Hearn:





This chart shows activity on the 26th and 27th recorded by Colin Clements. The 27th to 29th marked the height of this magnetic storm, with aurora reported from northern areas and radio disruption warnings issued to aircraft pilots. Andrew Thomas has been experimenting with the UKRAA magnetometer, and started a trial run just in time to catch this activity peak. His magnetometer was mounted in a garden cold frame, with a plastic rain shield for protection. This is his recording from the 27th and 28th:



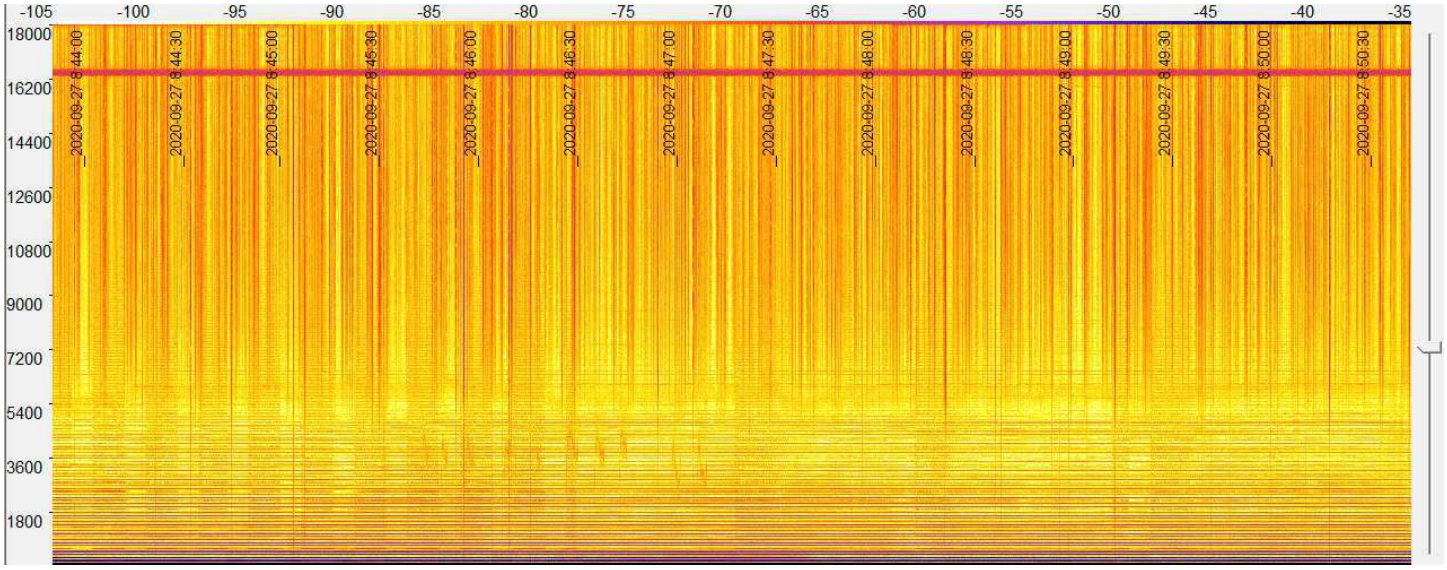


Roger Blackwell's recording from the 27th to 29th shows the peak activity in the evening of the 27th and 28th, with some very turbulent periods. Mild activity continued into the evening of the 30th. The period around the equinoxes provide ideal conditions for solar wind particles to enter the Earth's night-side polar regions, and create strong magnetic disturbances. With observers from Scotland, Northern Ireland and southern England there will be significant differences in the activity that we record, but they all show the strongest activity for some time.

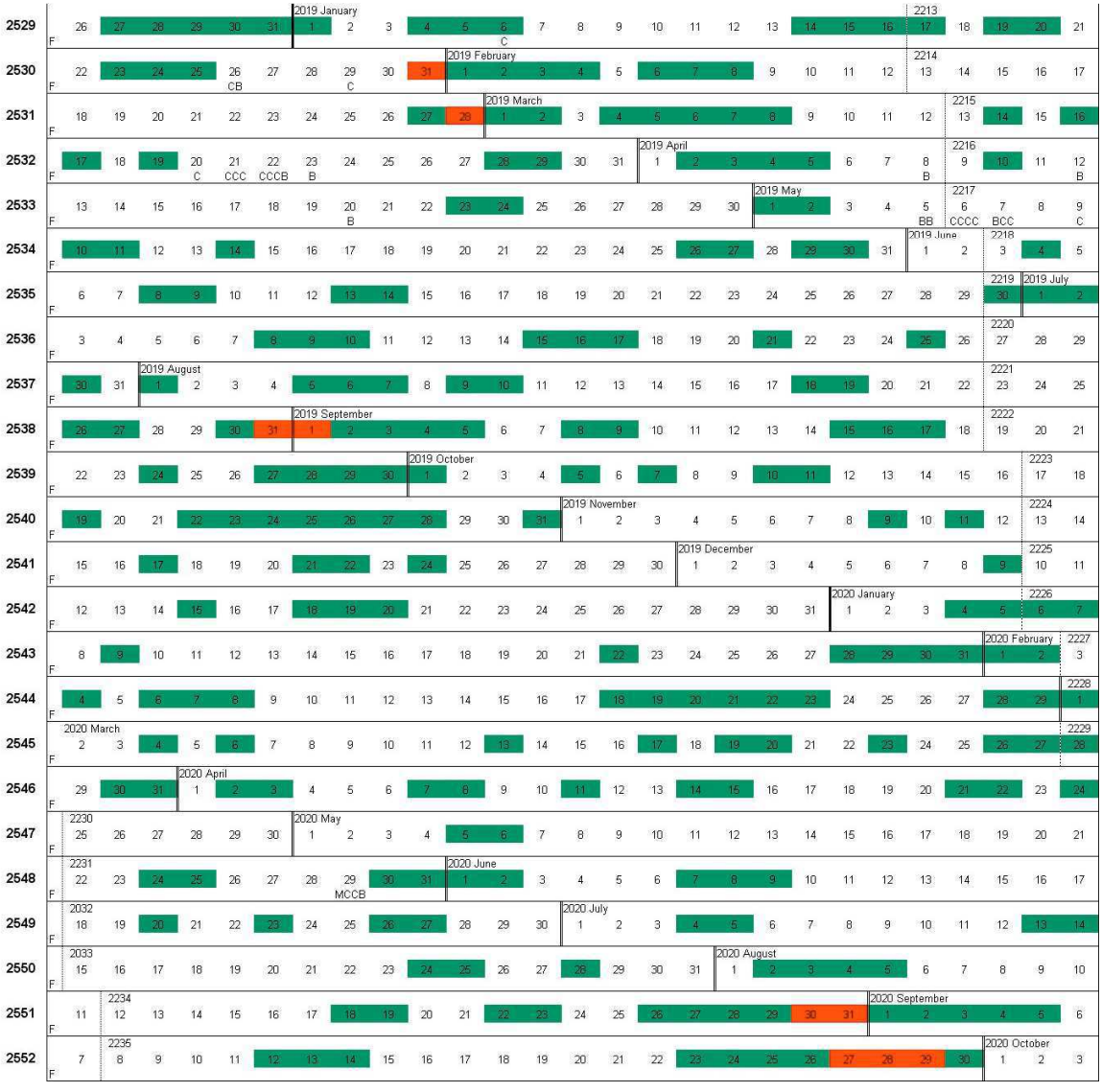
Magnetic observations received from Roger Blackwell, Colin Clements, Stuart Green, Paul Hearn, Andrew Thomas, and John Cook.

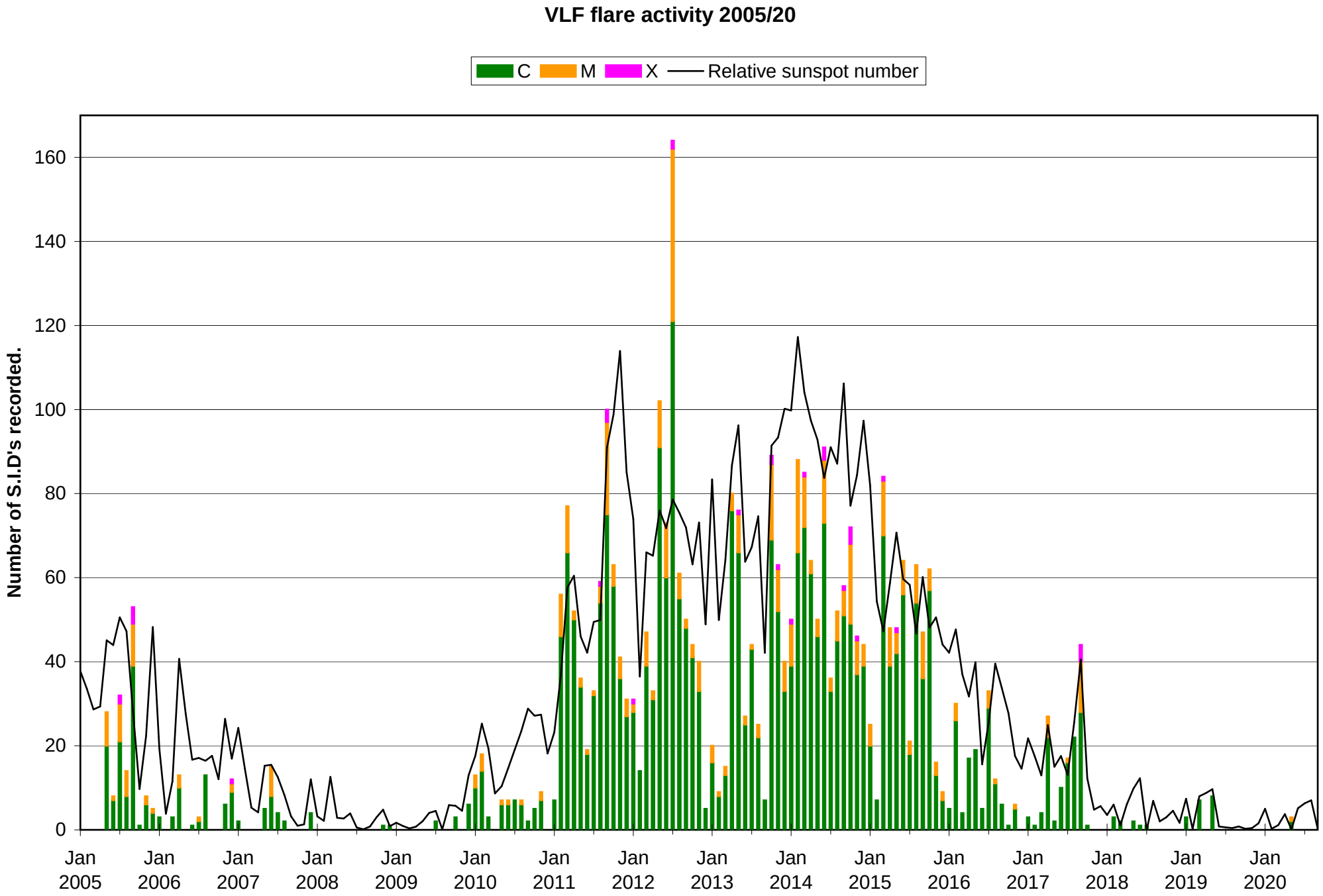
ATMOSPHERICS.

Colin Briden recorded a brief period of atmospherics on September 27th around 08:45 to 08:48UT. They do not seem to be related to the magnetic storm, as conditions were very quiet at that time. His recording is shown on the next page. The signals are quite faint on the chart, so I hope that they can be seen. The vertical scale is Hz, with the signals at about 4kHz.



BARTELS CHART




VLF flare activity 2005/20
C
M
X
Relative sunspot number
Number of S.I.D's recorded.
0
20
40
60
80
100
120
140
160
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