



**ARRL** *The national association for*  
**AMATEUR RADIO**

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May 31, 2007

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**RE: Ambient Corporation Broadband Over Power Line System  
at Briarcliff Manor, New York; Continued Request for Immediate  
Cessation of Operation by, and Non-Renewal of Experimental  
Authorization WD2XEQ, File No. 0118-EX-RR-2005; Enforcement  
Bureau File No. EB-06-SE-083.**

Greetings:

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This office has received copies of the letter of the Chief, Spectrum Enforcement Division, Enforcement Bureau dated May 21, 2007 and addressed to Dr. Yehuda Cern of Ambient Corporation regarding the March 29, 2006 complaint filed by ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL). The ARRL complaint addressed harmful interference caused by the captioned broadband over power line (BPL) facilities operated pursuant to the above-captioned Experimental Authorization by Ambient.

The May 21, 2007 letter refers to ARRL's on-site test results included with its March 29, 2006 complaint, which demonstrated that the radiated emissions from the Ambient facility are sufficiently high as to cause strong interference to the operation of mobile and fixed Amateur Radio stations in the area of Briarcliff Manor, NY. The letter also notes that Ambient was required to file progress reports six months from the date of grant of the Experimental Authorization. The progress report was specifically required to include a description of measurements and results demonstrating compliance with the Commission's Rules, including the radiated emission limits of Section 15.109 of those rules. According to the May 21 letter, Ambient submitted its "most recent" six month report February 5, 2007. In it, Ambient submitted no measurements at all. It merely stated that certain Amateur high frequency bands were notched, and claiming "significant advancements" in its technology.

The May 21 FCC letter notes that the Commission, on March 16, 2007, asked Ambient for information demonstrating compliance with "all conditions" (sic) of Ambient's experimental operation. Ambient apparently never responded to that letter. So, the May 21 FCC letter directs Ambient to submit measurements made prior to its February 5, 2007 "progress report." New measurements must be taken if Ambient did not do any in the areas referenced in the ARRL complaint dated March 29, 2006, and submitted to the Commission within either thirty or twenty days.<sup>1</sup> If the measurements show noncompliance with Section 15.109, that has to be noted, and Ambient must describe the means by which its system will come into compliance with the terms of the Experimental Authorization.

### **I. Ambient's BPL System Should Have Been Shut Down Long Ago**

ARRL restates its objection to the Commission's inexplicable inaction in the face of the continued operation of this BPL system above the permitted radiated emission limits since ARRL's initial complaint. ARRL further objects to Ambient's repeated misrepresentations in its six-month reports claiming that its Briarcliff Manor BPL system meets FCC emission limits. ARRL further objects to the continued interference caused by the BPL system, which was repeatedly noted by local radio amateur Alan Crosswell.

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<sup>1</sup> The May 21, FCC letter specified a response within "thirty (20) days" of the date of the May 21 letter.

Finally, ARRL objects to the failure of Ambient to notch the Amateur bands system-wide.

ARRL filed complaints on October 12, 2004; December 17, 2004; January 7, 2005; March 17, 2005; January 6, 2006 and March 29, 2006, each of which reported ongoing harmful interference caused by the unlawful operation of Ambient's BPL system in Briarcliff Manor. The complaints included technical reports on the result of tests conducted by ARRL. The conclusion reached in each complaint, which ARRL now reiterates, is that this facility was, and now still is, causing harmful interference to Amateur Radio stations and must be required to cease operation immediately.

Although the Commission's May 21, 2007 letter to Ambient refers to Ambient's failure to comply with Condition #5 of the Experimental Authorization, no mention is made of Condition #1 of that Experimental Authorization. That condition requires that if "any interference" occurs, the holder of the authorization will be subject to immediate shut down. Interference has repeatedly occurred, and it has been witnessed and verified by a member of the Commission's Enforcement Bureau staff. Yet no action has been taken whatsoever to terminate this experimental authorization over a period of more than two and one-half years. This is inexcusable. Even now, if Ambient, in response to the May 21, 2007 FCC letter, simply does after-the-fact measurements, and even if they show (which, if conducted honestly, they will) that the system is not compliant with the terms of the authorization or the Commission's Section 15.109 rules, all that is called for is a "description of the steps Ambient intends to take to bring the system into compliance with the conditions of its experimental license." This is too little, too late and an abdication of the Commission's responsibility to protect its licensees from interference from unlicensed RF devices. The Commission's obsessive compulsion to avoid any bad news about BPL has clearly driven its multi-year inaction. Had this been any other experimental authorization dealing with any technology other than BPL, the experimental authorization would have been terminated long ago.

The Commission's May 21, 2007 letter once again attempts to place the fox squarely within the henhouse by asking Ambient, which ARRL has shown repeatedly in the past to have dissembled in its reports to the Commission on this subject, to conduct its own compliance measurements. The Commission should send its own staff out to do measurements instead. Furthermore, once again, it has not been required that the complainant, or ARRL representatives, be invited to attend the measurements that Ambient is to conduct. Nor has it required that Ambient conduct measurements based on the operation of the system as it has been operated (rather than turning down the power and reporting that all is well with the system). Had these requirements been imposed, a fair evaluation of the system would have been possible. As it is, however, ARRL has avoided the problem by conducting its own measurements of the system, which show that the system is not compliant.

**The Ambient System at Briarcliff Manor is Grossly Noncompliant  
And Must be Shut Down**

Attached hereto is a technical report of measurements done by ARRL's BPL interference expert, Ed Hare, at Briarcliff Manor on May 24, 2007. The report conclusively establishes that the Ambient BPL system "continues to operate well above the Part 15 emissions limits that are stipulated as a condition of its Experimental license."

Given the present status of this system, and the repeated inability of Ambient to operate its facility in compliance with the Commission's rules or the terms of its experimental authorization, ARRL again urges that the experimental authorization be terminated immediately, pursuant to Section 5.111(a)(2) of the Commission's rules. This rule obviously applies to Ambient and to all holders of experimental authorizations, and states as follows:

When transmitting, the licensee must use every precaution to ensure that the radio frequency energy emitted will not cause harmful interference to the services carried on by stations operating in accordance with the Table of Frequency Allocations of part 2 of this chapter...If harmful interference to an established radio service develops, the licensee shall cease transmissions and such transmissions shall not be resumed until it is certain that harmful interference will not be caused.

It is beyond any reasonable dispute that this rule, which is mandatory and not discretionary, requires that the Briarcliff Manor Access BPL system must be shut down. It is long past time that the Commission enforce its own rules.

**The Commission Cannot Further Renew the Ambient Experimental Authorization**

It is a mystery, in fact, why this experimental authorization has been continued, inasmuch as the rules governing BPL systems were final a long time ago. Nothing can be gained at this point by "experiments" using obsolete, non-grandfathered BPL hardware that causes interference. Ambient has done nothing to install second-generation BPL hardware, including couplers that have been authorized through the Commission's equipment authorization procedures.

Ambient's Experimental Authorization, WD2XEQ, File number 0118-EX-RR-2005, expires August 1, 2007. There can be no justification for renewing this authorization under the circumstances here. ARRL objects in the strongest possible terms to any further extension of this authorization and demands that the licensee be instructed to cease operation not later than August 1, 2007.

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The continued operation of this facility pursuant to an experimental authorization subverts the Commission's regulatory scheme for BPL interference avoidance. For example, because the Ambient Briarcliff Manor BPL system is operated under an experimental authorization, the Commission has determined (again, inexplicably) that it does not have to be included in the publicly available database. Therefore, those licensees who suffer interference from the excessive radiated emissions from the system have no indication how to complain about it, or ascertain the source of the interference. Causing Ambient to operate in accordance with the BPL rules rather than allowing it to hide behind its experimental authorization would at least be consistent with the Commission's regulatory plan for BPL, however inadequate that plan is in terms of interference avoidance.

Accordingly, ARRL again requests that the Commission immediately advise Ambient that it must cease operation of the Briarcliff Manor, NY BPL system, and that the experimental authorization will not be renewed after August 1, 2007.

Kindly address all communications on this subject to the undersigned counsel.

Yours very truly,

*Christopher D. Imlay*

Christopher D. Imlay

cc: George Y. Wheeler, Esq.  
Holland & Knight  
2099 Pennsylvania Avenue, N.W.  
Washington, D.C. 20006  
*Counsel for Ambient Corporation*  
(via E-Mail, w/attachment)

and to all Commissioners

# Additional Testing of the BPL System in Briarcliff Manor, NY

Author: Ed Hare, ARRL Laboratory Manager, [W1RFI@arrl.org](mailto:W1RFI@arrl.org)

Test engineer: Ed Hare, ARRL Laboratory Manager, [W1RFI@arrl.org](mailto:W1RFI@arrl.org)

Report Revision Date: May 24, 2007

## History and Summary:

The Broadband over Power Line (BPL) system in Briarcliff Manor, NY is operated by the Ambient Corporation under its Experimental license, WD2XEQ. ARRL has previously done testing of the interference from this BPL system. Throughout the course of that testing, ARRL has repeatedly found that the system operates at emissions levels strong enough to cause significant harmful interference to the Amateur Radio Service. It has also found on several past occasions that parts of the system were operating at levels exceeding the emissions limits for BPL systems operating under Part 15 of the FCC rules.<sup>1</sup>

Several interference complaints have resulted from the operation of this system. In several instances, the BPL manufacturer, the Ambient Corporation, attempted what it characterized as “adjustments” to the system to mitigate interference.<sup>2</sup> These adjustments have not generally corrected interference, and although ARRL has sometimes found interference to be partially mitigated after Ambient makes adjustments, follow-up measurements have shown such progress to be temporary in response to complaints.

On May 24, 2007, ARRL Laboratory Manager Ed Hare made a site visit to assess the present status of the system and to make additional measurements. Because the time to perform testing of the system was limited in this case, Hare selected only a few locations to make representative measurements of the system and its Amateur band notching. These tests showed that the system continues to operate well above the Part-15 emissions limits that are stipulated as a condition of its Experimental license.

Ambient has been operating this BPL system under an experimental license<sup>3</sup> since June 21, 2002<sup>4</sup>. Among other requirements, the Experimental license requires that Ambient operate the system without causing harmful interference to licensed operation or be subject to immediate

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<sup>1</sup> Although this system is operating under an Experimental license, one of the conditions of its operation is that it must not exceed the Part 15 emissions limits that apply to BPL and intentional emitters.

<sup>2</sup> These “adjustments” have come to be called “notching” by the BPL industry, although in general, these techniques do not create notches in their spectrum use, but either move blocks of spectrum around or attempt to turn off blocks of carriers.

<sup>3</sup> Search for “Ambient” at the FCC URL <https://gulfoss2.fcc.gov/prod/oet/cf/els/reports/GenericSearch.cfm>.

<sup>4</sup> Ambient was originally licensed as WB9XQT for specific locations and frequencies in Westchester County, NY. On July 28, 2003 Ambient was granted an Experimental license under the call sign WD2XEQ. On September 3, 2003, this license was issued to permit Ambient to operate BPL systems nationwide, from 1.7-88 MHz.

shutdown and that it submit 6-month progress reports<sup>5</sup> that show compliance with Part 15.109 of the FCC rules.

Among the documents that were previously filed<sup>6</sup> as part of the records of this Experimental license are a number of reports of harmful interference to a mobile station operating in the Amateur Radio Service<sup>7</sup>.

## Test Conditions:

The testing for this report was done with the FSH3 quasi-peak mode with a 9000 Hz measurement bandwidth between 1.7 and 30 MHz and a 120 kHz bandwidth for measurements made on 30-50 MHz. To the extent possible and practical, ARRL followed the test methods outlined by the FCC in the BPL Report and Order, but measured only at a location across the street from the coupler being measured.

## Test Equipment Used:

Description	Manufacturer	Model	Serial number	Date Calibrated	Notes
EMC Spectrum Analyzer, 0.1 MHz to 3 GHz	Rohde and Schwarz	FSH3	102393	1/19/2005	Peak, quasi-peak or average measurements
Biconical antenna, 20-200 MHz	ETS-Lindgren	3104C	00052201	8/26/2005	New, placed in service 11/1/2005
24-inch loop antenna	EMCO	6502	00051644	11/9/2005	New, placed in service 11/1/2005
Non-metallic	Mil. surplus	N/A	N/A	N/A	

<sup>5</sup> Some of these reports are not available on the FCC web page because Ambient asked that they be treated as confidential. However, others are available at

[https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/65107.0.02522345616.pdf\\_stripped.pdf](https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/65107.0.02522345616.pdf_stripped.pdf),  
[https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/67258.0.95293196344.pdf\\_stripped.pdf](https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/67258.0.95293196344.pdf_stripped.pdf) and  
[https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/69555.0.74399685913.pdf\\_stripped.pdf](https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/69555.0.74399685913.pdf_stripped.pdf).

<sup>6</sup> The complainant, Alan Crosswell, recently testified at a hearing of the Westchester County electric-utility board that the lack of corrective action has led him to simply abandon his complaint.

<sup>7</sup> These reports were filed by Alan Crosswell, and by ARRL. They are available on the FCC web site at [http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6516182610](http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6516182610), [https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/68798.0.35033256311.pdf\\_stripped.pdf](https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/68798.0.35033256311.pdf_stripped.pdf) and [https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/69871.0.55463268964.pdf\\_stripped.pdf](https://gulfoss2.fcc.gov/prod/oet/els/forms/blobs/69871.0.55463268964.pdf_stripped.pdf). A comprehensive report on ARRL's findings at this location was filed with the FCC as part of ARRL's complaints. It is available at <http://www.arrl.org/~ehare/bpl/bcm/bcm-3-17-2005.doc>. Other complaints or reports of strong interference levels filed by other Amateurs in the area are available at [http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6514682097](http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6514682097), [http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6514683874](http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6514683874) and [http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native\\_or\\_pdf=pdf&id\\_document=6515284064](http://gulfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6515284064).

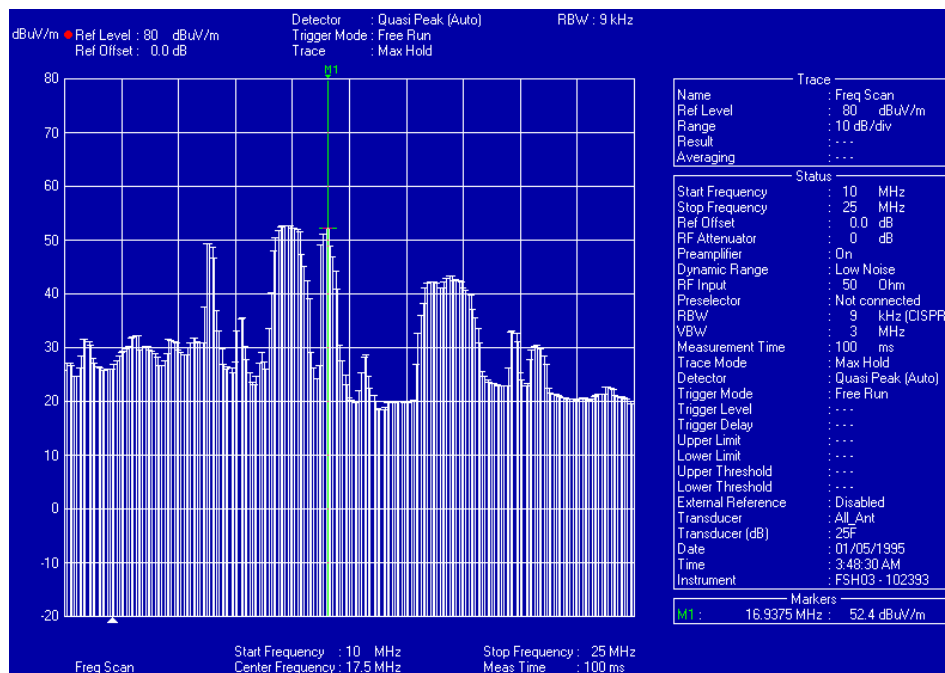
tripod 25-foot BNC coaxial cable	Pomona	25-foot	N/A	Measured 12/5/2006 in ARRL Lab	Retest before each use
General coverage Amateur Radio transceiver	ICOM	IC-756 FCC ID AFJIC- 756	02071	Not calibrated	Communication receiver used for monitoring only
Loaded mobile whip antenna, adjustable coil	MFJ	MFJ- 1668	None	Not calibrated	Communication antenna used for monitoring only

## Test Results:

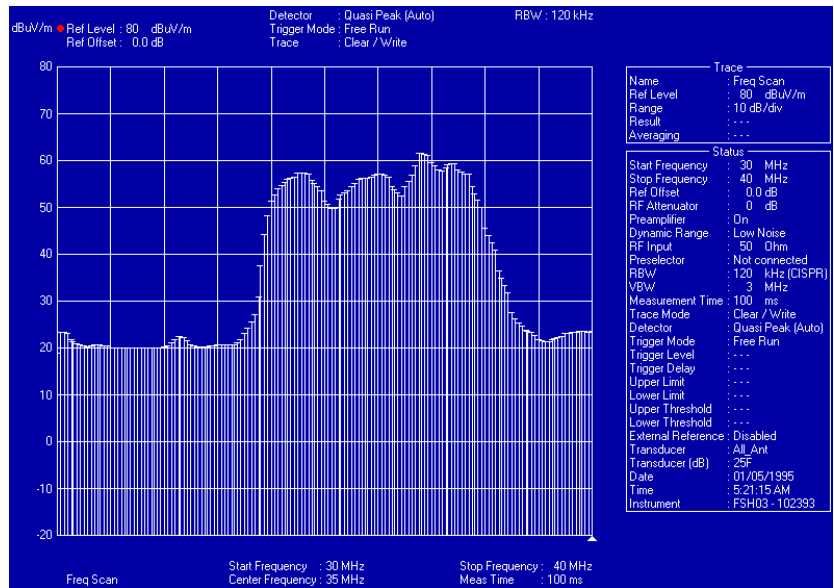
### Background:

### Field Strength Measurements:

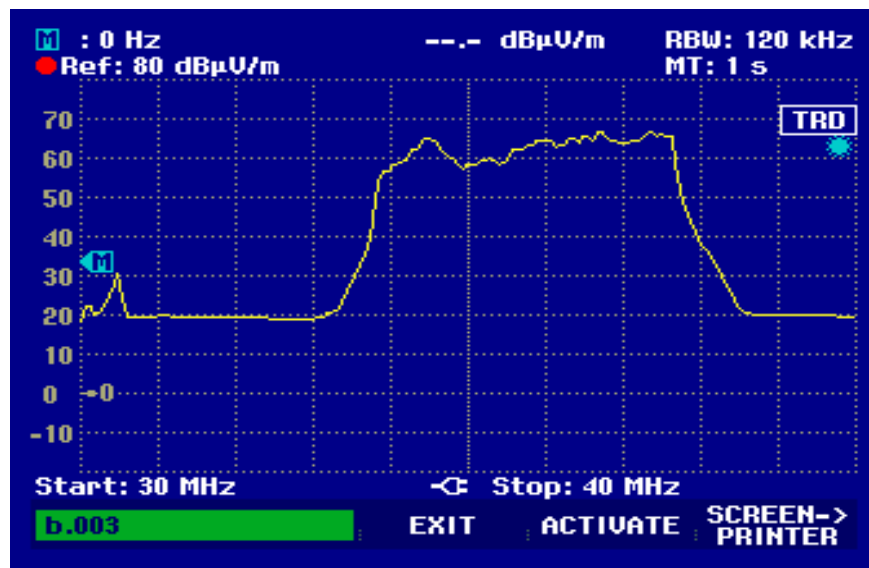
#### Location #1 - 121 Schrade Road



*Figure 1 -- This measurement was made at 121 Schrade Road in Briarcliff Manor, NY. The test loop was oriented parallel to the overhead line, at a height of one meter. The test was made across the street from the coupler feeding the BPL signal into the MV line. The slant-range distance was not measured, but is estimated to be 13.5 meters. At that distance, the Part-15 emissions limit is 43.4 dBuV/m, quasi-peak in 9 kHz. The above data, uncorrected for slant-range distance, show a quasi-peak level of level of approximately 53 dBuV/m.*



**Figure 2 --** This measurement was made on Woodside Ave, near the substation, of the coupler located at GPS coordinates 41.14300N and 73.82671W. The test location was across the street from the injector, at a horizontal distance of approximately 9 meters. The slant-range distance to the injector being measured was estimated at 12.7 meters. Not correcting for height, above 30 MHz, the emissions limit at this distance is approximately 37 dBuV/m. This measurement shows an emissions level of approximately 62 dBuV/m, approximately 25 dB above the limit.



**Figure 3 --** This measurement, previously provided to the Commission in an ARRL complaint, was made in December 2005, at the same location. The emissions level at this location has not changed appreciably.