

THE AMERICAN RADIO RELAY LEAGUE INC



The American Radio Relay League Inc is a noncommercial association of radio amateurs, organized for the promotion of interest in Amateur Radio communication and experimentation, for the establishment of networks to provide communication in the event of disasters or other emergencies, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

ARRL is an incorporated association without capital stock chartered under the laws of the State of Connecticut, and is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1986. Its affairs are governed by a Board of Directors, whose voting members are elected every three years by the general membership. The officers are elected or appointed by the directors. The League is noncommercial, and no one who could gain financially from the shaping of its affairs is eligible for membership on its Board.

"Of, by, and for the radio amateur," the ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

A *bona fide* interest in Amateur Radio is the only essential qualification of membership; an Amateur Radio license is not a prerequisite, although full voting membership is granted only to licensed amateurs in the US.

Membership inquiries and general correspondence should be addressed to the administrative headquarters; see pages 14 and 15 for detailed contact information.

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"IT SEEMS TO US..."

Regulation by Bandwidth

At the dawn of the age of radio the concept of bandwidth did not exist. Things were simple: A spark transmitter radiated energy, and a receiver was intended to capture as much of it as possible.

As more stations filled the airwaves the concept of wavelength began to emerge. Transmitted energy could be concentrated at a certain wavelength (the longer the better) and the receiver could be tuned to favor that wavelength. Eventually, amateur stations were consigned to the "short waves" in order to protect longwave navy and commercial stations from interference.

Amateurs were the first to explore the short waves and the first to abandon spark (over the objections of some diehards) in favor of the new "continuous wave" transmitters. By the time of the 1927 Washington International Radiotelegraph Convention the extraordinary value of the short waves, with their unique property of ionospheric propagation, was obvious to amateurs and non-amateurs alike (and is still obvious, except to the proponents of Broadband over Power Lines—but that's another subject). In the first international table of frequency allocations, radio services were separated from one another by frequency (the inverse of wavelength) to avoid interfering with one another. The Washington Convention also adopted this rule: "The width of a frequency band occupied by the emission of a station must be reasonably consistent with good current engineering practice for the type of communication involved."

As the stability of transmitters and receivers improved, receiver selectivity could also be improved to match the receiver's bandwidth with that of the transmitter. By the summer of 1932, the *QST* description of Jim Lamb's high-selectivity "single signal receiver" had set a new engineering standard for radio receivers that surpassed anything then available commercially.

Despite this emphasis on minimizing bandwidth, the rules governing amateur stations did not specify the maximum bandwidth that our signals could occupy—and still do not, with a few exceptions. There is a general rule, §97.307(a), that states: "No amateur station transmission shall occupy more bandwidth than necessary for the information rate and emission type being transmitted, in accordance with good amateur practice." Subbands are defined by emission type, not by bandwidth.

In the 1970s the FCC tried to shift to a regulatory regime based on bandwidth, but the effort ran aground because of two problems. First and probably foremost, the new regime would have outlawed some modes, such as double-sideband AM in the HF bands. That made it very unpopular with a number of amateurs. Second, determining the bandwidth of a transmitted signal requires equipment that was not available to most amateurs. It's one thing to say how wide a signal can be; deter-

mining whether a signal is in compliance is something else.

Even the definition of "bandwidth" is not simple. FCC's Part 97 defines it as: "The width of a frequency band outside of which the mean power of the transmitted signal is attenuated at least 26 dB below the mean power of the transmitted signal within the band." The international Radio Regulations define "necessary bandwidth" and "occupied bandwidth"—neither of which aligns with the Part 97 definition of the more general term.

Despite these difficulties, and with the admonition "if it isn't broken, don't fix it" firmly in mind, in July 2002 the ARRL Board concluded that the time had come to regulate amateur subbands by bandwidth rather than by mode. What *was* broken was amateurs' ability to explore new HF digital modes without interminable debates about what was and was not permitted. The existing rules were written in the days of mechanical teleprinters, with provisions for 25-year-old AMTOR and packet radio grafted on. Interpreting them in light of current digital technology is the engineering equivalent of Talmudic scholarship. HF digital work has continued under a provision for specified digital codes to use "any technique whose technical characteristics have been documented publicly," but this provides neither guidance to experimenters nor protection to other amateurs. An Op-Ed by Mark Miller, N5RFX, in May 2004 *QST* explained some of the history, problems with the *status quo*, and the benefits of regulation by bandwidth rather than by mode.

A great deal of work has been done over the past two years to turn the principle adopted by the ARRL Board into regulatory language that will achieve the benefits with as few unwanted side effects as possible. The objective has been to change as little as possible with regard to traditional modes while making provision for digital modes in parts of the bands with maximum bandwidths that are appropriate to those band segments.

The Board reviewed a draft petition for rule making at its January 2004 meeting and asked the Executive Committee to continue polishing the draft. The Executive Committee reviewed a revised draft at its March meeting and found that a few corrections still needed to be made, but took the important step of deciding that a synopsis and explanation of the petition should be made available to ARRL members *before* it is filed with the FCC. Barring a major catastrophe, by the time you read this the synopsis and explanation should be available on the ARRL Web site at www.arrrl.org/announce/bandwidth.html.

Please look it over and let us know (via the e-mail address that will be provided) if you have any questions or if you think the proposal as drafted might have undesirable consequences. Of course, it's also okay to tell us you like it!—David Sumner, K1ZZ