

**Before the
Federal Communications Commission
Washington, DC 20544**

In the matter of
Inquiry Regarding Carrier Current Systems,
Including Broadband over Power Lines.

ET Docket No. 04-37

To: The Commission

I. No interference from HomePlug Devices (Section II, Number 21).

The commentary in this section of the NPRM claims that there is wide deployment of Homeplug devices, in situations that potentially could cause interference to licensed Amateur Radio Service stations and that no claims of interference exist. Further, the commentary states extensive testing with ARRL didn't reveal any interference potential with licensed Amateur Radio Service stations.

The context of the section leads the reader (and the general public) to believe that carrier current systems can and do co-exist with licensed Amateur Radio Service stations with any harmful interference.

While the statements do support that supposition, it's not the "whole" truth. The Homeplug specification restricts or "notches out" HomePlug devices from producing RF energy within the frequencies allocated to the Amateur Radio Services. Without this "notching", these devices would cause interference, and did cause interference prior to the ARRL working with the HomePlug alliance to implement the change to the specification to include restricting RF power in the frequencies allocated to the Amateur Radio Service.

HomePlug devices do not need to meet this restriction to satisfy Part 15 certification, and hence is not part of the FCC rules. Manufacturers of HomePlug devices do have to adhere to the restriction to use the HomePlug trademark and other privileges of being a member of that alliance.

The FCC should make the notching a requirement for all carrier current devices certified under Part 15. In the HomePlug case, it's proven to work.

II. Equipment Authorization.

Carrier Current systems deployed on the scale proposed for BPL are new and unseen. The effects of conducting RF on long power lines is not clear – no significant modeling or testing has been done to date. These power lines can be over head, with varying

spacing between them; multiple conductors; varying spacing to ground; varying connections to support equipment. These power lines can also be buried, or run in underground conduits, with pedestals at periodic intervals.

The FCC should require the equipment authorization method to be certification, rather than verification, for at least the first two years of equipment deployment. Further, testing procedures should be enhanced thru required participation in a national standards forum for test develop, such as ANSI.

III. Standards efforts.

Deployment of additional systems, and trials should be severally restricted (to no more than 1% additional) until a standard is completed for carrier current systems. This standard must come from an existing, accredited standards body, such as the IEEE¹, ANSI, or IETF.

In this technology driven era, communications equipment that is driven by standards produces better products, lower cost products, and gives the user or customer better choices.

Consider the implementation of LANs – IEEE 802.3 has been a solid success. Wireless data connectivity is almost ubiquitous due to IEEE 802.11 standard. DSL systems are supported by ANSI standards, leading to a variety of equipment choices and strong competition. The cable modem industry produced the DOCSIS standard that now allows customers to choose from a variety of products.

The telecommunications arena doesn't have as strong a set of standards for higher speed carriers such as T1, and DS3 – equipment interoperability is low, diversity of vendors is low, and cost of equipment is high.

IV. Database of Equipment installations

Deployed Access BPL should be registered in a national database. This database should contain:

- Equipment vendor Name and Address
- Email address technical contact at equipment vendor
- Model Number, Serial Number, and Date of Manufacturer
- Modulation Method, frequency bands actually in use
- Date placed in service, Latitude and Longitude of installation location
- Name of ISP, administrative email address, technical contact email address
- Date of last update of the database entry

¹ IEEE-SA AND IEEE POWER ENGINEERING SOCIETY TO HOLD MEETING ON BROADBAND OVER POWER LINES Call For Interest Meeting 7 June 2004, Denver, Colorado USA

This information will not be burdensome for an Access BPL provider to register, as the information is needed internally to manage the network and account of assets.

The information must be electronically searchable, 24/7, with an availability of 99.98%, via internet access. Search should be on a individual field basis. It's acceptable to request information from the person searching the database.

Registration of equipment must occur prior to activation.

The FCC should consider allowing the database to be made available in bulk such that non-industry entities can provide modified search capabilities.

While some might claim that providing this information in such a public forum has security and anti-competitive issues, the FCC should consider that any normal HF monitoring radio will be able to determine the location of equipment. Coupled with a GPS receiver, anyone could construct such a database.

The need for such a database is clear – with the existing trials, several Amateur Radio operators have reported interference. The HF frequencies frequently have many source of noise and interference. Less effort will be expended in identifying the source of interference and having it eliminated if this type of information is known about deployed BPL systems.

Noise is often very local, hard to track down, and determine the source of the noise.

V. Hi-Gain antenna's and local power lines.

The FCC suggests that orienteering hi-gain antenna's in a direction such that interference is reduced or eliminated is sufficient to solve any potential interference problems that occur with Access BPL systems, and that this practice is already used due to interference from power lines.

This is incorrect.

Power lines, which are correctly installed, maintained are not a source of interference to HF reception. Power lines are often sources of sparking noise (and sometimes corona discharge) that indicates a defect in the line, or the hardware and should be repaired. The FCC even has rules requiring this.

At my licensed Amateur Radio Service station, I have power lines that run the length of the back of the property line (longitudinally N-S), and power lines running East-West along the street leading to the station property. If an access BPL system were deployed on both lines, then I would have two cones of 22.5 degrees each that I would be able to orient my station antenna to avoid BPL induced interference – that a loss of 87.5% of currently available paths to other stations.

At one previous location for my station, I experienced severe sparking noise. It was identified as coming from a power line, approximately 1/8th of a mile away. The power company reported the insulators were very old, in danger of failure. After completion of repairs, the power lines were no longer a source of noise and I was able to orient my antenna in any direction needed to establish a communications path.

VI. Measurement Techniques

Existing practices for measuring compliance allow for measuring radiated emissions at 3m, and using an extrapolation factor of 40db/decade to figure what the radiated emissions would be at 30m. The commission should examine the work done by the NTIA and Ed Hare, of ARRL. Their analysis and testing indicates this roll off value is too high, and that a value of 20db/decade is more realistic.

Because of the uncertainty of measurements, the FCC should require measurements be taken no closer than 30m, and at a height similar to what power lines will be at during access BPL operation.

VII. Interference Elimination

The FCC should require the access BPL equipment have the capability to notch out bands of operation of receivers that are interfered with. An access BPL operator should be required to notch out frequencies of operation of a licensed station upon reporting BPL interference.

As information in consideration of this NPRM, the FCC should review the interference complaints to Progress energy of Raleigh, NC by KN4AQ and others. From the documentation made available, it's instructive to look at the efforts made and the results achieved.

Further, the Access BPL industry, thru the PLCA has stated that many installations exist and there are no reports of interference. While it's not clear how the PLCA came to know all the reports made to the FCC, and private entities with regards to interference, it's incorrect to assume that because no reports have surfaced yet, that there won't be any cases of interference.

Several possibilities exist – there aren't any active Amateur Radio Service stations in the trial areas at the time the trials are operating; the Access BPL equipment was turned off while interference testing was occurring; and, Amateur Radio Service stations are subject to many forms of interference (and noise) – operators may not have yet come to realize the source of interference they are having is a new BPL trial.

Overall Comments

Access BPL, as a carrier current system, using frequencies below 50Mhz hasn't met the technical challenges of a modern communications system. The equipment makers

haven't provided sufficient testing results to indicate such a system can be deployed without causing harmful interference to licensed stations.

I make the following recommendations:

- Adopt the NPRM proposed, with the modifications noted above.
- Require notching for frequencies on interference report
- Monitor the industry closely
- Look for alternative Access BPL systems that are better engineered, such as that being design by Corridor Systems.

It is possible to design and deploy an effective Access BPL system, but, it hasn't been seen yet.

Respectfully Submitted,

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