# Initial assessment of complaints of Interference to amateur radio stations and short wave enthusiasts

## Introduction

This proposal was raised at the Ofcom/RSGB Forum held at the Bedford headquarters of the RSGB on 7th April.

The following measurement methodology should be employed by Field Engineers for a trial period of 6 months. The intention is to quantify the level of interference experienced by amateurs in the presence of wideband interferes. This is not an exact measurement of the noise floor but a relative measurement of the interferer above the noise floor when measured at the receiver end of the amateur antenna feeder.

Field Staff are requested to forward results and comments to their Senior Field Engineer (SFE).

## Background

Since the introduction of the new EMC directive 'authorised users are entitled to protection from harmful interference from unauthorised radio services … (and) from non-radio sources' (see: http://www.rsgb.org/emc/pdfs/leaflets/emc09inbound.pdf).

This has given rise to complaints mainly associated with Powerline Adapters (PLAs) and plasma screen televisions. It is recognised that both amateurs and short wave listeners are working close to their equipment noise floor and that many instances of reported interference are well below any 'protection ratios' afforded to licensed broadcast reception (VHF radio and terrestrial TV).

## Action

It is understood that the ambient noise floor on HF varies both diurnally and seasonally. Hence care must be exercised to complete measurements (possibly across a number of bands) in the presence of the wideband interferer to identify the 'worse case' signal to noise figure.

It requires that an Ofcom receiver is connected to the complainant's antenna system and an assessment made of the system noise floor before tuning into the interferer.

| | Frequency | BW[1] | Detector | Level in dBµV | Antenna type[3] |
|---|---|---|---|---|---|
| system noise floor | 3.240MHz | 9kHz | peak | 28 | 160m/80m long wire 40m 1/2G5RV 20/15/10m 2ele mini tri-bander HFQI |
| Interferer signal | 3.750MHz[1] | 9kHz | peak | 45 | |
| Interferer signal | 3.666MHz[2] | 9kHz | peak | 37 | |
| Interferer signal | 3.562MHz[3] | 9kHz | peak | 45 | |
| system noise floor | 7.050MHz[4] | 9kHz | peak | 16 | |
| Interferer signal | 7.124MHz[5] | 9kHz | Peak | 26 | |
| signal amplitude above the noise floor[2] | 1=17dB 2=11dB | - | - | | |

| | | | | | |
|---|---|---|---|---|---|
| | 3=17dB<br>5=10dB | | | | |

**Table 1**

*See notes overleaf …*
*[1] See values in Table 2.*

*[2] If the results show that the measured interferer is 6 dB above the noise floor then the investigation can be accepted.*

*[3] The type of antenna is vitally important and as such should be described with enough detail so that the measurement results can be fully understood.*

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The presence of noise in the receiver pass band results in an error in the measured amplitude of the signal. If the amplitude of the signal is at least 6 dB above the receiver noise floor this error is small. Below this value the error increases significantly and adversely affects the accuracy of the measurement.

If the interferer lies below this 6 dB threshold then the case should be referred to the SFE before proceeding with the investigation further.

The default receiver settings shown in the table below are a compromise; but they do provide a set of repeatable measurement conditions.

| Frequency Range | Measurement Bandwidth | Detector | Measurement units |
|---|---|---|---|
| **150 kHz – 30 MHz** | **9 kHz[1]** | **Peak[2]** | **dBμV** |
| **30 MHz – 1000 MHz** | **120 kHz** | **Peak** | **dBμV** |

Notes:

1. CISPR bandwidth to asses the interference potential to a shortwave broadcast transmission.

2. Correct for modulated and unmodulated stable carriers.

   [a] HomePlug 1.0 PLA : 84 equally spaced sub-carriers in the frequency range 4.5 – 21 MHz. The 30 dB notches in the amateur bands reduce the number of useable sub-carriers to 76. Characterised by a 1 second 'tick' when idling (no data throughput).

   [b] DS2 PLA (including Comtrend): 1536 equally spaced sub-carriers in the frequency band 2 – 28 MHz. Number of sub-carriers reduced by amateur band notching. Each modem is polling every 1 ms for network activity which produces the characteristic 1 kHz tone.

   [c] Broadband interference such as that produced by plasma screen televisions may require a more pragmatic approach in assessing the true noise floor.

**Table 2**

Please ensure that the results of these measurements are reported in the Siebel case notes.

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|---|---|
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**Table 3**