

ACMA – BPL Measurement Day Report

11 January 2007

By Justin Giles-Clark VK7TW

Attendees:

- Colin Payne – ACMA Regulation and Compliance Branch Melbourne
- David Long – ACMA Regulation and Compliance Branch Hobart
- Phil Wait VK2DKN – WIA
- Justin Giles-Clark VK7TW – REAST
- Conrad Kley VK7HCK - Complainant
- Greg Todd VK7YAD - Observer
- Harvey Skegg VK7HK - Observer

Background:

Mr Kley made an initial complaint of unacceptable levels of interference from BPL emissions in November 2005 and then again on the 11 September 2006, and these have been the subject of ongoing investigation by ACMA. ACMA detected emissions at the Quoin Ridge ITU monitoring station (20km away) in November 2005, however that is no longer the case possibly due to the use of wireless technology for the BPL back-haul network. ACMA staff also undertook further measurements at Mt Nelson on 24/11/05, 28/06/06 and 14/07/06.

Following Mr Kley's follow-up complaint of 11/09/06 the ACMA compiled their measurement results into a report which was released at the end of November 2006. The following is a short summary of ACMA's 14 July 2006 measurement results showing emission levels in the bands Mr Kley's complaint related to:

| Frequency (MHz) | 14/07/06 measurements | | Analyser Range | Comment |
|-----------------|---------------------------|----------------|--------------------------------|---|
| | dBuV/m | MHz | | |
| 3.5-3.7 | 34.1 64.0 ¹ | 3.53 3.56 | Wideband span 2-6Mhz span | BPL is above the noise in this band. |
| 7.0-7.3 | 51.1 42.4 | 7.22 7.25 | Wideband span 6-10MHz span | BPL emission across whole band |
| 14.0-14.35 | 40.3 43.9 | 14.28 14.34 | Wideband span 10-16MHz span | If software notching is in use it is ineffective BPL detected across whole band |
| 21.0-21.45 | 46.5 34.3 | 21.44 21.44 | Wideband span 16-23MHz span | Notching deployed however upper end of notch not effective |
| 28.0-29.7 | 52.6 53.3 | 29.1 29.0 | Wideband span 23-30MHz span | Narrow notch employed remainder of the band has high level BPL emissions. |

At the time ACMA suggested that Aurora was not utilising the Jeizer network management software which would ensure the BPL system operated at the lowest practical power levels in the vicinity of Mr Kley's residence.

¹ Large Spike, similar to the spike at 2.81MHz – may not be BPL.

The Ionospheric Prediction Service's ionosonde emissions were detectable at 11.3MHz but were masked by the BPL emissions from 14MHz upward.

ACMA commented in the report that receiver selectivity must be considered when a vendor is deciding the degree of software notching to implement and the use of sensitive communications receivers may require front-end filters to reduce or prevent front-end overloading, inter-modulation distortion and desensing.

The ACMA report substantiates the claims made by Mr Kley that the Aurora BPL system is causing interference and greatly reducing his ability to operate licenced amateur radio equipment.

Latest Series of Measurements:

On 11 January 2007 ACMA undertook another round of measurements with the assistance of Colin Payne who is an EMC measurement specialist within the ACMA Regulation and Compliance Branch. Measurements were undertaken at Mr Kley's residence using equipment flown in from Melbourne.



David & Colin observing the HF spectrum with test equipment and test loop antenna.

Measurements were taken using a flat-response loop antenna and also using Mr Kley's quad and vertical antennas so a comparison could be made between the calibrated professional antenna and tuned amateur antennas.

Initial findings indicated that higher frequency signals were showing lower levels using the calibrated antenna compared to the tuned amateur antennas, possibly due to the different locations and heights of each antenna.

There was correlation between what Mr Kley was reporting using the “S” signal strength scale and what was measured using the test equipment on the same antenna.

Notch measurements showed about a 20dB notch depth which still resulted in about an S3-4 being experienced by Mr Kley within a notch. There also appeared to be remnant carriers within the notch.



David, Colin and Conrad discussing the results using Conrad’s antennas to measure emission levels.

It was acknowledged that Aurora has through notching and wireless backhaul reduced the level of emissions over the period of the trial. Conrad has requested further reductions in emission levels including the widening of notching in various bands and notching of the 10m band.

We await with interest the release of measurement results from this round of testing.