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

In re Petition for Rulemaking) Proceeding RM-11708
)
ARRL, the national association for Amateur Radio) Amendment of Part 97 of the Commissions
) Amateur Radio Service Rules to Permit Greater
Petitioner) Flexibility in Digital Data Communications
)
COMMENT
Filed November 21, 2013)
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)

I support removing symbol rate from amateur radio regulations; however, in order to encourage experimentation and the development of new and more efficient data transmission protocols, there *should not* be a blanket bandwidth limit of 2.8 kHz for data emissions below 29.7 mHz.

Of course, the motivation of those advocating a bandwidth limit of 2.8 mHz is to help make the best use of scarce spectrum resources. However, it is a matter of fact (as established by Claude Shannon’s work on communications theory) that spreading communications over a broader bandwidth ironically (and counter-intuitively) makes it possible to accommodate *more* communications channels. This concept is called *processing gain*, and permits net data throughput (among multiple users) to be higher than can be achieved with dedicated narrow channels.

One of the principles upon which the amateur radio service and the rules are to be based is “advancing skills in both the communication and technical phases of the art” (47 CFR § 97.1(c)). It is true that permitting arbitrarily wide bandwidths for data transmission in the HF radio spectrum would compromise other goals of the amateur radio service, e.g., public service and emergency

1 communications (47 CFR § 97.1(a)). But the best solution for accommodating all of the purposes of the
2 amateur radio service (as listed at 47 CFR § 97.1) is to allocate a portion of each HF amateur band (e.g.,
3 ten to fifteen percent) of the spectrum of each band) for experimentation with signals which fit within this
4 “experimental mode” sub-band, but for which there is no other arbitrary bandwidth limit.

5 As an example of the benefits which could eventually be realized with this proposal, consider the
6 situation of regional data communications in support of emergency communications using the NVIS (near
7 vertical incidence skywave) propagation mode. Although there is often substantial spectrum congestion
8 using longer-distance skywave propagation, it is most common that there is not congestion in spectrum
9 near the “critical frequency” – the frequency which supports NVIS propagation, but which is not suitable
10 (due to RF absorption) for longer-distance communications. Experimentation with this kind of
11 communications could result in better communications support for emergency communications.

12 A good starting point would be to allocate sub-bands in the 3.5 MHz band (e.g., 50 kHz) and the 7
13 MHz band (e.g., 30 kHz) which could be used only with the NVIS propagation mode for wider bandwidth
14 data communications which fit in the sub-band. (The NVIS restriction would usually result in higher-
15 bandwidth data transmissions using 7 MHz during daylight hours, and 3.5 MHz in evenings.)

16 In the meantime, I encourage the Commission to consult with its own radio engineers to ensure
17 that the nature of wider-bandwidth data transmission and the *processing gain* which results in *better*
18 *allocation of scarce spectrum resources* is taken into account before any change is made in the rules.

19
20 Dated this 23rd day of November, 2013.

21 Respectfully,

22
23 /signature/

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