

8 August 2003
Federal Communications Commission
Washington, D.C.

REPLY COMMENTS: FCC Notice of Inquiry ET Docket 03-104

Dear Commissioners:

I am writing to reply to comments made to the Federal Communications Commission May 23, 2003 Notice of Inquiry, ET Docket 03-104, and to express my strong opposition to the introduction of Broadband over Power Line (so-called "BPL" systems,) a form of Power Line Carrier (PLC) technology, into the United States. Broadband over Power Line (BPL,) if widely introduced to the U.S. market for network access, would have a devastating impact on existing national critical communications infrastructure. Its use of frequencies from 2 MHz to 80 MHz to transmit digital data over existing power lines would result in spectrum pollution the likes of which no industrialized nation has ever tolerated, posing a distinct and real danger to national security and our quality of life.

I am a technical and scientific professional in the computer networking industry, with a bachelor of arts from Dartmouth College and a Masters of Science in Computer Science from the University of Texas at Austin. I am also a federally-licensed radio operator, with direct experience providing emergency communications in times of severe flooding using HF frequencies. I will be directly affected by the outcome of the FCC proceedings.

NATIONAL SECURITY

The short wave frequency spectrum (from 2 MHz to 30 MHz) is one of the most crowded and heavily used portions of the radio spectrum because signals at those frequencies can travel such great distances across countries and continents. The spectrum is used not just by short wave broadcast stations like the Voice of America, Radio Liberty, the BBC, and Radio Australia, but by many other services as well. Ocean-going vessels rely upon short wave communications. Standard time and frequency transmissions are made on short wave. The aircraft navigation and communications network relies in part on short wave frequencies. The U.S. military relies upon short wave communications, as do several Federal Emergency Management Agency operations including the Mobile Emergency Response System (MERS), FEMA National Radio System (FNARS), and the State Area Command (STARC) network, all of which responded following the September 11, 2001 terrorist attacks. The Amateur Radio Service also relies on short wave spectrum frequencies to provide emergency communications during natural and civil disasters. Even now, Amateur Service stations are involved in combatting massive wild fires in Montana, and the Amateur Service was recently granted use of additional short wave frequencies by the FCC specifically to support better emergency communications with stations in the U.S. Caribbean territories and possessions.

If this country gets into a war with a major power, our satellite communications systems will be a huge target - our recent military success in Operation Iraqi Freedom must surely underline the importance of satellite

communications as a military asset. If those assets are destroyed in conflict, short wave communications capabilities would become even more vital than they are today. With short wave radio, there are no satellites or repeaters or intermediate weak links in the communications network to fail. This is one of the reasons why the U.S. military and the Federal Emergency Management Agency continue to value the short wave spectrum, and it is one of the reasons why the Amateur Radio Service continues to provide such excellent communications response to hurricanes, tornadoes, wild fires, earthquakes, and terrorist attacks. A hurricane can flood 911 emergency call centers, a terrorist attack can damage internet exchanges, cell towers, and fiber optic lines, and a war could result in destroyed satellites and undersea cables. Short wave communications can fill the gaps, but to do so, we need to ensure that the short wave spectrum isn't polluted with interference and rendered unusable. Broadband over Power Line threatens this vital national emergency resource.

INTERFERENCE

Preventing interference is an important area all computer and appliance manufacturers must focus on to sell products in this country under existing Federal Communications Commission (FCC) regulations. I own a digital camera that came with a ferrite choke built into the camera's data cable to suppress radio frequency interference (RFI) from the camera to other devices. This sort of remedy for potential RFI problems is common - millions of digital cameras are sold every year with data cables just like this - and it is essential to prevent or limit interference to short wave radio usage.

Given the vital importance of short wave communications today and the potentially even more important needs in the event of war, terrorist attack, or natural disaster, it is not surprising that the computer industry is required to take strong steps to prevent interference. It seems remarkable that a proposal would be made to broadcast high speed digital information over unshielded power lines where interference is a certainty. By its nature, high speed information has high frequency components that will easily radiate - hence the need for that ferrite choke on digital camera data transfer cables. But imagine using long overhead wires that will act as antennas to transmit such information! This will not be a localized interference phenomenon. Amateur Service stations routinely communicate with other stations thousands of miles away using just milliwatts of power. The interference that BPL will generate and propagate over the short wave spectrum will cause a huge aggregate increase in noise pollution in addition to localized severe interference.

Ambient Corporation, and others have argued in comments to the Notice of Inquiry ET Docket 03-104 that BPL service providers and equipment manufacturers will be capable, someday, in the future, maybe, to mitigate radio frequency interference from their BPL systems. In the mean time, existings test of systems such as theirs, operating under Special Temporary Authorities (STA) to existing Part 15 regulations, already greatly pollute the short wave spectrum. I support the conclusions of the American Radio Relay League (ARRL) as expressed in their 120-page response to the May 23, 2003 Notice of Inquiry ET Docket 03-104, and the opposition of many others (including the North American Shortwave Association, the Amherst Alliance, National Academy of Sciences, the AMSAT Corporation, REC Networks, AMRAD, Aura Communications, GE Medical Systems, the National Association of Broadcasters, the Association for Maximum Service Television, the National

Association of Shortwave Broadcasters, and countless others) that Broadband over Power Line (BPL) systems will generate level of spectral pollution and radio frequency interference that are simply intolerable. The ARRL has conducted field tests demonstrating strong interference to short wave signals in current BPL trials. This is not merely "speculation" or "exaggeration" of interference that Ameren Energy Corporation and the Information Technology Industry Council argue in their comments filings to Docket 03-104. It is indeed remarkable that Progress Energy has the gall to state "There have been no reported instances of interference during the extensive field trials performed thus far..." in their comments to the Notice of Inquiry, when all one has to do is drive down the street with an off-the-shelf consumer shortwave receiver and a small vehicle-mounted antenna to hear entire bands of radio frequencies rendered unusable, as the ARRL has demonstrated. Even in very small trials of ten or fewer customers, the levels of interference from BPL have proven to be intolerable. These ARRL field test results dramatically show the problems with BPL conclusively, and clearly demonstrate that any further steps towards widespread acceptance of BPL systems would be catastrophic!

All of the vital services in the national communications infrastructure demand protection from spectral pollution and interference. The computer and computer networking industry have always been required to prevent interference and to resolve it if it ever arises. The proposal for Broadband over Power Lines (BPL) threatens to dramatically change that, as the BPL systems tested to date have all demonstrated unbelievable levels of spectral pollution, radio frequency interference, that would necessarily damage vital communications systems. It is no wonder that such systems have already been rejected by regulatory authorities in both Japan and Germany on these grounds.

RURAL SERVICE BAIT AND SWITCH

So what would the proponents of Broadband over Power Line (BPL) offer in exchange for their trashing of the short wave spectrum? The most common argument I've encountered is the delivery of high speed data service to rural customers (the "universal access" argument supported by lobbying groups and companies like the American Public Power Association, Satus, Inc., Cinergy, Current Technologies, the Alliance for Public Technology, and others in comments to the Notice of Inquiry ET Docket 03-104.) BPL proponents argue that BPL could offer service to those who are beyond the current reach of Digital Subscriber Line (DSL) or Cable Television (CATV) systems. Almost everyone has power cables going to their home, so the (incorrect) assumption is that BPL offers an easy broadband solution for rural customers (seemingly) without other options.

Unfortunately, the economics of this just do not work out. Customers can be hooked up with DSL out to about 16,000 feet (a little over three miles) from a central office. BPL will probably only go 2,000 feet (not even 2/5 of a mile) from the BPL equivalent of a central office before it needs an expensive device that amplifies the signal installed by a linesman trained to work with 11,000 volt overhead lines. This means that for a customer 16,000 feet away, no fewer than eight BPL repeaters devices might be needed. Not only that, but at the customer's pole transformer, and possibly at other pole transformers on the way, a bridge needs to be installed to couple the signals from the high voltage lines down to the lower voltage lines eventually to the dwelling. These bridges must be installed by a linesman trained to work with extremely high voltage lines. To hook up a single customer, a BPL

service provider might need to install eight or more repeaters, possibly several transformer bridges, and have it all done by employees who can rightfully expect a substantially higher paycheck for more difficult, dangerous, time-consuming, and skilled work than the DSL installer who simply plugs a DSL modem into a phone jack.

However the math is worked, there is no way that BPL service providers can install such a vast array of expensive equipment with expensive labor costs in rural areas with any hope of meeting the projected pricing. It certainly cannot be done for less than what it would cost to install 802.11 wireless access points on existing wireless transmission facilities (the best answer to rural broadband access.) BPL service providers will instead concentrate on high-density urban and suburban areas, just as DSL and cable modem service providers already do, and for the same economic reasons. In exchange for destroying the effectiveness of vital short wave communications networks and services, Broadband over Power Line offers nothing new to the American consumer that the DSL, CATV, satellite, and 802.11 wireless service providers do not already offer.

CONCLUSION

Broadband over Power Lines (BPL) is a grave, undeniable threat to the future use of short wave communications frequencies. As the American Radio Relay League has proven, the levels of spectral pollution and radio frequency interference generated by such systems are simply intolerable. The North American Shortwave Association commented to the Notice of Inquiry with "Access BPL and In-House BPL devices using HF frequencies are incompatible with international broadcast reception in the International Telecommunications Union (ITU)-allocated spectrum between 2 and 26 MHz." BPL is simply incompatible with all existing services in the short wave spectrum. We cannot allow critical emergency, military, and national security communications systems to be damaged in this way. The Federal Communications Commission (FCC) has a duty and an obligation to the citizens of this country to protect the spectrum that is our common resource. To allow one industrial sector to so damage and pollute the indispensable short wave spectrum would be reprehensible, and the FCC has an obligation to prevent it from going any further. The FCC should immediately cease any further development of regulations to allow the development of Broadband over Power Lines (BPL.)

Thank you for your consideration,

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