Federal Communications Commission
Washington DC 20554

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

COMMENTS OF Phonex Broadband Corporation (supplemental)

Introduction

Phonex Broadband Corporation (hereafter called Phonex) has submitted earlier comments as part of the FCC's NOI regarding BPL. These following supplemental comments by Phonex are to respond to comments submitted by Aeronautical Radio, Inc. (ARINC).

ARINC specifically mentioned the Phonex Wireless Phone Jack as a possible cause of interference at their Half Moon Bay site.

Discussion

The Wireless Phone Jack is a carrier current device designed to allow the power lines in the home to be used as telephone lines. Although the Wireless Phone Jack transmits over the In-home power lines, it is not a In-home BPL device because it uses a relatively narrow transmit signal compared to the bandwidths used by BPL devices.

Phonex believes that the claims made by ARINC against the Phone Jack are not supported by reasonable data and, to the contrary, there are several reasons to suggest that the Phone Jack could not be the cause of the noise heard as discussed below.

1. The wireless Phone Jack is used for telephone communications. ARINC does not make any mention that telephone conversations could be heard from the signals they were receiving.
2. ARINC was not able to pin point the source of the noise. The Wireless Phone Jack can be found using a directional antenna even in areas that have several Phonex Jacks installed.
3. ARINC states that they measured a signal of -30dBm inside the residential area of Half Moon Bay. They also claim they measured a -85dBm signal about 1.5 miles from the main concentration of homes at Half Moon Bay. They even state interference could be heard five miles away but do not give any details of the levels. However, the Phone Jack was measured by a third part test lab to have a maximum measured signal of -47dBM three meters away from the source while transmitting. This is well below the mysterious -30dBm signal being heard. Also, by using the free-space loss calculations for an isotropic radiator as shown below,

the signal power levels of the Phone Jack can theoretically only produce a measured signal of -97 dBm at a distance of 1.5 miles. The calculation below were made with the assumption that there was a perfect line of sight from the Phone Jack to the receiver (meaning there were no physical barriers such as building, hills or other obstructions) thus calculating the highest possible signal that could be measured. The improbable worst-case calculated signal of -97 dBm is much lower than the -85 dBm signal being measure by ARINC. Real world propagation models suggest much lower levels for a Phone Jack installation.

4. If the noise floor level is typically below -100dBm, as stated by ARINC, then there are several noise sources that could be heard by the receiver. For example, Half Moon Bay is testing a city-wide WI-FI system. The WI-FI system incorporates transceivers installed throughout the city which may be producing measurable signals in the HF band. There are traffic light and street lighting systems that can produce or transmit noise in the HF bands. Phonex is not stating what is actually being heard by ARINC, but Phonex believes other explanations besides the Phone Jack are more likely creating the noise.

Summary

Phonex believes that ARINC made unsubstantiated claims concerning the Phone Jack. Phonex also believes that there is reasonable evidence that shows the Wireless Phone Jack, or any other Carrier Current device that complies with FCC Part 15 Rules, will not produce the interference that ARINC is hearing.

Phonex has always worked with individuals and organizations to solve legitimate cases of interference caused by the Wireless Phone Jack, and we will continue to do so. The current FCC Rules allow for power line communication devices to beneficially operate while at the same time provide safe guards to the users of the radio spectrum.

Phonex technology is sold by several different companies and under several brand names including RCA, Radio Shack, HP, Jasco Products, Belkin, Gemini, EchoStar, Amazon, Smarthome, RiteAid, Target and others. Over ten million units have been sold to the benefit of the users.

As the FCC investigates BPL, they must not change the current rules for narrowband carrier current devices, which have been successfully used for many years.

Respectfully Submitted,

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Phonex Space Loss Calculations

Some simplification of the loss model was required for our calculations.

The following assumptions were made:

The home and the three meter measurement distance around it are considered to be an isotropic radiating source with a spherical radiation pattern.
Although we are transmitting near the ground with a variety of obstacles, we used Free Space Loss calculations to exhibit worst case probability. The results are therefore inflated from possible real world environments.

The transmitted signal is evaluated at 50 Ohms to match the test equipment impedance.

$Zo := 50$ System Impedance

Signal strength of 3.0 MHz signal from Phone Jack measured by a third party test lab.

$Vin\_dBuv := 60$ Voltage in dBuV

Convert from dBuV to Volts and dBm (at given impedance). This provides the measured signal in dBm of the Phone Jack when measured 3 meters from the unit while transmitting.

$V := \left(1 ? 10^{-6}\right) ? 10^{\frac{Vin\_dBuv}{20}}$ $V ? 1 \cdot 10^{-3}$ Voltage in Volts

$Pin\_dBm := 20 ? \log\left[\frac{V}{\sqrt{\frac{Zo}{1000}}}\right]$ $Pin\_dBm ? -46.9897$ Transmitted Power In dBm

Using the given system impedance convert the transmitted signal to watts.

$Pw := \frac{\left(10^{\frac{Pin\_dBm}{10}}\right)}{1000}$ $Pw ? 2 \cdot 10^{-8}$ Power In Watts At System Impedance

Convert a given Radiated Path Length Distance in Miles to Meters

Enter number of miles to convert to meters:
$Miles := 1.5$ $Drpl := Miles ? 1609.344$

$Drpl ? 2.414 \cdot 10^{3}$ Meters

Calculate the wavelength at a given frequency
The wavelength at 3 MHz in meters is:

$? := \frac{3 ? 10^{8}}{3 ? 10^{6}}$

$? ? 100$

We will assume an isotropic receiving antenna.
For an isotropic receiving antenna we have an effective receiving area in m^2 of:

$$Ae\_iso := \frac{?^2}{4 \cdot ?}$$

$Ae\_iso \ ? \ 795.7747$ m^2

The gain of an isotropic antenna is:

$Ga := 1$

The received power for an isotropic antenna will be:

$$P\_received\_iso := Ga \cdot \left(\frac{Pw}{4 \cdot ? \cdot ?Drpl^2} \right) \cdot Ae\_iso$$

$P\_received\_iso \ ? \ 2.1734 \cdot 10^{-13}$ Watts

Convert to dBm:

$$Pdbm\_iso\_received := 20 \cdot \log \left[\frac{\sqrt{P\_received\_iso \cdot Zo}}{\sqrt{\frac{Zo}{1000}}} \right]$$

$Pdbm\_iso\_received \ ? \ -96.6287$

PdBm iso received = -96.6287