To: Federal Communications Commission

From: D. Richard Miller, PhD – N1RM

Subj: Opposition to NPRM 16-96, WT Docket 16-239, Amendment of Part 97 of the Commission’s Amateur Radio Service Rules to Permit Greater Flexibility in Data Communications

With the elimination of the 2.8 kHz bandwidth constraint, the proposed rules will not achieve their desired goals, and will likely decrease emergency communications efficiency, not increase it. Removing the baud restrictions in the current rules is a very positive thing, but without an accompanying bandwidth restriction, the concept becomes a very bad idea. My argument is as follows:

1. Paragraph 10 of the NPRM proposes that the imposition of a bandwidth limitation on RTTY and digital signals in the HF spectrum is not needed and will not be adopted. Part of the reasoning is that only the emissions allowed in 97.309 are allowed, that no bandwidth limitations are specified (other than for 60M), and part 97.307(a) “already provides that 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.”  
     
   This line of reasoning held together *while the data rate limitation was in place*. By removing the data rate limitation and not putting a bandwidth restriction in place, it permits arbitrarily wide signals on these bands, as long as the operator can justify the bandwidth by the data rate he is trying to achieve.
2. Paragraph 11 of the NPRM implies that a 2.8 kHz bandwidth limitation could “undermine the goal—fundamental to the amateur service—of encouraging advances in technology if amateur radio operators were thereby prevented from stepping beyond today’s radio science.”  
     
   The NPRM in this statement ignores fundamental information theory, as well as decades of advances in the radio art where innovation came from improving information rate *in constrained bandwidths.* Digital broadcast television packs several high definition program streams in to the same bandwidth as analog television’s single, low definition signal. Cellular systems pack dozens of full-duplex conversations into bandwidths once needed for a single analog FM voice channel. Removing restrictions on bandwidth would actually *discourage* advancement in radio science since it is trivially easy to increase data transfer rates by increasing bandwidth. Innovation comes from improving spectral efficiency, not just data rate. With no bandwidth constraint, there will be no motivation to improve spectral efficiency.
3. One of the key motivations cited in the NPRM is the quality of back up data communications in the event of catastrophe. Once again, removing the bandwidth constraint from digital modes could have the unintended consequence of reducing the effectiveness of communications supported by the spectrum. If a protocol is invented that occupies 10 or 20 KHz of bandwidth, then the amateur bands will quickly be saturated by well-meaning individuals. Hams in isolated disaster areas that cannot afford the very pricey equipment needed for these advanced modes, and who need to call for help using voice or Morse code will not stand a chance in such a scenario. One need only examine the ubiquitous authorization of “RTTY/Data” in part 97.305 of the rules to realize that unconstrained bandwidth in these modes could preclude other, potentially life-saving, modes of communication.
4. For these reasons, I strongly urge the commissioners to reconsider their position against the ARRL recommendation of putting a 2.8 KHz restriction on digital signals. As citizens, and particularly as licensed amateurs, we look to the FCC to act for us as stewards of the remarkable and scarce resource that is the RF spectrum. By permitting transmissions of signals with no constraint on bandwidth in the HF/MF spectrum, you will be doing a disservice to not only the US citizens and amateurs that form your constituency, but millions of other users HF spectrum worldwide. HF knows no national boundaries. I applaud the NPRM for finally eliminating the counter-intuitive baud rate restriction, but without an accompanying constraint on bandwidth, we will make things much worse – not better.