

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

In the Matter of

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| Spectrum Policy - |) | ET Docket No. 02-135 |
| Comments to the FCC Spectrum |) | |
| Policy Task Force on Issues |) | |
| Related to the Commission's |) | |
| Spectrum Policies |) | |
| |) | |

To: The Commission

**Comments by Nickolaus E. Leggett
N3NL Amateur Radio Operator**

The following is a set of Comments from Nickolaus E. Leggett, an amateur extra class radio operator, inventor (U.S. Patents 3,280,929 and 3,280,930 and a computer patent application pending), and a certified electronics technician.

My comments are in response to the Commission's request for public comments on spectrum policy issues. The first part of my comments is general comments on spectrum policy and how it can be improved from the standpoint of the individual citizen. The second section is a set of responses to selected numbered questions presented by the Commission.

Spectrum for Citizens

Spectrum policy should be re-oriented so individual citizens have more opportunity to directly participate in radio communication. This should be accomplished by establishing a rule that at least 20 percent of any new spectrum that becomes available is allocated to direct citizen-to-citizen radio communication. For example, as the

micrometer wavelengths (above 300 GHz) become available, at least 20 percent of the new frequencies should be allocated to direct citizen usage. This direct usage would be available without the need to pay fees to an intermediate corporate entity. Example of potential citizen usage include:

- Amateur Radio operation and experimentation – amateur operators are skilled at developing new frequency resources and overcoming physical obstacles such as the high signal attenuation in the micrometer bands.
- Citizens Broadcasting – Neighborhood audio and video broadcasting by individual citizens and by neighborhood groups.
- Wideband Citizens Band – Citizens Band individual video and audio two-way communication over local distances.
- Experimental Uses – hand-held radar “vision” devices for the blind and physically impaired.

These allocations to citizens would increase the development of community communication capabilities without negatively impacting commercial uses of the new spectrum.

Power Broadcasting

A few channels should be explicitly allocated for the wireless broadcasting of power from a microwave source to a receiving system such as a rectifying antenna (rectenna). This service would be used to power long duration aircraft for weather and climate monitoring. In addition, these channels could be used for experiments with solar power satellite (SPS) technology where an orbiting satellite is used to transmit microwave power to a receiver on Earth or to other satellites. These allocations can be

quite small since the continuous wave mode and narrow beam widths used allow a great deal of frequency re-use. Indeed these frequencies can be shared with industrial uses such as radio frequency heating.

Radio Astronomy

Generous allocations should be provided for passive radio astronomy research. This research contributes in a major way to the dynamic development of astrophysics. In addition, these allocations will assist the search for extraterrestrial intelligence (SETI). SETI is a serious scientific activity that is being conducted by professional astronomers (in organizations such as the SETI Institute) and by amateur astronomers (in the SETI League). While the probability of success is difficult to predict, successful reception of artificial signals from other worlds in space would have enormous cultural implications as well as incredible economic value. Any received data on technical systems alone would be of great value. It would be worthwhile to invest some spectrum for radio astronomy activity in order to obtain this unique information as well as physical science data.

Responses to Numbered Questions

The remainder of my comments is responses to selected numbered questions posed by the Task Force.

Question 1 in Market-Oriented Allocation and Assignment Policies – What specific policy and rule changes are needed to migrate from current spectrum allocations to more market-oriented allocations? A major issue here is the constitutionality of such market-oriented allocations. As attorney Donald J. Schellhardt has suggested, auctions of licenses may be unconstitutional under the 14th Amendment of

the U.S. Constitution. At the very least, the Task Force and the Commission should carefully review all proposed market-oriented rules to make sure that they do not favor wealthy organizations over small organizations and individuals. If the new regulations lead to a situation where only the largest organizations have access to plentiful spectrum and the rest of the populace is shut out, then the legitimacy of the Commission and the Federal Government itself will be negatively impacted.

Question 3 in Market-Oriented Allocation and Assignment Policies – Should spectrum policy be different in different portions of the spectrum or in different geographic areas? I agree with the concept that spectrum-licensing policy should be different in the upper millimeter wave spectrum. The short range and very narrow beams mean that an intense amount of frequency re-use is possible. Each station is like a low power “flashlight” that can be operated without impacting other flashlight users. In addition, a very broad bandwidth is available for use. This is because the spectrum gets larger as you go up in frequency.

This means that the scarcity argument for spectrum allocation does not apply in this frequency range. Anyone who wants to use some of these frequencies should be allowed to do so. Individual and community broadcasters for example, who have been barred from the conventional broadcast bands, should be encouraged to use this new spectrum. In the case of community broadcasting, the transmitting station could use a rotating lighthouse type radio beam that would distribute packets of digital program material that would be buffered and assembled by each receiver into a continuous program.

A significant fraction of these frequencies should be allocated for citizen's use without the need for auctions and licenses at all. This would be a free-speech area where any U.S. citizen would be permitted to operate his own station for either local broadcasting, two-way communications, data transfer, and for the remote control of robotic devices. The spectrum bandwidth is plentiful enough that video communications as well as audio communications could be accommodated.

The concept of varying the spectrum policy between rural and urban areas is an interesting one. This has already happened in the case of Low Power FM Broadcasting (LPFM) which has been in effect banned in urban areas and permitted in rural areas. Intentionally adjusting spectrum policy based on population density will be difficult to administer from a regulatory standpoint especially as regions transition from low density to high density. Do you remove incumbent users as urban sprawl arrives in their region? In addition, you have the interesting situation where rural residents would have more spectrum usage rights than urban residents? Is that acceptable under the U.S. Constitution? This approach to spectrum policy will lead to privileged areas and non-privileged areas of the Nation. I suspect that courts will have problems with it. In comparison, adjusting spectrum policy by frequency band does not have this difficulty.

Question 4 in Market-Oriented Allocation and Assignment Policies – Are there circumstances under which adopting more market-oriented allocation and assignment policies would affect other important Commission objectives? Yes, this is certainly correct. For example, amateur radio supports several objectives identified in Section 97.1 of the Commission's rules. Yet, amateur radio cannot be evaluated from a market perspective. Introducing auctions or the sale of licenses in this service would

inhibit or perhaps destroy the objectives that are established for this service. A similar situation exists for radio astronomy. What is the market value of new data obtained on pulsar emissions? The Commission regulates other services such as public safety, aviation radio, and non-commercial broadcasting that do not have a direct market price or value and yet are very important to the successful functioning of our Nation. In my view, many of these non-commercial services are more important to the Nation than the commercial communications services that are generally favored by the Commission.

Pricing these non-commercial uses off of the spectrum would not serve the public interest in any way. For example, a city with an already strained budget should not be forced to pay spectrum usage fees in order to continue operating its police and fire radio. A twelve-year-old ham radio operator should not be charged license or usage fees. Universities should not have to bid against commercial interests to obtain spectrum for radio astronomy observations. If these fees are imposed, then it will be clear that this Nation is moving towards a situation where the big industries are dominant and the other values do not count. In the long run, such a bias would damage the future of the Nation.

Question 5 in Market-Oriented Allocation and Assignment Policies – Should more spectrum be set aside for operating unlicensed devices? Should the kinds of permissible unlicensed operations be expanded? The answer to both of these is YES. As we move up in frequency, the scarcity of spectrum declines. This means that we can set up a truly free environment where virtually anyone can own and operate radio equipment. This would be similar to the current United States market in road vehicles. Within wide parameters of licensing, anyone can purchase and operate a bicycle, moped, motorcycle, automobile, van, SUV, or truck and use it on the roads. Let's do this in

bands within the upper reaches of the radio spectrum. This would be a truly free market where anyone can operate instead of the dubious free market of the auction where only the richest organizations win access to the spectrum and everyone else loses.

Question 5 in Market-Oriented Allocation and Assignment Policies – How can the Commission better facilitate the experimentation, innovation and development of new spectrum-based technologies and services...? An immediate method for doing this would be to allocate additional spectrum to the amateur radio service for conducting experimental work. This new spectrum should be established as Pioneer Bands where only home-built equipment is allowed and where the development of novel radio designs is encouraged.

In addition, an experimental radio service could be established where independent inventors are provided temporary access to radio bands for the purpose of developing new radio inventions. This access would be shared with other inventors. A fixed license term of five years would be provided on request with a simple application process for the license. Renewal would only be available if the person had filed a patent application on the radio technology developed based on this access.

Any Commission plan to encourage experimentation and innovation must include the independent inventor and experimenter. These people are often the source of the most original new technologies.

Respectfully submitted,

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