

15 N Mill Street
Nyack, New York 10960
T: 845.348.3181
F: 845.348.3184

September 3, 2004

James R. Burtle
Chief
Office of Engineering and Technology
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: Experimental Station WB9XVP (File No. 0136-EX-ST-2004 at Cottonwood (Yavapai County) Arizona – Six Month Progress Report and Request of National Association for Amateur Radio for Immediate Cessation of Operation and revocation of Special Temporary Authorization

Dear Mr. Burtle:

This letter responds to your letter of September 1, 2004 regarding Experimental License WB9XVP, a broadband over power lines (“BPL”) system in Cottonwood, Arizona, licensed to Electric Broadband, LLC (the “Licensee”). The Licensee hereby responds to the Request For Immediate Cessation of Operation and Revocation Of Special Temporary Authorization submitted to the Federal Communications Commission (“FCC”) in the letter of Christopher D. Imlay dated August 16, 2004 (the “Complaint”).¹ The Complaint seeks termination of the above-referenced authorization, as well as the imposition of fines against the Licensee. Contrary to the allegations in the complaint, the Licensee has taken significant steps to respond to the various interference notices listed in the Complaint, including the July 31, 2004 letter of the Verde Valley Amateur Radio Association (“VVARA”). In particular, specific steps, as described further below, have been taken to eliminate the possibility of any interference at the frequency described in the Complaint.² Therefore, the actions requested in the Complaint are both unnecessary and unwarranted.

¹ The Commission's letter also notes that the Licensee's six month progress report was due July 12, 2004 based upon the original grant date of the first location for the license. The Licensee had calculated the date of this report based upon the grant date (March 15, 2004) for the one operational system within the three licensed locations. Due to vendor problems, the other locations were never brought into operation. The Licensee apologizes for this confusion and will file the required report on or before September 16, 2004 as requested.

² This response, as well as further discussion of specific interference mitigation steps and results will be included in the six month report.

In April 2004, prior to the receipt of any complaints, the Licensee, with the assistance of its equipment vendor, Mitsubishi, conducted Part 15 compliance testing, including testing following the testing guidelines set forth in *Carrier Current Systems, including Broadband over Power Line Systems*, Notice of Proposed Rulemaking, ET Docket No. 03-104 (February 23, 2004), of the new system and found it to be within the Part 15 requirements. From that time until receipt in early August (August 5th – VVARA letter and August 19th – the Complaint (forwarded by the FCC)), the Licensee focused its efforts on operation of the system under the experimental license.

Upon receipt of the complaint, the Licensee immediately began making arrangements to perform necessary tests to verify the complaints and respond accordingly. Through one of its partners in these operations, Mountain Telecommunications Inc., the Licensee acquired an Advantest Spectrum Analyzer and Mag Loop antenna and scheduled an onsite visit of Mitsubishi's engineers from Japan. On August 18th and 19th, comprehensive emissions tests were conducted.³

The tests conducted indicated the existence of an extremely high noise floor in the Sawmill Cove test area, as well as certain other very strong signals at frequencies consistent with the Complaint. The noise floor, in excess of 40 dBuV across all measured frequencies, created certain challenges in verifying the measurements set forth in the Complaint. Indeed the tests indicated the existence of the complained of signals when the experimental system was shut off. Therefore, to ensure compliance of the experimental system while further tests were conducted, on August 20, the Licensee modified the link distribution within the experimental system to cause it operate on carrier frequencies outside of the 80m and 30m amateur radio bands. This system change ensures that there will be no emissions in those bands as described in the Complaint.

In addition, to the above-findings and actions, the Licensee discovered that the vendor equipment and software was designed with self-adjusting gains in the system nodes. This design could permit the system to self-adjust to power levels that would result in Part 15 violations. Although this design problem does not appear to have contributed to the results described in the Complaint, the Licensee has notified the equipment vendor and is working with it to modify the equipment to eliminate this design flaw.

Surprisingly, following cessation of transmissions on the system in the complained of amateur bands, the Licensee received correspondence, on August 26, 2004, from an amateur operator claiming interference in the 80, 30 and 20m bands during tests conducted in the same area on August 21, 2004, the day after the system links were modified and the system was not operating in those bands. The 20m band also was not in operation near the site that the operator conducted his tests.

As a result of this correspondence, the Licensee hired an independent RF engineer to conduct additional tests at the site described in the Complaint.⁴ The results of this second round of testing verified earlier testing, as well as yielding some very interesting additional findings. As shown in Attachment C, in the same test region at multiple locations, both with the

³See Attachment A for a description of the test setup.

⁴See Attachment B for a description of the test setup.

experimental system shut off and with it on, and within a band in which the system is not operating, there is evidence of a data carrier at 3.15, 3.864, and 4.68 Mhz. In addition, extremely powerful signals from a local licensed AM radio station also were measured and are shown in Attachment C. These signals are being re-radiated by the power grid, a common phenomenon. Although the unidentified carrier signal likely represents the data signals heard and described in the Complaint, it is not caused by the experimental system.

As a result of the Licensee's testing, as described above, it is apparent that the interference described in the Complaint is not the result of the Cottonwood BPL operation. Rather, the existence of an extremely high noise floor, combined with the presence of an unidentified data carrier signal measurable at different frequencies and the existence of re-radiated AM radio signals within the bands discussed in the Complaint explains the general "it's noisy everywhere" nature of the Complaint and the VVARA filing, as well as the specific measurements described in the Complaint.

The Licensee will continue its tests of system compliance with Part 15 of the FCC's rules, as well as investigations into any complained of interference from the system. Indeed, such testing and investigation is one of the primary goals of the experimental authorization and should be encouraged by the FCC to provide "real life" data regarding BPL system operations. As the Commission noted in the NPRM, these systems "could play an important role in providing additional competition in the offering of broadband services to the American home and consumers, and in bringing Internet and high-speed broadband access to rural and underserved areas."⁵ Comprehensive operational testing and experimentation, like that being conducted by the Licensee, should continue in order to advance the art and determine an effective way for these two important technologies, BPL and amateur radio, to coexist and serve the public interest.

Therefore, based upon the Licensee's investigations and the specific actions taken to identify and eliminate any possibility of operations that might be the cause of the reported harmful interference, as well as the evidence provided that the experimental system likely is not the source of the measured interference, the relief requested in the Complaint is unwarranted and should be denied. The Licensee would welcome, however, the opportunity to work cooperatively and constructively with the ARRL to further test and refine the BPL systems.

Respectfully Submitted,

cc: Christopher D. Imlay, Booth, Freret, Imlay & Tepper, P.C.

⁵NPRM at ¶ 1.

Attachment A

Test was performed using the following equipment:

- Spectrum Analyzer: Advantest R3132 calibrated 5/2204
- Antenna: AHA Systems SAS562B 18" Magnetic Loop Antenna calibrated 7/2004

The antenna was placed on a wooden tripod approximately 10M from each node with the antenna oriented towards the BPL node.

Attachment B

Test was performed using the following equipment:

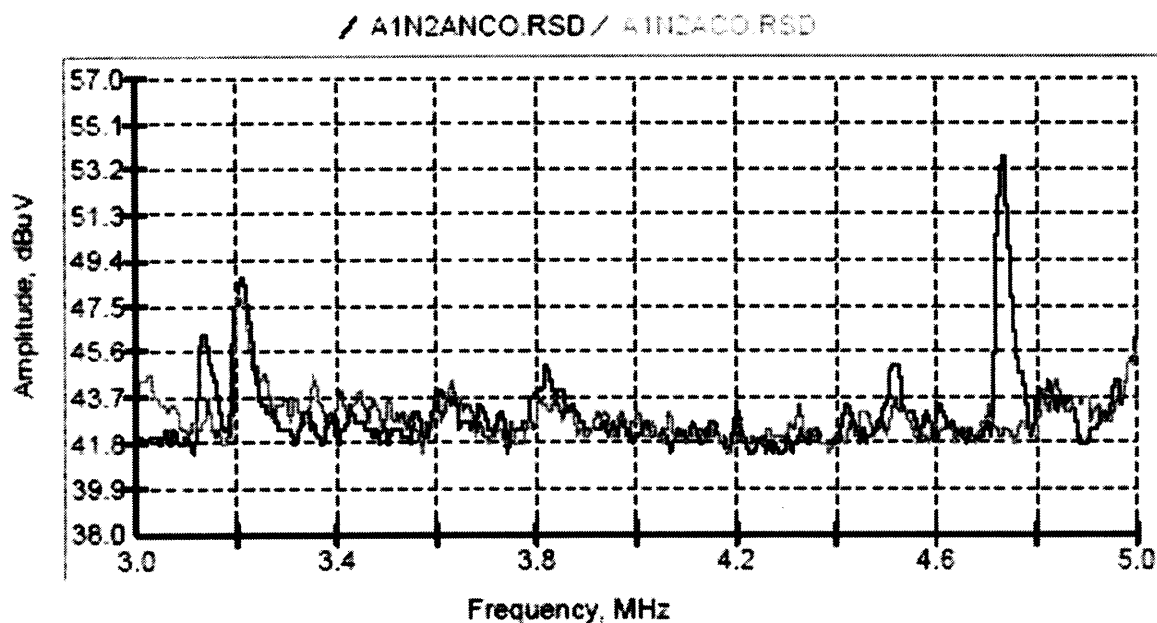
- Spectrum Analyzer: Tektronics 2712
- Antenna: AHA Systems SAS562B 18" Magnetic Loop Antenna calibrated 7/2004
- AM Field Strength Meter: Potomac FIM-41
- Notebook Computer: Gateway 450SX, SN 3501405

18" antenna was placed on a wooden tripod close to the area in question near the Sawmill Cove town homes. The same antenna setup was also used at the Charter school, but placed 10M from the Pad Mount transformer.

Each reading was measured for at least 1 minute using the max hold setting on the analyzer. Tests were conducted with the BPL system turned on and then with the BPL system turned off.

Attachment C

Charter School Parking Lot



Blue = System off (Noise Floor); Green = System on

3.2 MHz - Second Harmonic of KYBC-AM

3.15 and 4.68 MHz - Data Carrier

No antenna correction applied

Preamplifier correction -57 dBuV added

Data acquired at: 8/27/2004 10:59:37 AM

A1N2ANCO.RSD and A1N2ACO.RSD

Center 4 MHz

RefLvl 57.0 dBuV

RFAtt 0 dB

Span .2 MHz/div

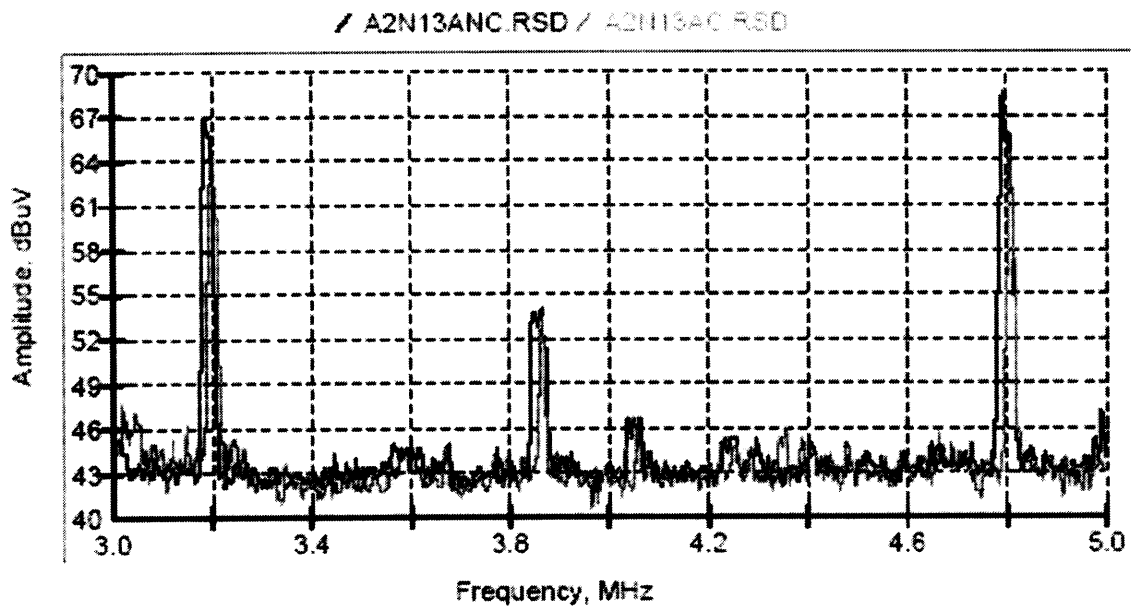
ResBW 300 Hz

SA Scale 10 dB/Div

SwpSpd 100 msec/div

Mixer -30 dBm

Just East of Pile of Rocks



Blue = System off (Noise Floor); Green = System on

3.2 MHz - Second Harmonic of KYBC-AM - Re-radiated by power line

4.8 MHz - Third Harmonic of KYBC-AM - Re-radiated by power line

3.864 MHz - Data Carrier not identified

No antenna correction applied

Preamp correction +57 dbuv added

Data acquired at: 8/27/2004 1:43:46 PM

A2N13ANC.RSD and A2N13AC.RSD

Center 4 MHz

RefLvl 57.0 dBuV

RFAff 0 dB

Span .2 MHz/div

ResBW 300 Hz

SA Scale 10 dB/Div

SwpSpd 1 sec/div

Mixer -30 dBm