<table>
<thead>
<tr>
<th>Xray class</th>
<th>Observers</th>
<th>John Cook (23.4kHz/22.1kHz)</th>
<th>Roberto Battaola (20.9kHz)</th>
<th>Paul Hyde (Various)</th>
<th>Mark Edwards (20.9/24.0/18.3kHz)</th>
<th>Colin Clements (23.4kHz/22.1kHz)</th>
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<td>Modified AAVSO receiver.</td>
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<td>Spectrum Lab / PC 2m loop aerial.</td>
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<td>Phil Rourke (23.4kHz)</td>
<td>Jim Barber</td>
<td>John Elliott (18.3kHz)</td>
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VLF flare activity 2005/17.

Number of S.I.D.'s recorded.

Relative sunspot number
Activity in July was much higher than in June, with a notable increase in the number of B-class flares recorded. While most of these were only just below the C-class, there was also a B4.4 flare recorded. There was also a strong M1.3 flare well timed in the afternoon of the 3rd, although we missed the strongest flare of the month, M2.4, at 02:09UT on the 14th. Background X-ray flux started the month at A3, rising to B2 by the 7th. It continued at this level until the 21st, falling back to about A5 by the end of the month. Once again there has been plenty of noisy recordings, Colin Clements noting the 18th, 19th, 20th, 26th and 30th as suffering substantial noise, with oscillations also present on the 4th, 5th, and 6th at 22.1kHz.

This shows the M1.3 flare on the 3rd as recorded by Mark Edwards. All five signals have produced well defined ‘shark-fin’ SIDs. Note also the higher noise levels on the 22.1kHz signal (yellow) and 19.6kHz signal (brown).

This is my own recording from the 9th, including the very weak B4.4 flare. It has not produced a SID for me, although it was recorded by Paul Hyde. The C5.3 flare shows a clear SID at 23.4kHz, although it is less well recorded at 22.1kHz. Conversely, the earlier C4.0 flare is well recorded at both frequencies. The C1.2 flare at 07:34 also shows well at 22.1kHz.
These two recordings by Colin Clements show activity on the 16th. Despite the relatively weak flares, the SIDs show well at both frequencies in the top chart. The lower chart is an associated noise burst at 20.3MHz that has sent Colin’s recorder off-scale. Note that the time scale is not the same on each recording.
The month started with a minor magnetic disturbance on July 2\textsuperscript{nd}, with an associated 37.5kHz effect recorded by Mark Edwards:

Mark has superimposed the magnetogram by Roger Blackwell onto his VLF recording, showing the link. The first VLF disturbance is from about 06:20UT to 07:30, with a more significant disturbance from 10:15 to 11:30. The lower light-blue trace is 37.5kHz, while the upper three traces are the magnetometer. The source of the magnetic disturbance may be a CME associated with a minor B1.3 flare on June 28\textsuperscript{th}. Satellite images show a partial halo CME. There were also solar wind transients from a coronal hole at the same time.

A much stronger magnetic storm was recorded on July 16\textsuperscript{th}, again with 37.5kHz links:

This recording by Paul Hyde also includes the 24kHz signal to identify the ordinary SIDs present. The two additional SID–like features seen at 37.5kHz are from the magnetic storm.
The first chart above is from Colin Clements using a dual axis sensor. The lower chart is the 3-axis recording by Roger Blackwell covering the 16th and 17th. They both show the storm in progress, with some significant magnetic transients around the time of Paul’s VLF transient. Roger’s chart clearly shows the initial transients at 01UT and 06UT. The source of the storm was a CME associated with the long duration M2.4 flare peaking at 02:09UT on July 14th.

There were periods of mild disturbance from the 20th to 24th of July, caused by a combination of coronal hole effects and a sector boundary crossing. None were particularly strong, with a maximum of about +/-50nT shown on Roger Blackwell’s charts.

Magnetic observations received from Roger Blackwell, Colin Clements, Gonzalo Vargas and John Cook.