Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554
18 August 2003

In the Matter of	)	
Inquiry Regarding Carrier Current	)	
Systems, including Broadband over	)	ET Docket No. 03-104
Power Line Systems	)	

REPLY COMMENTS OF CORTLAND E. RICHMOND, Jr.
to
Comments of Phonex Broadband Corporation, received at the Commission July 7, 2003

These are Reply Comments of Cortland E. Richmond, Jr., to Comments of Phonex Broadband Corporation, in this document referred to as Phonex, in the matter above, dated 7 July 2003.

The writer has been involved in EMC and EMI engineering since 1983, spent 21 years in the United States Army working with airborne and ground communications equipment, and has been an Amateur Radio operator since 1958.

These replies take the form of excerpts from Phonex' original comment, noted as Comment, followed by reply remarks, noted as Reply. A Roman numeral annotates each Comment and Reply. Replies commence below.

I

Comment:
In-House BPL products use house wiring as a communication path rather than as an antenna. Any radiated signal from BPL products are considered unintentional and are not part of the communication process between BPL nodes. Like any electronic communication device, radiated emissions are possible and therefore regulated by the FCC.

In the many years of developing and testing carrier current systems, Phonex believes that any interference from a power line communication product is due to radiated emissions as opposed to conducted emissions.

Reply:
Phonex knows radiated emissions are a problem; Phonex alone among those commenting to this NOI enjoys, if that word may be used, the experience of having caused harmful interference and of having to recall deployed equipment to remedy the complaints.

However, Phonex with its experience appears not to have considered the effect of carrier current devices on radio receivers used in the same dwelling as the BPL devices it and others wish to deploy. One of the normal uses of a residence is the operation of radio receivers, and, operating as they do on power to which a Home-BPL carrier current system would be connected, reception would be made well-nigh impossible. For that reason, the Commission should impose a conducted current limit, as well as a radiated emission limit, on Home-BPL carrier-current equipment.

II

Comment:
Phonex has sold several thousand HomePlug-based BPL products with no complaints of interference. This is likely indicative of other HomePlug devices because HomePlug developed their standard to limit harmful interference while having a functional product. Efforts included working with groups such as the ARRL to limit potential interference within the amateur radio community.

Reply:
This appears true only if one defines complaints very narrowly. That is, if one allows only formal complaints to the Commission to count, then perhaps it might be correct. However, Phonex errs if it says there have not been complaints related to its equipment; a well-publicized and widespread incident of 1999, where Phonex carrier-current equipment was operated on frequencies in the Amateur 80 meter band, resulted in many complaints* from the Amateur Radio community. Phonex did indeed work with the ARRL to limit interference, but it was not potential interference; it was the real thing.

*From an ARRL technical paper:

" A few years ago, Phonex was manufacturing the PX-421 model wireless modem jack. This model used 3.53 MHz as one of its frequencies, near the lower edge of the amateur 80-meter allocation.

These products were purchased in volume by TCI cable (now AT&T/Comcast) and installed by the tens of thousands with TCI's digital cable systems. ARRL, TCI and Phonex received hundreds of reports of harmful interference at as much as S9 +50 dB! "

Calculated Impact of PLC on Stations Operating in the Amateur Service.
Presented at the November 15, 2002, C63 Committee Meeting, Rockville, MD.

III

Comment:
Customer complaints of harmful interference in certain bands will direct In-House BPL developers in choosing the frequencies that should be avoided. The successful In-House BPL standards will be those that are sensitive to licensed radio users. It is recommended that the FCC not define BPL frequencies but allow this technology to properly and innovatively grow without undue constraints. Since FCC Rules are already in place, market forces, which include the avoidance of customer complaints, must be the driving force for In-House BPL development.

Reply:
The Rules should forestall problems, as well as identify them after they occur. Waiting for complaints to write Rules is like waiting for an epidemic to practice sanitation. It works – but at a cost. BPL systems should be sensitive not only to licensed users, that is, those who transmit as well as receive, but also to consumers whose reception, which does not require a license, is threatened.

Market forces are not always benign. The prime example of that is consumption of habit-forming substances, which is driven entirely by market forces. Should an offering prove seductive enough, avoidance of ill consequences will take a very distant back seat to enjoyment of rewards. Therefore market forces must not become the sole driving force in BPL development.

IV

Comment:
The current FCC Part 15 Rules already specify the radiated limits for carrier current and digital devices. In addition to specifying limits, Section 15.5 of FCC Part 15 Rules specifies that operation of such devices are on the condition that no harmful interference is caused. FCC Part 15 Rules therefore already in place to control interference potential and to legally stop its use when a device is causing harmful interference.

Reply:
As Phonex well knows, compliance with Part 15 requirements can and does still produce complaints requiring termination or modification of operation, and, considering the bandwidth BPL systems propose using, modification or operation to protect consumers and licensed services seems here unlikely to reduce complaints.

V

Comment:
As already stated, any interference from BPL products will mostly be due to radiated emissions. The FCC should therefore not consider adding a conducted limit to the rules as there is no current research that supports a correct correlation between conducted limits and radiated limits

Reply:
Conducted emissions will in fact be a major contributor of interference to residential tabletop and portable receivers. Additionally, radiated emission configurations not being well defined, a prudent limitation must be accepted for conducted emissions pf BPL carrier-current devices.

VI

Comment:
Since In-House BPL technology is new, it is important that the FCC take a light-handed approach to changing existing rules. This will allow confidence and innovation in new development of In-House BPL products and standards.

Reply:
Since In-House BPL technology is new, the Commission should take note of the inapplicability of existing rules, which have been demonstrated by both calculation and measurements inadequate to allow the Commission to protect consumers and the radio services it licenses.

VII

Comment:
The current three-house method of testing radiated emissions is an acceptable test method. Testing done by Phonex has also illustrated that an open area site test using a turn table with a characterized wiring assembly produces similar results to home testing. Phonex therefore supports the development of a standardized measurement method in an open test site but believes that it should be used as an alternative, and not as a replacement to the current three-house test procedure. The three-house test procedure should be retained since it is already successful and proven to allow BPL to develop.

Reply:
This writer agrees that a standard test method should be developed. However, the variety of structures in which Home-BPL might be deployed argues against allowing manufacturers to specify only three houses; Home-BPL deployed in an apartment sharing a transformer and next door to a short-wave listener's would most assuredly impact his enjoyment of his property more than if deployed in a frame dwelling separated from its neighbor by tens of meters. And in any case, a Home-BPL user's enjoyment of his property should also be protected inside his own dwelling..

VIII

Comment:
Phonex believes that the current Verification process used for all unintentional radiated devices, including carrier current devices, should be retained for In-house BPL devices. Only a small number of In-house BPL standards will be used by manufacturers in their various products. There will therefore not be a large variance in radiated output, between products using the same In-house BPB standard. This is in sharp contrast with the radiated variances that are found in digital devices which also only require Verification.

Reply:
Phonex' reliance upon adherence to nonexistent standards for not-yet-deployed services is misplaced. The writer continues to urge the Commission, for this new technology, to strictly oversee adherence to such regulations as may be adopted.

IX

Comment:
The success of Phonex Broadband Corporation selling power line communication devices is evidence that the FCC should continue to support and allow PBL to prosper. The current FCC rules, test methods and processes have been successful in allowing BPLB to develop and to limit its use in cases of harmful interference. With the FCC rules already successfully in place, Phonex believes the FCC should allow the market place to determine the development of In-House BPL.

Reply:
Phonex' success notwithstanding, it should be noted that it has achieved that success in spite of a nationwide interference problem, only by selecting frequencies not used in areas where its equipment is deployed, and not deploying in so many locations as to bring its installations to the notice of spectrum users who might be interfered with. The success of BPL, however, is predicated on being installed wherever there is power, and on using an extremely wide range of frequencies. Under these circumstances, interference will almost certainly become a problem, and, this time, with no alternative to removal of the interfering device.

The Commission should not grant market forces sole authority over services it regulates. It has a responsibility to those who use the spectrum BPL threatens at least as great as its responsibility to innovators seeking commercial success for their inventions.

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The writer desiring that the Commission examine Phonex' comments with the above in mind, these remarks are respectfully submitted,

Cortland E. Richmond, Jr., KA5S

18 August 2003