

**Before the
Federal Communications Commission
Washington, DC 20554**

In the matter of)
)
Modification of Parts 2 and 15 of the)
Commission's Rules for unlicensed devices and) ET Docket No. 03-201
Equipment approval.)

Comments of Pegasus Technologies, Inc.

Pegasus Technologies, Inc. is a developer and marketer of RF products including FCC certified modular transceivers. We are also the prime sponsor of Spread Spectrum Scene Online (<http://sss-mag.com>) and our president is the chief technical editor of that publication.

We applaud the flexibility in regulation that is demonstrated by this NPRM. The use of flexibility is especially important when regulating a rapidly evolving technology such as the unlicensed transmitters that are the subject of this MPRM.

Our comments are broken down by the subject matter topics listed in the NPRM:

Advanced Antenna Technologies

We are not users or currently developers of this type of antenna technology. We are concerned that our customers whose applications are primarily industrial remote control and data acquisition might be affected by proliferation of relatively high power WISP signals. We believe that the 5.8 GHz band is a more appropriate frequency for operation of toll WISPs. We feel that the advanced antenna technology should be allowed for that band and not for 2.4 GHz.

Replacement Antennas and Flexible Certification

The proposed antenna flexibility seems to mirror the flexibility already exercised in the existing modular certification. If the intent is to make all Part 15 certifications similar to modular certification we feel that this is a beneficial change.

The modification to 15.204 that allows "professional radio system installers" to make field changes to unlicensed transmitters is possibly useful and necessary to WISPs but we feel that original equipment manufacturers that install certified modules (often of their own design) into mass produced products have far greater technical competence. We believe that this loosening of the regulations should be allowed for modules also and that OEMs should be recognized as professional installers. Specifically we ask that the last sentence of 15.212 (d) be eliminated.

Amplifiers

We believe that the use of external RF power amplifiers under the provisions of 15.247 will open Pandora's box of escalating interference and violations of FCC rules. Even with the current state of the rules it is possible with minimal effort to locate sellers of amplifiers that appear to violate FCC rules. If a mix and match approach is taken to transmission systems operating under 15.247 these amplifiers will become vastly more prevalent. It will be trivial for manufacturers of such amplifiers to "throttle back" the output power of their amplifiers for meeting the rules but have a user accessible control that would allow the "professional radio system installers" to set the output power many times higher than is allowed by the rules. This could even become a "whisper spec" for such devices.

We know of no method of allowing a linear amplifier to amplify 15.247 signals but not others. Further we believe that allowing external amplifiers to become more common will inevitably lead to several connector

types that are now considered to be non-standard to be much more common. This is because the amplifiers will need interconnection with the transmitter and the antenna. All of these interconnections will include connectors and the “professional radio system installer” will seek a ready source of connectors or adapters through local retailers or catalog merchandisers. The possibility of adding yet another category of non-standard connector to distinguish between 125 mW devices and 1 W devices makes us shudder.

We feel that the reason for the non-standard connector is precisely to make it more difficult for the casual user to violate the Part 15 restrictions. Opening up the use of external amplifiers seems to remove the primary motivation. If external amplifiers are allowed we recommend removing all reference to non-standard connectors in Part 15 C.

Hopping Channel Separation

We agree with the Bluetooth SIG that a channel spacing equal to the 20 dB bandwidth is too conservative and a waste of spectrum. We believe that the two-thirds of 20 dB bandwidth channel separation for frequency hopping systems should be adopted but not limited to 2.4 GHz. As a manufacturer of 915 MHz band frequency hopping modules we would also like the flexibility of spacing our channels similarly. We see no technical reason why the 915 MHz band should be treated any differently than the 2.4 GHz band.

Modular Transmitter Approvals

We are aware of many instances that currently could benefit from the ability to have modular approval of systems that are composed of an RF frontend and a separate control element. We are concerned about the terminology used in this NPRM however. In this author’s 30 years experience (dating to the Intel 4004) of applying microprocessors and microcontrollers to various applications I have never seen the term ‘firmware’ used in the same sense that the FCC is using it in this NPRM. This leads to confusion to the meaning of the regulation.

From the Webopedia (<http://www.webopedia.com/TERM/f/firmware.html>) the term firmware means:

Software (programs or data) that has been written onto read-only memory (ROM). Firmware is a combination of software and hardware. ROMs, PROMs and EPROMs that have data or programs recorded on them are firmware.

Firmware does not include a processor such as a microcontroller, although a microcontroller that has built-it program storage memory such as flash ROM can include firmware. Industry standard usage is that firmware is software that is stored in non-volatile memory.

From the usage in the NPRM it is clear that the FCC intends firmware to mean the element that controls the RF front end. Instead of referring to this as firmware we would suggest that a less confusing term be used. A possibility is to change the language of the proposed 15.212(b) to: **For partitioned modules, control information and other data may be exchanged between the control element and the radio front end.**

Please see our comments under Antennas for our reasoning in requesting the elimination of the non-standard connector requirement and the restriction on “professional installation” classification.

It is unclear to us what form of “signal injection testing” is being referred to in proposed 15.212 (e)(2). There does not appear to be any other reference to this type of testing elsewhere in part 15.

Improving Sharing in the Unlicensed Bands

We agree that the unlicensed bands have been a tremendous success in terms of increasing the utilization of wireless communications. We so not, however, feel that additional complexity of transmitters is warranted in the existing bands. Many of the devices that operate in the 915 MHz and 2.4 GHz bands are very low

cost devices that are currently transmit – only devices. We feel that imposing spectrum etiquette on these existing bands would greatly limit the future development in these bands.

We do feel that if additional unlicensed space is made available there is room for imposing etiquette on at least some of these bands. This would be especially useful for toll WISPs since this would allow for a higher level of reliability for a service that is being paid for by a consumer on a monthly basis. In this case the WISPS would presumably be able to afford the more complex equipment that will allow spectrum etiquette.

Respectfully submitted,

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