Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of Spectrum Policy Task Force Seeks Public Comment on Issues Related to Commission s Spectrum Policies	)	ET Docket No. 02-135

COMMENTS OF THE DANDIN GROUP

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July 8, 2002

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The Dandin Group, Inc., a small entity focused on the development and deployment of advanced wideband wireless communications technologies, submits these comments in response to the Public Notice in the above-captioned proceeding (the "*Notice*"). The Commission deserves praise for initiating this proceeding which will start the long regulatory process towards new rules and policies for the use of the radio spectrum.

I. BACKGROUND AND STATEMENT OF INTEREST

Established as a small business in 1999, the Dandin Group provides high speed Internet access to remote locations using advanced wideband wireless technologies. Our goal is to develop and deploy products and services that provide high quality Internet access for people in remote, underserved locations. Although the company is young, its members have many years of experience in wireless communication and the deployment of wireless technologies. The scope of their experience includes involvement in Part 15 and Part 97 Spread Spectrum regulatory issues; working with NSF grants to bring Internet access to Mongolia[1] and rural schools in Colorado[2]; participation on the FCC's Technology Advisory Council (TAC).

The *Notice* covers several areas of interest to the Dandin Group. These include allowing changes to the regulations which today limit the deployment of wideband technologies such as ultra-wideband (UWB), spread spectrum (SS) and in general, broadband wireless technologies where range / distance and coverage is an issue, thereby allowing new types of wireless systems to be tested and deployed. The use of software-defined radios (SDR's) may allow new types of spectrum sharing that are currently precluded by today's conventional equipment and the Commission's spectrum management philosophy. Products developed and proven not to interfere with incumbent systems and spectrum allocations could be permitted wider use through the advent and adoption of a new spectrum management paradigm.

Dandin Group believes that today's communications technology is moving towards a world of all digital transmitters and receivers. These advances in technology,

[1] "Wireless in Ulaan Bataar," Dewayne Hendricks, WA8DZP, Proceedings of the 16th ARRL and TAPR Digital Communications Conference, 1997

combined with the swift evolution of cell based transmission and switching protocols, is opening up a new set of possibilities for unique new services utilizing intelligent networks. These will contain smart transmitters, receivers and switches. Today's Internet is perhaps the best example of a self regulating structure that embodies these new technological approaches to communications in the networking domain. However, to date, many of these innovations have not moved into the wireless networking arena. We feel that the radio networks of the future will involve a mixture of links and switches of different ownership, which terminate at the end-user in the first mile via relatively short distance links. What will then be required is a built-in, distributed, self-governing set of protocols to cause the network's behavior to make more efficient use of a limited, common shared resource, the radio spectrum. Creating such a self-regulating structure for the optimal sharing of spectrum will require much effort. One of the major problems which stands in the way of these new approaches today is the current FCC regulatory environment and the manner in which spectrum is managed and allocated under its rules.

One of the major hurdles that a wireless entrepreneur encounters who wishes to develop innovative new communications products which involves radio is access to the requisite amount of spectrum. This process makes the involvement of the wireless entrepreneur with the government mandatory, which immediately puts the entrepreneur at a disadvantage when compared to entrepreneurs in the computer sector where government involvement is minimal. As a result, innovation has occurred at a much slower pace since the use of technologies such as SS and UWB require the use of more spectrum and not less in order for their advantages to become apparent when it is used for high-speed data transmission.

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[2] NSF Wireless Field Test Project<http://wireless.oldcolo.com/course/mongol.htm>

Historically, the current regulatory approach to radio has been based upon the technology that was in use at the time the the Communications Act of 1934 was framed, basically what we would call today, dumb transmitters speaking to dumb receivers. The technology of that time reserved bandwidths to be set aside for each licensed service so that spectrum would be available when needed. Given this regulatory approach, many new technologies cannot be accommodated since there is no available unallocated spectrum to 'park' new services. However, given the new set of tools available to the entrepreneur with the advent of digital technology, what once were dumb transmitters and receivers can now be smart devices, which are capable of exercising greater judgement in the effective use and sharing of spectrum. The more flexible the tools that we incorporate in these devices, the greater the number of uses that can be accommodated in a fixed amount of shared spectrum.

One of the most promising regulatory actions by the Commission in recent times was the move in 1981 to permit the use of spread spectrum technology in unlicensed devices with the release of landmark NOI[3]. This NOI eventually resulted in a new type of device that operates under Part 15 regulations and are deployed in what are called the industrial, scientific, medical (ISM) bands. More important, these devices are forbidden to operate at power levels greater than 1 watt and their transmissions must be spread a minimum amount across the assigned spectrum.

Those restraints notwithstanding, the 1985 Part 15 ruling, and later amendments to those rules have already spawned the development, manufacture and marketing of a wide range of 'no license required' products. Because mass manufacturing has now occurred, spread spectrum products for data transmission (802.11x) from the sixty or so

[3] Authorization of spread spectrum and other wideband emissions not presently provided for in the FCC Rules and Regulations Gen Docket No. 81-413

current vendors carry modest price tags that have made a acknowledged revolution possible with an estimated 1.5 million devices being shipped each month. Today a radio that can handle Ethernet traffic (10 Mbps, suitable for high speed computer communications) up to a distance of about 40 Kilometers (25 miles) costs $500. Devices with lower capability, operation at T1 speeds (1.5 Mbps) to a range of 25 kilometers or so, cost $250. For very short ranges, such as for communications within a building, wireless local-area network (LAN) cards for PC's are priced as low as $50.

There is every reason to believe that these prices will drop as manufacturing volumes continue to increase to meet the growing market demand for higher bandwidth and secure wireless connections from PC's to the Internet. In the future, people may, for example, routinely rely on wireless transmission to reach a central system that would then connect to a traditional network of ground-based lines. We predict that reliable, secure unlicensed data radios operating at T1 or higher speed to a range of more than 30 kilometers will soon cost less than $300 each.

The Internet today represents the best example of the self-regulating mechanism that will be necessary in the new radio environment that we envision. The creation of a similar, decentralized structure for the optimal sharing of the radio spectrum will require a substantial effort by a combination of telecommunications experts and entrepreneurs working with the various regulatory bodies around the world. We believe the deployment and growth of such a system is achievable through increasingly 'smart' electronics, and we envision a self-governing set of protocols that are built into these SDR devices. Packet radio operations as currently deployed in the Amateur Radio Service is a good existence proof of what is possible today. As advanced radios are deployed, society must tackle the crucial issue of incorporating both positive and

negative incentives within the network infrastructure itself to make the best use of a shared common resource, the radio spectrum.

II. CONCLUSION

The Dandin Group trusts that the Commission will act promptly to develop new spectrum management policies which will encourage the development and deployment of advanced wideband wireless communications systems which at their core are SDR's. Utilization of this technology will satisfy the telecommunications needs all Americans, while creating a new era of opportunity based on access to the Information Age.

Respectfully submitted,

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