



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

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**RE: Interference Complaint, Municipal Broadband  
Over Power Line System at Manassas, Virginia;  
Objections to COMTek Interference Report  
Dated July 25, 2006.**

Greetings:

This letter responds to that of Tony S. Lee, Esquire, counsel for Communication Technologies, Inc. (COMTek), dated July 25, 2006. That letter, with attachments, apparently constituted the response of COMTek to the June 16, 2006 letter from the Enforcement Bureau requiring COMTek and the City of Manassas to address numerous pending complaints of harmful interference to licensed Amateur Radio stations in Manassas, Virginia caused by unlawful operation of the Access Broadband over Power Line (BPL) system there. ARRL, the National Association for Amateur Radio, also known as the American Radio Relay League, Incorporated (ARRL), has had an opportunity to review this report and the attached exhibits A and B, and finds the report flawed in numerous respects. ARRL objects to the report, because it is based on improper

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engineering practice and contrary to the instructions provided by your office in your letter dated June 16, 2006. It is our contention, and that of Messr's Tarnovsky, Blasdell, South and Whittum, that the Manassas BPL system continues to cause harmful interference to Amateur Radio operations; it did so both before and after the tests conducted by COMTek; and there is no doubt at all that the interference is from the COMTek BPL system operated in the City of Manassas, and not from any other source. ARRL reiterates that this system should be shut down immediately. Unless the Enforcement Bureau is willing to do that, you are going to have to send Commission staff to observe this interference and conduct their own measurements in the presence of both COMTek and the local Amateur Radio operators who are receiving the interference. COMTek has filed incorrect and misleading reports concerning this matter, and they have manipulated the BPL system to show false readings.<sup>1</sup>

ARRL objects to the procedure employed by COMTek and the City in conducting the tests that led to this flawed report, and the failure to coordinate the test procedure with the local radio amateurs in advance, or even to conduct the tests addressing the Tarnovsky/Blasdell/South/Whittum interference complaints in their presence.

### **I. The "Agnew Complaint" Testing.**

You are in receipt of a letter from Mr. Tarnovsky dated July 17, 2006 addressed to Mr. Marsilii, the Director of the Customer Engineering Group of Main.net, which manufacturers the modems used in the Manassas BPL system. Mr. Tarnovsky made reference in that letter to the testing of the areas mentioned in the Agnew complaint on July 14, 2006. During the July 14, 2006 tests, it was apparent that the unnotched BPL center frequencies (the "barker frequencies") showed little usage. Mr. Tarnovsky inquired whether the system was operating at peak levels, since BPL system-generated interference increases with loading. Main.net responded that the pole mounted modem was transferring data at peak data rates, but it refused to provide system loading data (a histogram of data transfer vs. time). Although it was denied by both the Main.net engineer and COMTek that such a reporting mechanism existed, Mr. Tarnovsky and other amateur radio operators had seen such displayed on a monitor at the Manassas City BPL System Command Center. As well, two years previously at a field survey, the local radio amateurs had seen the same information displayed on a laptop. Another flaw in the test procedures was that testing of the noise levels was not done in the presence of Amateur Radio transmissions which cause packet collisions, after which the BPL system reacts by sending data bursts at considerably higher levels.

Not satisfied with the flat denials of the Main.net testing engineer and Mr. Hewa at the time of the Agnew testing relative to the system loading data that COMTek refused to produce, Mr. Tarnovsky contacted a former Main.net engineer who informed him that the Manassas BPL system does, in fact, have a utility called NMS (Network Management

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<sup>1</sup> For example, on 26 July, 2006, Mr. Blasdell, one of the complainants, monitored the BPL interference levels in the area of Weir and Traveller Streets in Manassas and found that the undesired signal levels in the 40-meter Amateur band were S9 plus 10 dB on his good quality amateur receiver and mobile antenna. This level of interference would preclude virtually all Amateur communications in that band.

System). NMS reports include the histogram, and it is displayed at the Manassas BPL System Command Center. It reports system loading at predetermined intervals, typically every 15 minutes. That information was, requested by, but never provided to any of the Manassas amateurs. Mr. Tarnovsky and others measured the interference the very next day, July 15, 2006, and found that the same BPL area surveyed the day before was again generating interference. The Enforcement Bureau letter required that the system be measured at peak loading. Absent that, the interference levels of the system can never be accurately ascertained. Mr. Tarnovsky requested in his July 17 letter a peak system usage report covering the period May to June 2006, so as to facilitate the timing of the next engineering survey.

Mr. Tarnovsky's letter to Main.net went unanswered. The City of Manassas had apparently retained a consultant, Lee Afflerbach, of Columbia Telecommunications Corp. who claimed in a Memorandum dated July 17, 2006 and submitted to you the same day by the law firm representing the City, that the Agnew testing revealed satisfactory BPL levels at various locations.<sup>2</sup> However, Afflerbach admitted in his Memo that there was not agreement at the July 14 testing whether or not the system was operating at peak loading during the testing, as the Commission required. Mr. Afflerbach stated that "[t]he City, COMTek and Main.net agreed to coordinate testing times at the next testing period in accordance with requests by the amateur radio operators."

## **II. The Tarnovsky/Blasdell/South/Whittum Interference Testing.**

*However, that agreed upon further testing never happened.* Instead, Mr. Tarnovsky and Mr. Blasdell informed your office on July 21, 2006 that, as of that date, there had not been a date specified for the next meeting and survey, and that the testing usually occurs immediately prior to a Commission-imposed due date, which in this case was July 26, 2006. Mr. Tarnovsky asked, in view of the lack of any contact from anyone associated with the City or COMTek about the to-be-agreed-upon testing procedure and schedule, whether the interference tests could be postponed, since he and Mr. Blasdell each had to be out of town during the week of July 26, 2006. Ms. Power responded (ARRL suggests arbitrarily), that the testing could not be postponed absent a request by COMTek and the City of Manassas, which was not forthcoming.

The next occurrence was the filing on July 25, 2006 by Tony S. Lee, Esquire of the COMTek response to the June 16, 2006 letter of the Commission. There was no involvement by the complainants in this process. Nor did the report address BPL interference in the areas complained of by Mr. Tarnovsky and others. Despite the

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<sup>2</sup> There are numerous factual inaccuracies in the Lee correspondence to you dated July 25, as there was in Mr. Lee's July 17 filing. Among these is the allegation by Mr. Lee at page 3 of the July 17 filing that Mr. Agnew, at the time of the Agnew testing, had stated that the BPL equipment "did not cause harmful interference." The Agnew testing was done in the presence of others. Mr. Agnew never made any such statement. By contrast, the October 17, 2005 edition of Federal Computer Week contains an article by Dibya Sarkar entitled "Broadband interference; internet over power lines may jam airwaves, but remedies exist". That article includes the following quote from COMTek Vice President Walt Adams: "It's not a question of whether BPL interferes with ham radio. It does." This admission was repeated at numerous meetings between COMTek and Manassas radio amateurs. It is beyond dispute.

optimistic, and virtually unsupported assessment of Mr. Lee that “all is well” with the Manassas BPL system now, the report raises far more questions than it answers. It is unclear why, if COMtek retained an “independent laboratory” to conduct the tests it allegedly made in connection with the Agnew complaint, that same laboratory was not apparently retained to conduct any of the tests relative to the Tarnovsky/Blasdell/South/Whittum (TBSW) complaints. Instead, Main.net did the latter tests, not in the presence of the complainants, and under allegedly “simulated” peak traffic conditions. The test procedure was flawed. It is akin to a bench test of a single modem, rather than a field test of the system in normal operating mode.

There was no mistake or misunderstanding, as Mr. Lee suggests, about the peak loading statistics that were requested during the Agnew complaint testing. There were numerous witnesses to the discussions about what the system was capable of and what it was not. Those witnesses can easily be produced. The point is that it was never established that the system was at peak loading at the time of the Agnew tests, and it is unclear from Mr. Lee’s attempt at an engineering report what the circumstances were with respect to the sites of the interference complaints of Tarnovsky, et al. Nor was there any mistake as to what noise the complainants heard: it was definitely BPL noise from the Main.net system, which has a very distinctive sound well-known to Messr’s Tarnovsky et al.

Comtek and Main.net apparently adjusted the power levels down for the testing, as the noise was approximately 6 dB from that exhibited when the Power Level 5 was in use in the past. That was demonstrated by the fact that Mr. Tarnovsky, et al. reported that the noise level in the un-notched spectrum was generally low. There are two possibilities: either the data rate was low, or else the power level had been reduced for the testing.

The PSE test report submitted by COMTek indicates that PSE tested at various distances along the line, but not at all distances along the line. The reason for the holes is not explained in the report, other than to suggest that some areas were, without any specific explanation, not accessible. They also have not provided any representative spectrum graphs that would normally be used to help segregate ambient signals, such as strong High Frequency licensed stations, from the measured noise.

In the measurements made around pad-mounted transformers, COMTek mixed measurements taken at 10 meters distances with measurements taken at 3-meters distances. From the data, it appears that they did so for measurements at higher levels, which appears to be an attempt to justify the use of a 40 dB/decade extrapolation. They also claimed that they did so to avoid "ambient signals" without any specific information included to describe that alleged ambient noise. The unamplified loop antenna they used almost certainly results in the "ambient noise" being influenced by the noise floor of their test equipment, drawing all of the measurements into question.

The letter and exhibits raise almost as many questions as we do. The licensees report that the noise level before and after the tests were higher than the day the signals were tested. This is not explained in any conclusive way, and represents the major

disagreement between the radio amateurs and COMTek. Mr. Lee's attempt to explain this by claiming that the noise is caused by something else fails. It is equally unexplained why this noise is never present during formal testing. ARRL staff have personally listened to G1 Main.net BPL being operated on the Rochester, MN BPL system (now turned off) and it produces a very distinctive sound that would instantly be recognized by any experienced Amateur, such as Mr. Tarnovsky and others in Manassas as the sound of a digital signal. The premise that the system was being operated at full speed is not supported by anything more than COMTek's assurance that it was so, and not by any statements by COMTEK or Lee, COMTek's own agent. This matter is completely unresolved and it would be arbitrary and premature for the Commission to reach any conclusion on the basis of this uncertain, undocumented, incomplete and contested matter. Instead, the Commission is going to have to investigate this matter itself, without advance notice to COMTek or the City, so that the system is not powered down or otherwise manipulated to show other than peak loading characteristics at the power levels typically used in Manassas.

COMTek is claiming that the fact that the system was "off" proves that any noise is not caused by them. This in no way addresses what ARRL has noted in previous responses: that BPL signals travel down the power line; unless every node within at least a half mile was turned off and depowered, in no way can it be claimed that the "system" was off. As has been seen in numerous other installations, BPL modems can and do make noise when not being used, but still powered on. In the case of Main.net, the framing (internal housekeeping signals used by the modems talking to each other) occurs about once every second, and in the aggregate, forms the "geiger-counter" sound characteristic of interference from the Main.net system. The system must be tested at peak times in its normal operating state, not in any sort of "simulation".

COMTek also does not support its claim that the noise that mysteriously appears when they are not testing but is absent when they are testing is not correlated with any technical testing of the nature of that noise. A simple time-domain test would easily identify this noise as being different than the known BPL signature, yet with all of the test equipment and expertise allegedly on site, this was not done. This "something else" interference appears only within the City of Manassas. No attempt was made to identify it or to use the equipment and expertise to locate it. If Main.net or COMTek is to be heard to pass off interference as being other than its own BPL signal, it is incumbent on them to determine what it is. This would have been possible had the complainants been involved in the testing.

It is also an anomaly that the interference noise starts at 3 MHz, though the BPL system operates at and above 4 MHz. This, too, was entirely unexplained, and insufficient spectral graphs were provided to show that the system is indeed operating only above 4 MHz. Additional testing is necessary.

It is clear that the Commission cannot rely on reports from consultants retained by the operator of the system causing the interference, while excluding the interference victims. It is obvious that COMTek and Main.net have done testing in various ways each

time they go to the system. Their findings are not in agreement with each other. It should be obvious that any finding under these circumstances is premature and requires corroboration by Commission field personnel.

### **III. 20 dB of attenuation below Part 15 levels is not sufficient to preclude interference to Amateur Radio from BPL systems at HF.**

ARRL continues to take strong exception to the claim of COMTek that 20 dB of reduction below FCC Part 15 emissions levels is enough to protect licensed radio services. ARRL's previous responses included a graph of the median values of man-made noise in residential environments outlined in ITU-R standard P.372-8. At 10-meters distance, the FCC emissions limit over HF is 48.6 dB. (This is a typical distance of a mobile Amateur Radio antenna from overhead power lines.) This is 40 to 50 dB greater than the median noise levels in P372-8. With the 20 dB reduction, this still leaves 20 to 30 dB of noise degradation. The premise that 20 to 30 dB of noise degradation is somehow not harmful interference is, in the case of Amateur Radio, flawed on its face. ITU standards setting discussions include I/N ratios of -20 dB. Although that is arguable, it is clear that by any standard, I/N ratios of +20 to +30 would simply not be acceptable in any venue. ARRL's position is that an I/N of -6 dB is the minimum necessary protection level. This cannot be based on emission levels, but on the ambient noise in the environment at the time.

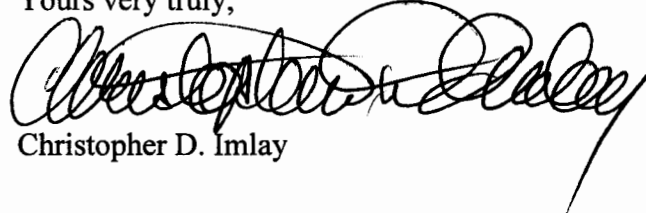
### **IV. Conclusion**

According to Section 15.615(d) of the Commission's Rules, a BPL operator, upon being informed of the presence of harmful interference, must investigate the reported interference and resolve confirmed harmful interference. This has to be "*successfully completed*" by the BPL operator "*within a reasonable period according to a mutually acceptable schedule, after the receipt of an interference complaint, in order to avoid protracted disruptions to licensed services.*" This rule has been completely ignored in Manassas. The recent submissions of COMTek and the City has produced no resolution of the interference at all; rather, COMTek and the City have shown a complete inability and now, by their denials, the unwillingness, to resolve the interference.

On June 20, 2006, the Manassas Journal Messenger newspaper reported on the Commission's correspondence ordering the City and COMTek to resolve the interference complained of by Mr. Agnew and to address the complaints by Mr. Tarnovsky et al. In Response to those letters, COMTek spokesperson Scott Stapf said that COMTek is in the middle of upgrading 600 overhead lines, a move he said was "on schedule to be completed by the end of this year." This is not only inconsistent with the glowing report of Mr. Lee, but it is completely inconsistent with the Commission's instructions to the City and to COMTek. It is also inconsistent with Section 15.615(d) of the Commission's Rules, which BPL companies, including COMTek, are ignoring in droves.

ARRL again requests that the BPL facility at Manassas, Virginia be instructed to shut down immediately; and that it not resume operation unless the entire facility is shown to be in full compliance with Commission rules regarding radiated emissions; with the non-interference requirement of Section 15.5 of the Commission's Rules; and not in any case until thirty days subsequent to full compliance with Section 15.615(a) and (d) of the Commission's Rules.

Yours very truly,

A handwritten signature in black ink, appearing to read "Christopher D. Imlay", written in a cursive style.

Christopher D. Imlay

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