To: Federal Communication Commission

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Subject: Comments on ET Docket No. 03-104 and ET Docket No. 04-37

I am an Amateur Radio Operator. I am formally educated as an Electrical Engineer so I know something about Radio Frequency (RF) radiation and antennas in an academic sense. I am trained as an Emergency Communications person. I am a current user of broadband services. Like most Amateur Radio Operators (hams), I appreciate broadband services not only in support of my radio activities but in countless other pursuits. Thus, allow me to put to rest the claims by Wall Street Journal and other less informed reporters that the Amateur Radio community consists merely of obstructionist "old folks trying to make contacts with all of the counties in the United States". Such posturing in support of big business interests deserves no more comment than that in this forum. While not widely reported outside the ham community, following hurricanes, tornadoes, floods, and yes, even September 11, 2001 Amateur Radio "is more" and "does more" for American Society than many realize. Therefore, please accept the comments below as coming from one who is deeply concerned that the apparent rush to adopt Broadband Over Power Lines (BPL) warrants some "fixing" if ALL users of the high frequency (HF) radio spectrum are going to continue to enjoy use of their frequencies without harmful interference. My comments below consist of relevant background on the Amateur Radio Service related to the issues of BPL and of refutation of assertions made both by third parties and within the "Notice of Proposed Rule Making, ET Docket No. 03-104 and ET Docket No. 04-37" (The NPRM) that are either questionable or inaccurate. Following my comments, I suggest some remedies that I urge the Commission give due consideration.

Relevant Background

The bases for the Amateur Radio Service as defined in Section 97.1 of the FCC Rules are:
(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communications service, particularly with respect to providing emergency communications .
(b) Continual and extension of the amateur's proven ability to contribute to the advancement of the radio art.
(c) Encouragement and improvment of the amateur service through rules which provide for advancing skills in both the communication an technical phases of the art.
(d) Expansion of the existing reservior within the amateur radio service of trained operators, technicians and electronics experts.
(e) Continuation and extension of the amateur's unique ability to enhance international goodwill.

Compared to broadcasting services which have effective radiated

power on orders of thousands of watts, most hams have effective radiated power levels well under 1000 watts. Some, called QRPers, operate transmitters with average output power of less than 1 watt for the challenge. As such, hams can be classed as a "small signal" service. In receiving domestic or international signals, the levels are tiny and in many cases at or near the noise level. Therefore, any sources of interference which block reception of these signals are "harmful" interference to a licensee of this service. In situations such as hurricane tracking/relief activities, "harmful" may even be extended to "life-threatening".

One of the benefits of "small signal" reception is that many foreign hams meet their only "Americans" via the ham bands. Here is where the person-to-person communication takes place that allows people of different nations to realize that for most of the earth's people "pursuit of happiness" is a prime goal despite what claims they may hear reported by others with different political agendas.

Hams have been and continue to be at the forefront of RF technology. Many of those working in industry in jobs related to radio technologies are hams. One of the leading research groups in spread spectrum techology--spread spectrum technologies are being used by the BPL producers--has been the non-profit ham organization, TAPR. Hams have been leaders in packet radio technologies and microwave technologies. And, what private group has managed through its own resources to have communication satellites placed in orbit? Hams, of course.

Why remind the FCC of this? First, all should understand--especially some of the news reporters-- that the word Amateur used in describing the Amateur Radio Service does not imply less profiency in our endeavors, as it might in athletics, but rather that we enjoy radio as an avocation--without compensation. That is, we're not "in it for the money". Second, that some very brilliant minds who are working in the labs of industry to bring us the likes of WI-FI, cellular and other radio technologies are also hams, are generally proponents of technology, but are fearful that with insufficient controls, BPL will have a deleterious effect on many HF services far beyond what the FCC commissioners have been led to believe by BPL proponents.

Refutation of Assertions

Making and refuting assertions is problematic at best and a boondoggle at its worst. In the NPRM docket others have been identified as having made some assertions without proof or even logic, and I feel it is appropriate to refute the assertions.

In Paragraph 11, BPL proponents argue that Access BPL will improve the competitiveness of the market. I assert that BPL pricing by a for-profit enterprise will at best be less than 10% below that of existing broadband carriers. How can I make that assertion? In communities where a monopolistic situation existed (cable with no DSL or DSL with no cable) and a second carrier came into play, pricing has been nearly identical. I expect little change with an oligopolistic situation with three instead of two carriers. Yet, the arrival of BPL poses the spectre of great damage to the radio

spectrum use. Today, a cable carrier with a leaky coaxial system is ordered to fix it immediately, and the interference is easily "sniffed out" with RF detectors. DSL technology uses twisted pair which reverses the RF induction every twist, thus cancelling it.

In Paragraph 12 and repeated in Paragraph 30 of the Discussion section, undisclosed parties state the "ubiquitous nature of the power grid will make it possible for Access BPL systems to bring broadband services to rural and other underserved locations." I understand that President Bush has as a high priority to provide broadband to all households, and I understand the desire of the Commissioners to satisfy their chief executive. Yet the economics of how BPL is deployed indicate that implying a ubiquitous power grid is synonomous with "universal broadband service" is only being used as a rallying cry by BPL proponents. In reality, delivery of signals to an Access BPL locale will likely be provided by fiber optics or other transmission media. And Access BPL equipment will be cost justified only if revenues make it so. So, I challenge the BPL proponents to answer if they will be installing BPL access services to a ranch at the end of a dirt road 50 miles from Butte, Montana with only one house on it because it has an electrical drop at the house. I believe the answer, in reality, is a resounding "No", and we're right back to where we started, except we now have BPL sullying the airwaves.

In Paragraph 13, BPL proponents state it will improve homeland security. There is a parody here. The FCC denied the Amateur Radio Service a sliver of a radio band at very low power levels because the energy companies claimed Amateur transmitted power levels might disrupt power line carrier (PLC) services used to provide telemetry services needed to control the power grid. Now the BPL proponents using BPL are claiming that they will stake the Nation's homeland security on a non-primary service which may be interfered with by licensed services and must shut down if it is interfering with others. That does not appear to be a banner worthy of waving.

In Paragraphs 14 and 16 is some discussion of the concerns posed about BPL by ARRL and NTIA. While not a party to any presentations made by ARRL to the FCC, my sense as a U.S. citizen is that the voice of the ARRL has been viewed as that of "amateurs". This I find unfortunate for the reasons cited above in the Background section. Yet recently, I have read the report of the NTIA which suggests, "Interference to...fixed stations receiving moderate-to-strong radio signals is likely in areas extending...230 meters from one BPL device and the power lines to which it is connected". (This is not buried deep in the NTIA report, but rather is in the sixth paragraph of the Executive Summary.) I know of few urban, suburban, or even rural areas where the served abode is more than 230 meters from the utilities distribution power sources. And, the NTIA is a governmental agency!

In Paragraph 19, Telecommunications for the Deaf, Inc. weighs in. I have two friends who were legally deaf but can now hear because of cochlear implants. They made extensive use of teletype services to "stay connected" before their implants. Yet, at least one has had to move to a different house because of broadcast radio signals being picked up 24 hours a day by her recent implant. She is now

concerned that she may have a BPL signal in the duplex electrical outlet near the headboard of her bed and that walks in the city will be complete with the buzzes and "geiger counter" clicks characteristic of BPL signals on open wire lines. More than hams are affected by RF sources.

In Paragraph 20, BPL equipment manufacturers claim there have been no complaints of interference. Therefore, they can't be interfering. Ahem, that claim doesn't even pass the "snicker test". In most cases, tests are unannounced. A ham wakes up one morning, turns on his receiver and the signal strength meter is hovering at S-7--not a coherent signal, merely noise. As I recall, when the ARRL was known to be doing some testing in the Baltimore in the Spring of 2003, the BPL provider quiesced its system for "adjustments". What do hams have to deal with already? An insulator on a high voltage transmission line gets a crack in it, a little dirt and then we get a noise source that may carry for hundreds of feet. The ham may have a responsive power company with a radio frequency interference unit, but he may have to find it himself. Then, all he need do it to get the power company to schedule a crew to fix the problem, if possible. In my own household, noise spurs every 158kHz on the 50 to 54MHz radio band turned out to be a Part 15 device--a motor controller on our treadmill. And, I know when my neighbor's wife across the street uses her treadmill from 6:45AM to 7:00AM each morning--also, I suppose, a Part 15 device. Do I ask her to not exercise because she's interfering with a licensed service? Certainly not. But, I do not feel anyone needs to tolerate a 24 hour per day noise source hanging from a nearby pole line.

In Paragraph 35 (Access BPL Emission Limits) there is a clear misunderstanding of the amateur radio technology in practical use when the docket states, "We therefore would expect that, in practice, many amateurs already orient their antennas to minimize the reception of emissions from nearby power lines."
That statement is akin to suggesting a golfer make his drive from a tee at right angles to a direction to the hole because there is a water hazard between him and the hole. If a ham has an omnidirectional antenna, it will receive a signal from all directions equally, albeit without gain. Those who choose to use a "gain antenna" (yagi, cubical quad, rhombic, dipole, half-square, four-square, etc.) either orient it in the direction of the desired signal if it is fixed or employ a rotator to aim the beam in the direction to receive the maximum signal strength. Those with antenna with a receive gain of 6db will get an earful of BPL signal. Furthermore, when they transmit, low and behold the BPL signal is likely to be interrupted by the effective radiated power of the ham. I can hear the screams of the BPL broadband user even now that the ham is "at fault".

Proposed Remedies

This author would be remiss to merely offer complaints without offering some remedies. To that end, I suggest the following:

1. This NPRM seems to set a precendent wherein the burden of proof is on the licensee to prove that he is being interfered with. Hams already are dealing with International fishing vessels, unlicensed

truckers, CB operators, and spurious noise sources from powerline equipment. I believe the Commission must use new information from NTIA, ARRL and its own technical resources to set standards for BPL services that ensure it is minimally interfering, and then ensure BPL equipment goes through a certification process BEFORE being allowed to deploy.

2. Based on the legal spokesman of at least one North Carolina based electrical utility near Raleigh recently, a more specific statement of "harmful interference" needs to be embraced for BPL. The referenced spokesman stated that "according to FCC rules" he didn't think his company's early deployment provided "harmful interference". With reference to my statement above that the Amateur Radio Service is predominantly a "small signal" service, then perhaps the test can be as simple, "If any given station can hear the desired station without BPL operating but can't hear it with BPL opearating, then the interference is HARMFUL." Legal counsel shouldn't have too much to debate with that as a criterion. The Commission needs to be sure the legal definition of "harmful interference" is sufficient to avoid becoming a political football.

3. Amateur radio service operators are frequency agile. We are permitted to operate in 8 bands as unchannelized receivers/transmitters of RF energy. Our widest band covers 1.7 Megahertz of bandwidth. Others range from 50 kilohertz to 450 kilohertz. BPL operators claim that they can "notch out" interfering frequecies, yet there is no assertion that they can or will do it quickly nor that once identified they will permanently "notch out" that frequency in that operating segment of their system. Also, it is not clear, and is even more uncertain based on the NTIA study, that segments using different spread spectrum frequencies in adjacent segments might also need to be "notched". I believe that is why the ARRL was so adamant about avoiding Amateur frequencies altogether. What is still unknown is whether BPL system signals will propagate from hundreds of miles away and be interfering. In this latter case, it will not even be clear who must be contacted to remove the interference. I request that the Commission expand the rulemaking to provide quick and PERMANENT relief from identified intererence. Since BPL will be significant "radiators" of RF energy, perhaps an "RF signature" should be required or each carrier to permit pinpointing the source of the received interference.

Thank you for your attention in the matter.

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