

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC. 20554**

**In the Matter of** )  
 )  
**Additional Spectrum for** ) **ET Docket No. 02-380**  
**Unlicensed Devices Below** )  
**Below 900 MHz and in the 3 GHz** )  
**Band** )  
 )  
 )  
 )

**To: The Commission**

**COMMENTS of Nikolaus E. Leggett  
N3NL Amateur Radio Operator**

The following are comments from Nikolaus 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 invention patent pending), and a certified electronics technician.

**Part 15 Devices on the TV Broadcast Band**

The concept of using “smart” low power devices to use “empty” spectrum in the television broadcast band is a clever idea. A transmitting device with a Global Positioning System (GPS) receiver and a data base of licensed stations could potentially use portions of the TV broadcast band without causing major interference.

My comments discuss attributes of this concept including its possible application for neighborhood and community broadcasting services.

**An Opportunity for Neighborhood and Community Broadcasting**

Some of the capacity made available by this approach should be dedicated to very low power neighborhood and community audio broadcasting. Each of these stations would be a FCC certified (type approved) device generating at least several Watts of

radio frequency output power. The station hardware would contain its own integrated GPS receiver and a database of licensed stations. The station would have a hard-wired program with algorithms for determining if it was authorized to transmit based on its geographic location and the listed licensed stations. The database of licensed stations would be updated periodically by an Internet download process.

It would be very useful to have an additional algorithm that would control the output power based on the altitude above or below the average terrain (determined by the geographic location and an integral terrain map). This would be combined with a prohibition against installing the station in a high-rise building or structure. The station would be equipped with FCC-certified feed line cabling and a FCC-certified omnidirectional antenna array. This approved antenna system would limit the feed line length and antenna gain used by the station.

### **Licensing**

Preferably, each of these microbroadcast stations would be operated as an unlicensed device set up by individuals and community groups for neighborhood service. In this approach, the operators of these stations settle interference situations by private consultations and coordination.

Alternatively, a simple online Internet registration system could be used to record the operation of these stations and inform other potential operators of their locations.

### **Services to the Community**

This broadcasting would allow individuals and community groups to transmit program material directed at specific communities and neighborhoods. This is the type of service that was planned for Low Power FM (LPFM) broadcasting. However,

Congressional action effectively blocked LPFM in urban areas. This unlicensed broadcasting would allow low power broadcasting in some urban areas. This would aid the process of community building and provide opportunities for neighborhood talent to participate in announcing, news gathering, and developing program material. Local musicians, poets, and other entertainers would have access to airtime and an appreciative audience. This would provide an important opportunity for residents of inner city neighborhoods as well as suburban areas.

### **Ownership**

An individual or a community group would own each microbroadcasting station. Networking of the stations would be prohibited. In addition, the stations would be designed for and limited to manual operation. These technical standards would prevent the stations from being bought up and consolidated into a big network. They would be truly local entities.

### **Interference**

While these concepts are quite appealing to those of us who are interested in building up viable communities in the inner city (and elsewhere too), the subject of interference must be carefully researched. No one's interest is served if these low power stations are a source of interference to other legitimate uses of the television broadcast bands.

Commissioner Kevin J. Martin has released a partial dissent pointing out that Part 15 devices in the TV broadcast band can cause a big problem for fringe area viewers who are beyond the normal contour of a TV broadcast station: "There is much more broadcast spectrum available in rural areas. But I am concerned about the impact of unlicensed

devices on TV viewers in rural areas. It is viewers in rural areas that are most likely to be without access to cable and to receive their TV from over-the-air broadcast signals. Moreover, many rural viewers receive their TV signals from great distances, beyond the so-called “grade B” contour, outside of which TV signals would typically not be guaranteed protection against interference. I fear that such unlicensed devices could interfere with the broadcast stations many rural viewers watch and that rural viewers would lose the few broadcast signals upon which they rely.”

This is a very valid point. I have lived in a rural area where the only available TV station was a rather snowy distant station. I would not have been happy if a Part 15 device, popping up locally, jammed it.

The best response to this serious concern is to conduct experiments in the field to determine the actual interference potential of this type of Part 15 device. A prototype device should be constructed and tested in the field by the FCC engineering staff. This issue is too important to be left to commenters’ estimates and inputs. Let’s see for real if this interesting concept can be made to work in the actual world. Simulations, mathematical models, and expert testimony are not sufficient to answer this important question. The prototype device(s) tested should have a programmable system so different algorithms can be tested in the field.

These experiments may point out that the algorithm used by such a microbroadcast station must be strictly constructed to protect fringe area viewers as well as viewers in the regular station contours. Indeed, it may be that spectrum other than the TV band would be better for this type of device. Until we see some real-world data on this system it is hard to know.

### **Funding of Field Experiments**

The Commission should contact the various manufacturers who are interested in manufacturing and selling various Part 15 devices for the TV broadcast band. These manufacturers should be encouraged to build one or more prototypes that then would be tested by FCC engineers in the field. The manufacturers would donate the prototypes and the Commission would donate engineering staff time for the testing of this interesting technology.

### **Suggested Action**

The Commission should insist on conducting actual field-testing of prototypes before considering establishing rules for this new type of Part 15 device. This suggestion applies regardless of the uses authorized by the Commission.

**Respectfully Submitted,**

**Nickolaus E. Leggett, N3NL**  
**1432 Northgate Square, Apt. 2A**  
**Reston, VA 20190-3748**  
**(703) 709-0752**  
[nleggett@earthlink.net](mailto:nleggett@earthlink.net)

**January 6, 2003**