

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

In the Matter of )  
 )  
Amendment of Part 97 of the Commission's ) **RM - 11708**  
Amateur Radio Service Rules to Permit Greater )  
Flexibility in Digital Data Communications )

To: The Chief, Wireless Telecommunications Bureau  
Via: The ECFS

**REPLY COMMENTS OF PETITIONER**

ARRL, the national association for Amateur Radio (ARRL), Petitioner in the above-captioned proceeding, hereby respectfully submits its reply to certain of the comments filed in response to the Public Notice dated November 21, 2013 (Report No. 2993). The Public Notice solicited comments on ARRL's *Petition for Rule Making* filed November 15, 2013 (which was amended by *Erratum* filed November 26, 2013 (the Petition)). Though most of the comments filed support the relief requested in the Petition, there were some comments filed in Opposition thereto. To these opposing comments, ARRL replies as follows:

1. The response to the Petition has been significant. At this writing, there have been approximately 900 comments filed, a significant majority of which support the proposals in the Petition. Those that do not support the Petition do not, in general, challenge the removal of the symbol rate limitation for data emissions in the band segments where RTTY and data emissions are now permitted. Rather, they tend to view the proposal to establish a maximum occupied bandwidth of 2.8 kHz for data emissions in the medium-frequency (MF) and high-frequency (HF) bands where data emissions are permitted now as an enabling provision, rather than what it is: the imposition of a *limitation* on the maximum bandwidth of data emissions where none exists now. That is a fundamental misunderstanding that is consistently reflected in the opposing

comments in this proceeding. The reasons that ARRL proposed a 2.8 kilohertz bandwidth limitation as an incident of its proposal to eliminate the symbol rate limitation are several: (1) There is now no bandwidth limitation for data emissions in the band segments<sup>1</sup> where data emissions are permitted (with the exception of rules which limit unattended operations; those rules are not affected whatsoever by ARRL's Petition); (2) The symbol rate limit does not now act as a bandwidth limitation for HF data emissions. Given modern data technologies, there is no necessary correlation between the symbol rate and the bandwidth of a data emission.<sup>2</sup> The symbol rate limit does not limit data emissions to bandwidths less than 2.8 kilohertz, or 3 kilohertz, or any other wider bandwidth in the HF RTTY and data subbands. Rather, (3) it acts only as a limit on the efficiency of data emissions in the HF bands as a practical matter, and as an artificial and arbitrary filter on the types of emissions that can be utilized by radio amateurs. (4) An occupied bandwidth limit of 2.8 kilohertz is wide enough that it will permit to continue those data emissions currently permitted by the existing rules, and it will permit additional data emissions that are now prohibited because the symbol rate limit of 300 baud applicable to the HF bands below 28 MHz precludes them. At the same time, a 2.8 kilohertz bandwidth limit is sufficiently narrow that it limits the ability of any given data station to usurp overly large portions of the limited RTTY/data subbands. While some opponents of the Petition take issue with this last conclusion, they offer no evidence that the rule changes proposed herein will create a situation in which data transmissions will overwhelm the subband, precluding narrow bandwidth emission communications. Furthermore, a bandwidth limit much lower than 2.8 kilohertz would have the effect of precluding those data emissions that are already in constructive use in the RTTY/data subbands now. To the extent that those opponents of the

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<sup>1</sup> i.e. 1.8-2.0 MHz; 3.5-3.6 MHz; 7.000-7.125 MHz; 30 meters; 14.00-14.15 MHz; 18.068-18.110 MHz; 21.0-21.2 MHz; 24.89-24.93 MHz; and 28.0-28.3 MHz.

<sup>2</sup> See, the ARRL Petition, at paragraph 9.

Petition seek to preclude data emissions at HF that are ongoing now, or if they believe that it is necessary to continue a completely outdated regulatory restriction that has no relevance to modern data communications as a primary means of avoiding interference to CW, RTTY or narrower-bandwidth data emissions such as PSK-31, ARRL simply disagrees.<sup>3</sup> The Commission has properly chastised the Amateur Service for resisting deregulatory proposals that are designed to enable Amateur experimenters to refine and adapt technologies.<sup>4</sup> ARRL is of the view that outdated Commission regulations that needlessly preclude experimentation with data technologies should not be preserved. Outdated regulations are not a viable alternative to cooperative sharing arrangements in the HF bands through voluntary band plans. Indeed, the high degree of responsibility that cooperative sharing at HF has always required has been standard procedure since the beginning of Amateur Radio and it has worked well to date. The Commission's observation in 1978 was spot on: "...[A]mateurs should be on the forefront of technical advancement, and...any attempt by the Commission to spur amateur experimentation

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<sup>3</sup> So does the Commission. In 2008, the Commission dismissed a Petition for Rule Making that would have had the practical effect of precluding data emissions permitted now. The Commission stated: "Additionally, we believe that amending the amateur service rules to limit the ability of amateur stations to experiment with various communications technologies or otherwise impeding their ability to advance the radio art would be inconsistent with the definition and purpose of the amateur service. Moreover, we do not believe that changing the rules to prohibit a communications technology currently in use is in the public interest." *Mark Miller*, DA 08-1082, 23 FCC Rcd. 7449 at 7455 (2008).

<sup>4</sup> The Commission in 1978 decided not to adopt a proposed table of maximum bandwidths, stating that:

The comments indicated that for the sizeable portion of the amateur community who do not experiment, the present emissions table is preferable. Accordingly, the Commission will not adopt the proposed maximum bandwidth table. We are disappointed that the comments on our proposal were unfavorable, because we continue to believe deregulation is a sound idea. This proposed new bandwidth table would have given the Amateur Radio Service a new opportunity to fulfill one of its bases and purposes, "advancement of the radio art," by allowing the amateur the freedom to experiment with new emissions. However, many commenters disagreed with the bandwidth concept because of the added cost and responsibility they said it would place on amateurs. This loses sight of the concept that amateurs should be on the forefront of technical advancement, and that any attempt by the Commission to spur amateur experimentation will necessarily increase amateur responsibility. The Commission will continue to consider ways of introducing further deregulation and simplification in the Amateur Radio Service.

*Second Report and Order* in Docket 20777, FCC 78-588, 43 Pike & Fischer Radio Regulation 2d 1622, 1623 (1978).

will necessarily increase amateur responsibility.” ARRL is of the view that the Amateur community is capable of assuming that responsibility in this instance.

2. Many of the opposing comments filed in this proceeding to date reflect a generalized concern that any increase in data emissions at HF will create new incompatibility between data emissions and ongoing CW, RTTY and narrow bandwidth data modes that are popular in the low ends of MF and HF bands. They argue that the rule changes in the Petition would permit mixed “wide bandwidth” data emissions where narrow bandwidth emissions such as CW and PSK 31 operate now. The opponents say that this mixture will result in interference to those narrower emission types because licensees using HF data emissions have no concern with ongoing communications before commencing transmissions. A corollary argument made by opponents is that the Petition is an effort to benefit a very few operators who choose to experiment with and use HF data emissions which necessitate higher symbol rates than are now permitted, at the expense of many thousands of licensees who operate narrowband data, RTTY and CW in the lower segments of the HF bands. ARRL believes that these fears are unwarranted, and that they reflect a misunderstanding of the limits of the proposal in the Petition and the current regulatory scheme in effect in those subbands.

3. To address these and other opposing arguments it is helpful to review the premises for ARRL’s Petition. The present rules restricting symbol rates were established in 1984, and were premised on the state of the art at that time. The state of the art in HF digital communications has advanced substantially since the present rules were first written. Transmission protocols are available and in use in other services in which the symbol rate exceeds the present limitations of Section 97.307(f) of the Commission’s Rules, but the necessary bandwidths of those protocols are within the bandwidths of data emissions now permitted and used in the HF bands and the

technologies are capable of higher data rates, which translates directly to greater spectrum efficiency.<sup>5</sup> As but one example, it makes no sense whatsoever to permit PACTOR 3 but not PACTOR 4 in the same data subbands.<sup>6</sup> The now-arbitrary symbol rate limit unnecessarily inhibits HF data experimentation. It reflects 1980s data technology, and it prohibits radio amateurs from utilizing state-of-the-art technology. Eliminating the symbol rate limitation for data emissions and substituting a maximum authorized bandwidth would permit the utilization of all HF data transmission protocols presently in constructive use in the Amateur Radio Service, as well as current and future state-of-the-art protocols that fall within the authorized bandwidth. The genesis of the Petition was this concern and nothing more.<sup>7</sup> Supporting equipment suppliers or users of Winlink2000 was never any part of the justification for the Petition whatsoever.<sup>8</sup>

4. Those who suggest that the Petition is an effort to benefit the few<sup>9</sup> who choose to experiment with data emissions at HF at the expense of the many who operate CW, RTTY and narrow bandwidth data communications in the lower portions of the HF bands should note that nothing in the ARRL Petition creates a referendum on data communications in those subbands. Data emissions are specifically permitted in those segments now and have been since prior to 1984. There is no CW subband; the rules permit CW everywhere in the HF bands. Nor is there presently a segmentation of the data and RTTY subbands by bandwidth of data emissions. The only bandwidth limit on data emissions in the subbands where data is permitted in the present

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<sup>5</sup> Some opponents equate spectrum efficiency with narrow bandwidths. Spectrum efficiency is also achieved through greater data throughput, thus permitting shorter periods of spectrum occupancy.

<sup>6</sup> See, the Petition, at paragraph 9.

<sup>7</sup> Section 97.1 of the Commission's rules obligates Amateur Radio licensees to continue and extend "the amateur's proven ability to contribute to the advancement of the radio art" and to advance "skills in both the communications and technical phases of the art."

<sup>8</sup> Some opposing comments argued that the Petition is motivated by an effort to promote Winlink2000 using PACTOR 3 and PACTOR 4 data emissions. They claim that Winlink2000 is deployed now in unattended configurations, resulting in interference to ongoing CW and other communications in the MF and HF data subbands.

<sup>9</sup> It is illogical to argue on the one hand that the Petition is intended to benefit "the few" who are data emission experimenters and users, and on the other hand to predict that the relief requested in the Petition would create a flood of "wide-bandwidth" data emissions swamping the band segments used for CW, RTTY and narrow-bandwidth data emissions.

rules (because symbol rate is no longer a determinant of occupied bandwidth) are the conditions that the station transmission shall occupy no more bandwidth than necessary for the information rate and emission type being transmitted,<sup>10</sup> and that emissions resulting from modulation must be confined to the band or segment available to the control operator.<sup>11</sup> So what is new here? ARRL proposes to delete the symbol rate restriction and enact a maximum bandwidth limit where none exists in the rules now. Nothing about this justifies the conclusion that data stations will overwhelm the data/RTTY subbands if the proposal is enacted. If the concern is that the rule changes proposed by ARRL will encourage more radio Amateurs to experiment with data emissions, that would be a positive outcome. It is absolutely the intention of this Petition to facilitate increased experimentation with data emissions and to eliminate artificial regulatory barriers to such experimentation. There is no evidence that such an outcome, no matter how successful, will result in any compromise of CW, RTTY and narrow bandwidth data emissions to any greater extent than do the current rules. Quite the contrary is true: at the present time it is permissible to use multiple carriers, each with multiple-bit-per-symbol modulation, necessitating large occupied bandwidths. The limit on data emission bandwidth proposed in the Petition would preclude that practice.

5. The opposition comments contain anecdotal reports of Amateur stations transmitting data communications on frequencies occupied by CW, RTTY or narrow-bandwidth data communications, and allegations that Winlink2000 stations that are unattended while transmitting PACTOR-3 emissions routinely disrupt ongoing communications in the RTTY/data subbands at HF. Even if these examples were verified and quantified, and even if the alleged problems were widespread in the HF bands, these incidents would not justify retaining the

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<sup>10</sup> See 47 C.F.R. § 97.307(a).

<sup>11</sup> See 47 C.F.R. § 97.307(b).

symbol rate restriction as a means of limiting data emissions in the HF bands. The reason for band plans in the HF bands is that the HF bands are limited and there should be cooperative accommodation for all types of operation. If there is a failure in this respect, it should be solved without reference to outdated Commission rules. Likewise, if there are abuses of the Commission's Section 97.221 rules regarding automatically controlled data stations resulting in ongoing interference, those should be referred to the Commission as enforcement matters.

6. Some opposing comments claim that the Petition will permit automatically controlled stations throughout the HF spectrum where narrowband emissions are now conducted. It is important to reiterate that nothing in the ARRL petition would change the rules regarding automatically controlled data emissions at MF or HF. Any automatically controlled data communications at MF or HF are limited as follows: (1) they must operate within nine very narrow specific HF subbands;<sup>12</sup> **or** (2) they may operate on any other frequency within the RTTY/data subband,<sup>13</sup> if, and only if, they transmit only in response to interrogation by a station under local or remote control, and if they utilize an occupied bandwidth no greater than 500 hertz.<sup>14</sup> The fear of interference from automatically controlled stations as the result of this Petition is not a valid one.

7. Some opponents of the Petition suggest that there should be regulatory segregation between wider bandwidth data emissions and narrower bandwidth data, RTTY and CW emissions; and that 2.8 kilohertz bandwidth data emissions are too wide to be permitted generally in the MF and HF RTTY/data subbands. They argue that data emissions at 2.8 kilohertz bandwidth should be restricted to the HF band segments where phone and image communications are permitted. Those arguments suggest a complete reordering of the regulatory

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<sup>12</sup> See 47 C.F.R. § 97.221(b).

<sup>13</sup> See 47 C.F.R. § 97.305(c).

<sup>14</sup> See 47 C.F.R. § 97.221(c).

scheme for the HF bands, and are in fact suggesting a comprehensive “regulation by bandwidth” plan for the HF bands. ARRL’s instant Petition is quite distinct from this concept. The suggestion that certain types of data emissions should be segregated from narrow bandwidth data, RTTY and CW is far beyond the scope of this proceeding. ARRL’s Petition, rather than seeking to reorder the segmentation of the HF bands by bandwidth, simply proposes to permit a wider array of data emissions in the HF bands than are permitted now, by removing a single outdated and arbitrary regulatory limitation. The subject of regulation of the HF bands by bandwidth rather than emission type is a far broader and more complicated topic which should be addressed, *if* and when appropriate, in a separate proceeding.

8. ARRL’s Petition noted that one precedent for the proposed 2.8 kilohertz bandwidth maximum for HF data emissions and for elimination of the symbol rate limit was the fact that the 60-meter channel bandwidths were 2.8 kilohertz wide, and that there was no symbol rate limit for data emissions on those channels. Opponents of the Petition assert correctly that the 60-meter channels are unique because the channelization scheme there, necessitated by the need for compatible sharing of the band with primary government users, is not found in any other MF or HF band. They argue that therefore, the bandwidth of the 60-meter channels cannot serve as a model for appropriate data bandwidth in the other HF bands. While it is correct that the fact of the 2.8 kilohertz bandwidths of each of the five, 60-meter channels is not a stand-alone justification for the proposed maximum occupied bandwidth for data emissions in other, non-channelized MF and HF bands, the point ARRL was making in the Petition was somewhat different. It was this: Because there is no symbol rate limit for data emissions in the 60-meter channels, but instead only a bandwidth limit (i.e. the channel bandwidth in the 60-meter case) that regulatory scheme serves as a precedent for the concept of elimination of the symbol rate

limit and for the reliance only on a bandwidth maximum for data emissions instead. ARRL was not arguing that the 2.8 kilohertz bandwidth maximum was, by itself, justified by the channel bandwidths of the five 60-meter channels. The selection of a particular proposed maximum bandwidth was premised on an effort to accommodate three, equally important requirements simultaneously: (1) continuing to permit all data emissions that are permitted and in constructive use now; (2) encouraging additional experimentation with data emissions that is prohibited now because of the symbol rate limitation; and (3) precluding the use of data emissions in the HF RTTY/data subbands that would utilize too large an occupied bandwidth and thus usurp the limited spectrum available. Because of this last goal, ARRL disagrees with the commenters who urge the elimination of the symbol rate limit *without* adding *any* bandwidth limitation. There must be some limit on occupied bandwidth for data emissions at MF and HF. ARRL's proposed 2.8 kilohertz proposal is therefore a balanced approach. Accomplishing the above goals simultaneously does not allow much flexibility in the specification of a maximum bandwidth: The range of reasonable alternatives extends from about 2.5 kilohertz to about 3 kilohertz. The counterproposals contained in some opposing comments of a 1 kilohertz or a 2.2 kilohertz limit are intended to preclude most data emissions at MF and HF. They are therefore unreasonable on their face, in light of the Commission's recent conclusion that it is undesirable to prohibit emissions that are currently permitted.

9. Some suggest that the Petition is not justified because high-speed data is not necessary for emergency communications; or that the Petition is not justified because data experimentation can occur in the VHF and higher frequency bands; or that the Petition is not justified because the rules currently permit sufficient data experimentation and that the evidence of that is in some unspecified developments in data communications accomplished by radio Amateurs. The

response to all of these arguments is basically the same: this Petition is not a referendum on the value of MF or HF data emissions or data experimentation in those bands. The rules now permit some MF and HF data emissions but experimentation with those modes is artificially restricted by outdated rules. It is useful to provide a regulatory environment that encourages experimentation in all portions of the radio spectrum and to use and adapt data emissions that further the radio art. ARRL's Petition noted some potential emergency communications and government interoperability applications of data emissions that are not now permitted by the Part 97 rules due exclusively to the symbol rate limitation, but the basic purpose of the Petition is not to facilitate emergency communications or interoperability with United States government stations in the event of disasters. It is instead a proposal to delete outdated limitations on Amateur Radio experimentation, which Commission policy supports, and which the basis and purpose of the Amateur Radio Service necessitates.

10. The last major argument echoed in several of the opposing comments is that encouraging the use of new data emissions limits the ability of radio Amateurs to self-regulate the MF and HF bands because it limits monitorability of those emissions. The Commission's rule governing specified digital codes at MF and HF, Section 97.309 would be unchanged by this Petition. The requirement of publication of the specifications of a digital emission has not been found to be insufficient to date in terms of monitorability of data communications or to permit enforcement of the rules regarding the content or form of data communications. The public documentation requirement for data emissions at MF and HF resulted from an *Order*, DA 95-2106, released October 11, 1995, in which the Commission approved the use of CLOVER, G-TOR and PACTOR digital codes. In that proceeding, the Commission said that the primary purpose of those digital modes was to facilitate communications using already authorized digital

codes, emission types, and frequency bands. It noted that the technical characteristics of those modes had been documented publicly for use by Amateurs, and as such there was not a significant issue with respect to enforcement. Since that time, the Commission's rules have permitted the use of specified digital codes in the MF and HF bands. Nothing in the ARRL Petition would change the rules regarding the use of specified digital codes or the public documentation requirement for those permitted emissions.

11. ARRL continues to support its Petition without reservation. Elimination of outdated regulations and the enactment of a balanced plan to preclude unreasonably wide bandwidth data emissions in the MF and HF subbands where RTTY and data are now permitted is undoubtedly in the best interests of the Amateur Service and will better enable radio Amateurs to fulfill the obligation of the Service to continue and extend "the amateur's proven ability to contribute to the advancement of the radio art" and to advance "skills in both the communications and technical phases of the art."

Therefore, the foregoing considered, ARRL, the national association for Amateur Radio, again respectfully requests that the Commission grant the relief requested in the Petition and

modify the rules as per the revised *Appendix* tendered with ARRL's *Erratum* filed in this proceeding.

Respectfully submitted,

**ARRL, the national association for Amateur Radio**

225 Main Street  
Newington, CT 06111-1494

By: Christopher D. Imlay  
Christopher D. Imlay  
Its General Counsel

Booth, Freret, Imlay & Tepper, P.C.  
14356 Cape May Road  
Silver Spring, MD 20904-6011  
(301) 384-5525

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