

– Call to action

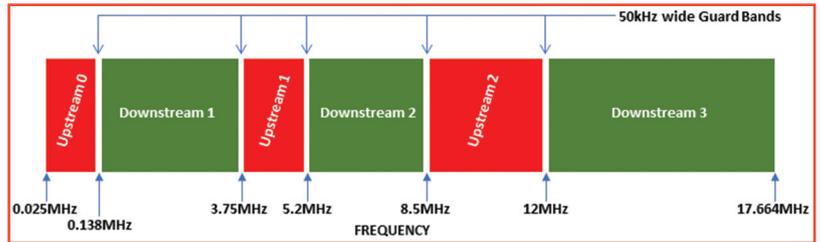
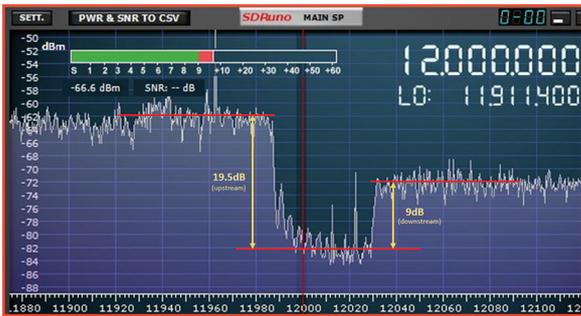


FIGURE 1: VDSL spectrum showing the position of the VDSL guard bands.

FIGURE 2: (LEFT) Example showing the level of VDSL interference around the 12MHz guard band.

What we need you to do

If you are suffering from VDSL interference, we need you to write to Ofcom to complain. It is only if enough numbers of radio amateurs complain to Ofcom that they will be made fully aware of the scale of the problem and hopefully they will finally take the problem seriously. Full details of the information required and how to make your complaint is on the RSGB website at www.rsgb.org/vdsl-reporting.

Rather than Members submitting identical letters, we would encourage you to submit a complaint to Ofcom in your own words, stressing your particular circumstances and the effect that the interference is having on you.

Nevertheless, you can make the submission using the pro forma you can download from the VDSL web page, www.rsgb.org/vdsl-reporting. We also encourage you to copy your submission to your local MP in order to raise the profile of the complaints. Feel free to include a copy of this article as background.

It would also be helpful if you can send a copy of your submission to the RSGB via vdsl@rsgb.org.uk so that we can track the number of complaints and pursue them with Ofcom. You can submit your complaint to Ofcom as follows:

- by letter to: Ofcom, Spectrum Management Centre, Baldock Radio Station, Royston, Baldock SG7 6SH
- by email: interference.report@ofcom.org.uk
- or by completing the form at <https://ofcomforms.secure.force.com/formentry/SitesFormAmateurRadio>

How to identify and measure VDSL

(In the UK, the current VDSL service uses a technology known as VDSL2. For simplicity, the generic term VDSL is used here throughout). VDSL uses the existing unscreened, twisted pair ‘telephone’ cables to carry high speed broadband data signals in the spectrum from 25kHz to 17.664MHz between the network provider’s street cabinet and the customer’s premises (typically a distance of up to a few hundred metres). Because VDSL is carried by twisted pair cables designed originally to just carry audio telephone signals up to 3.4kHz, the cables are not screened and are often poorly

balanced, and as a result the VDSL signals leak out creating the potential for interference on the HF bands. VDSL uses wideband, sophisticated digital coding and, on an HF receiver, the interfering VDSL signal appears as wideband noise, with no easily discernible characteristics. The effect is to raise the apparent background noise floor, in some cases by tens of dB.

The transmitted VDSL spectrum is divided into six discrete frequency bands; three of which are used to carry upstream data (ie from the subscriber towards the broadband network) and three of which carry downstream data (ie from the broadband network towards the subscriber). These six bands are frequency interleaved and are separated by small (approximately 50kHz wide) guard bands (see **Figure 1**). No VDSL signals are transmitted within these guard bands. Searching for these guard bands will enable you to identify the presence of VDSL interference. If a lower background noise level is observed within these guard bands when compared to the noise level immediately adjacent to the guard bands, then this indicates the presence of VDSL interference. The best guard bands to investigate are at 3.75, 5.2, 8.5 and 12MHz. When looking for the VDSL guard bands, you should be aware that the precise position of any of the guard bands may be displaced by up to 20kHz either side of the nominal frequency and that any particular VDSL system may not necessarily use all the up and downstream bands, so it may be necessary to check more than one of the guard bands.

Another means of identifying whether you are suffering from VDSL interference can be made using a specially developed software application called Lelantos. This uses sophisticated digital processing to uniquely identify whether VDSL interference is present in a radio spectrum recording. The instructions as to how to use Lelantos can be downloaded from www.rsgb.org/vdsl-reporting.

Using either approach, it is possible to identify that you are suffering from VDSL interference. This is adequate proof to justify making a complaint to Ofcom, and we encourage you to do so. However, if you wish, you can take it one step further. By measuring the size of the step in the noise level between the middle of the guard band and the noise level on frequencies adjacent to the guard

band (eg 50kHz below and 50kHz above the guard band) this gives an indication of how much the noise floor is being raised by the presence of the interference. **Figure 2** shows a spectrum display of the 12MHz VDSL guard band showing substantial VDSL interference. This spectrum display has been annotated to show the size of the step (in dB), an indication of the level of the interference that is being experienced.

If you don’t have a receiver with a spectrum display, then the same observations can be made by carefully recording the noise level as shown by an S-meter as you tune around one of the VDSL guard bands. Tuning up to 50kHz either side of the guard band centre should be sufficient to make the necessary measurements. You should see a dip in the background noise level within the guard band, rising either side as you tune away from the guard band.

Note that it is not necessary to make measurements at every one of the guard bands, although it may be interesting to do so in order to assess how the level of VDSL interference varies across the HF spectrum. It is best to perform the measurements with the receiver AGC turned off to avoid the risk that the AGC masks the variations in the noise level.

You may find higher or lower levels of interference than was recorded in **Figure 1**. Whatever level you observe, if you can see a decrease in the background noise level inside one or more of the VDSL guard bands then VDSL interference is present and will likely be masking genuine signals. If you find VDSL interference then please submit a complaint to Ofcom.

Further help and support

If you need further help in how to identify VDSL interference, to make the necessary measurements, to interpret the results or how to submit the complaint to Ofcom, then members of the EMC Committee are available to provide additional assistance. They can be contacted by email to vdsl.help@rsgb.org.uk.

www.rsgb.org/vdsl-reporting