Before the

FEDERAL COMMUNICATIONS COMMISSION
Washington, DC. 20554

In the Matter of	**)**	
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Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in the Fixed, Mobile, and Satellite Frequency Bands	**)**	**ET Docket No. 03-237**

To: The Commission

COMMENTS of Nickolaus E. Leggett
N3NL Amateur Radio Operator

The following is a set of comments from Nickolaus E. Leggett, an amateur radio operator (Extra Class licensee – call sign N3NL), inventor (U.S. Patents # 3,280,929 and 3,280,930 and one electronics invention patent application pending), and a certified electronics technician. I also have a Master of Arts degree in Political Science from the Johns Hopkins University (May 1970).

The Interference Temperature Concept

In the interference temperature concept, an individual transceiver or a network of transceivers monitors the ambient radio interference on the frequency band and determines the level of interference present (the interference temperature). Based on this measured interference temperature, the transceiver or network of transceivers adjusts its emitted power and/or frequency.

With the interference temperature approach additional stations could be accommodated on a given frequency band. The maximum number of stations under an

established interference temperature cap would be continuously accommodated over time.

Consequences of Interference Temperature Operations

My comments discuss the unexpected consequences of implementing interference temperature regulations. These consequences will probably modify the actual usage of interference temperature.

A Significant Motive for Using Interference Temperature

One of the primary motives for using an interference temperature system would be to allow numerous additional unlicensed wireless devices into a given radio frequency band. This would be accomplished by setting an interference temperature cap that would raise the existing noise floor in the frequency band.

Determining the Need for Additional Wireless Devices

This motive raises the important question: Are additional frequency allocations needed for unlicensed wireless devices? To date, the Commission has been quite generous in assigning frequencies for such operation. In addition, it has encouraged the development of the new ultra wideband (UWB) technology for similar wireless operation.

The Commission should calculate the number of unlicensed wireless devices that can be accommodated by the current allocations (including usage of ultra wideband technology). If this calculation indicates that the current allocations are ample, then the Commission should be very deliberate and cautious in developing the interference temperature concept.

In calculating the number of wireless devices that can be supported, it should be remembered that most of these devices are very short range meaning that millions of devices can share a given frequency band.

Vulnerabilities of Wireless Devices

Wireless devices are significantly more vulnerable than wired systems. Several types of vulnerabilities exist:

- Security/hacking – wireless systems are significantly more vulnerable to security breaches and hacking attacks. Some of this vulnerability is due to the users' lack of attention to security and to weaknesses in the security protocols. However, much of the vulnerability is due to the fact that the network is operating through free space and unwanted parties can connect to it. There is an activity known as "war driving" where mobile hackers access wireless networks.
- Interference – wireless systems are especially vulnerable to radio frequency (RF) interference from licensed transmitters as well as incidental RF sources.
- Physical damage – wireless systems are vulnerable to physical damage from high power microwave (HPM) and/or electromagnetic pulse (EMP) attacks. Such attacks could easily disable very large numbers of wireless devices.

If the Commission is concerned about these vulnerabilities, it should encourage the use of wire-based local networks instead of wireless networking. The use of fiber optic connections to the desktop would be the best means to avoid these vulnerabilities.

Consequences of a Higher Noise Floor

Many radio users operate in a weak signal environment where the received signal is close to the ambient noise level. Examples of these radio services include:

- Point-to-point communication on the high frequency (HF) bands
- Radio astronomy observations
- Amateur radio
- Citizens band radio
- Low power short wave broadcasting from third-world nations
- Low frequency Part 15 experimentation
- Rural fringe area reception of television and radio broadcasts

All of these activities would be negatively impacted by regulatory actions that raise the noise floor.

Intermittent Operation

The use of interference temperature would lead to intermittent operation as more and more users become active on a specific frequency band. This is a situation where products, such as wireless computer printers, would cease to operate when too many wireless devices were on the air. The products would shut down because the interference temperature is too high. Consumers would not be happy with wireless products that refuse to operate during prime time. The Commission cannot expect that consumers will patiently wait until late at night for their products to resume functioning.

Suggested Actions

The Commission should review its current policy of encouraging endless numbers of unlicensed wireless devices and products. In this regard, the Commission should remember that its most basic duty is to protect the integrity of the spectrum. The public interest would be better served by being skeptical about the need for unlimited wireless devices and being open-minded to other values. Any experiments with interference temperature should be quite cautious and carefully monitored.

Respectfully submitted,

Nickolaus E. Leggett, N3NL
Amateur Radio Extra Class Operator
1432 Northgate Square, Apt. 2A
Reston, VA 20190-3748
(703) 709-0752
nleggett@earthlink.net

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