



RSGB EMCC update to the Spectrum Forum - November 2022

Our licensed spectrum is being threatened on all sides - commercial demand makes some loss of allocation likely, pollution from RFI reduces the ability for low power communication, new coding schemes often result in increased interference.

EMCC aims to help people to:

- reduce the impact of interference on reception,
- minimise the interference we cause to shared spectrum users,
- influence standards to prevent unnecessary spectrum pollution and
- investigate new technologies to identify threats to the amateur service.

To continue this work, we are looking to recruit new volunteers to ensure we provide a first-class service to members, as new technologies using radio continue to grow. This work provides the basis for lobbying authorities suppliers and regulators to encourage reduction of harmful interference to protect the spectrum which is essential for all wireless communications.

Help Desk

The Help Desk continues to support members who report cases of radio interference, 127 cases were handled by the help desk in the year. These are generally of recognisable type, are efficiently processed, advice is given, and details recorded. Methods for further analysis of the archive of reports should improve diagnostic capability. An analysis of equipment type and manufacturer would help members avoid problem equipment.

In cases where multiple or questionable sources of interference exist, these are referred for further investigation. Topics included TVI, SMPSU's and battery chargers, pacemakers and their safety, solar PV installations including what to expect.

Investigations

The R&S FPC1500 spectrum Analyser is being used to investigate the excessive RF emissions from commodity electrical items including LED luminaires, their power supplies, and fast battery chargers. EMC and electrical safety reports for these items are being prepared for Ofcom and Trading Standards, in the knowledge that some product is cost reduced after certification to the detriment of EMC compliance and sometimes electrical safety. This work is reported through EMC RadCom column.

RSGB purchased an ENAMS (Electrical Noise Area Measurement System) receiver system designed and made by DARC in Germany to study long term changes in the radio noise floor at different locations across LF and HF frequencies. Trials in north London were subject to MF signal receiver overload caused by local broadcast transmissions. Notch filters are being designed to mitigate this problem in the UK. Analysis of trends of the data collected in Germany continue. A total of 52 on-line HF noise monitoring stations are monitoring in Germany, Austria, Switzerland, France, Belgium, New Zealand.

VDSL interference and complaints to Ofcom

We continue to provide support and expertise to members who are experiencing interference, from broadband systems. Having temporarily ceased on-site visits during the covid pandemic, we have restarted these where the interference is particularly severe or where unusual sources of interference are occurring. Additionally, we continue to assist members in submitting interference complaints to Ofcom. Cases of amateur transmissions affecting G.Fast broadband have been reported and the conditions and equipment effects are now largely understood. BT/Openreach



have taken steps to improve the situation, but not to completely resolve it. As with VDSL, the steady uptake of Fibre to the Premises (FTTP) will reduce harmful copper cable radiation and susceptibility cases generally.

Ofcom changes to licence conditions for EMF

Extensive modelling of antenna types, updates to the online emf app and measurements of antennas have provided more of the needed tools for compliance assessment. The EMF web page contains up to date advice and tools to help amateurs demonstrate compliance see [rsgb.org/emf](https://www.rsgb.org/emf)

Discussions with Ofcom have resulted in some important changes to the requirements:

- low power compliance accepted providing average EIRP is less than 10W and peak EIRP is less than 100W
- ICNIRP 2020 limits will be accepted without the need to demonstrate limb current compliance until reference levels are available for limb currents
- Compliance at frequencies below 10MHz does not require a minimum separation of the reactive near field boundary providing a reflection coefficient of 1 is used in the calculation (0.6 still used for frequencies above 10MHz)

These changes have been included in the online calculators which are being used by thousands to check and record their compliance. To support these changes measurements are being made by a joint Ofcom/RSGB team. First the measurement method was derived and tested including spatial averaging. The probes should not be used less than 0.5m from source antenna to prevent direct reactive coupling with the probe. Additionally, if a person is within 5m of the electric field probe they also perturb the reading.

Measurements were made for several compromised antennas, using calibrated Isotropic E and H field probes from Rhode and Schwarz and from Narda (purchased for this task). These antennas include G5RV/ZS6BKW, trapped dipoles and verticals, beams and non-resonant wires which confirmed the conservatism of these calculators.

RSGB now recommends a minimum separation of 2.4m (where possible) to prevent the need for further control measures when transmitting. This both meets the need to avoid touching of the antenna (possible RF burns) and uncertainties of near field values very close to antennas where reactive fields dominate. A presentation summarising this work was given at the convention together with a compliance clinic held to give guidance. Work continues jointly with ARRL and IRTS on EMF advice more PAEC's and RF safety.

Representation on National and international Standards committees

RSGB EMCC members continue to review relevant standards at BSI level and try to influence National Committees prior to voting on selective Key issues. IARU continue to inform the manufacturers, their agencies or representatives and Standards Bodies on matters of EMC compliance. CISPR Standardisation continues to be represented at high level by IARU and nationally at BSi. This positive engagement is preferable to taking the argument to the manufacturers directly and legal and market surveillance measures can be enforced.

The use of Statistical Process Control in volume electronic product manufacturing and the 80/80 EMC acceptance has been challenged in some CISPR domestic product standards.

Proof of principle software for the determination of radio protection limits based on multiple radio interference sources has been developed and is being trialled by CISPR. The protection of radio services up to 6 GHz is an emerging area of interest.

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