In the Matter of:)
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The Amendment of Part 97 of the   )
Commission's Amateur Radio   )
Service Rules to Reduce Interference and   )
Add Transparency to Digital Data   )
Communications   )   RM-11831
)
)
)
To**:**   The Chief, Wireless   )
          Telecommunications Bureau   )
)
_____   )

SUPPORTING COMMENTS

I am pleased to offer my Comments in Support of the above captioned proceeding.

1.   Background and Basis for Rulemaking

RM-11831, if adopted, will ensure the ability to identify and monitor the radio transmissions of any data signal using readily available over-the-air interception methods by third parties as is required now by Amateur Radio Service regulations.[1]

Without open, over-the-air interception capability for all transmissions in the amateur radio high frequency (HF) spectrum, there is _no way_ to determine if there is commercial, or other prohibited, inappropriate content in ongoing communications over the amateur radio spectrum.[2] Users of the Amateur Radio Safety Foundation, Inc., (ARSFI/Winlink) bulk email and data transfer system even go so far as to _brag_ in one of their "RMS Express" Tutorials that its digital content is almost _impossible to intercept_, making it essentially encrypted.[3] RM-11831

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[1] 47CFR §97.113(a)4 and §97.119(a).

[2] See FCC DA 13-1918 ¶6.0

[3] See http://www.la3f.no/faste/digi/winlink/ExpressTutorial1130a.pdf Section II (C), page 3. "Security."

will help ensure that hams and the public will be able to self-police all data transmissions *as they happen in real-time*, helping protect our national security over the public airwaves, and minimize the cost and burden on the Commission's Enforcement Bureau.

RM-11831 will <u>assure</u> that the Amateur Radio Service will not be used to bypass commercial Internet or email services or be used for commercial use.[4] ARFSI/Winlink, although a not-for-profit entity, *is still a commercial entity* that offers a service. It asks for an annual "contribution" from users in order to assist in funding its system and interconnections to the Amateur Radio Service. Alternatively, there are many satellite-based Internet Service Providers[5] and ground-based wireless Internet connection methods offered by cellular network common-carriers[6] that are fee-based and do not require use of amateur radio spectrum. A fee-based service virtually identical to ARSFI/Winlink is available for mariners on international HF maritime frequencies.[7]

RM-11831 *will not affect digital voice codes* such as DStar, Fusion, DMR, MOTOTRBO, and APCO P25 as they are clearly decodable via radio hardware and software and are released for open public decoding and use.

2. <u>RM-11831 Will Solve the Long-Standing Interference Problem</u>

Eliminating Part 97.221(c), as RM-11831 proposes, would solve long standing interference issues suffered by radio amateurs wishing to use the HF Radioteletype (RTTY) and Data sub bands for other mainstream and emerging digital modes. Automatically Controlled Digital Station (ACDS) traffic is primarily set up for bulk data throughput purposes.[8] Most new and emerging digital codes are very narrow-bandwidth and depend upon finding adequate clear spectrum to effectively communicate. Spectrum that is not subject to sudden "blasts" of expanding Orthogonal Frequency Division Multiplex (OFDM) subcarrier signals often used by ACDS stations that expand bandwidth dynamically, if propagation conditions merit doing so.[9]

3. <u>No Setbacks for Emergency Communications</u>

Nothing in RM-11831 will hamper or remove the ham radio emergency communications (EMCOMM) capabilities of store-and-forward data. Rather, the petition merely reaffirms that such ACDS transmissions remain in *already-allocated* digital sub bands given to them by the

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[4] 47CFR §97.1, §97.3(a)4, and §97.113(a)5.

[5] For example, Hughes Net, *Inmarsat PLC* and *Iridium™*

[6] AT&T, Verizon and others

[7] *Sailmail* ™

[8] Most all ACDS traffic is either commercial Internet-derived Email or stored file content.

[9] A characteristic of PacTORs 2, 3 and perhaps VARA and other multi-subcarrier OFDM modes

Commission; so they don't interfere with adjacent communications. It also requires that they use open, over-the-air transmissions that all can monitor. Both of these concepts are already part of Commission amateur rules. RM-11831 simply *reaffirms them more clearly and distinctly,* as they are basic tenets that are being ignored now by some operators. It also serves to encourage adoption of new, openly decodable specified codes via a universal definition of *what is acceptable for use and what is not*.

The effective encryption of message traffic serves to actually hamper the effective transfer of what just might be lifesaving information in a real crisis. The nature of HF propagation isn't all that reliable. Hit or miss is a good way to describe the ability to use a given frequency or even several bands of frequencies at a given time as natural factors change and can limit the ability of signals to get from a desired "point A" to a desired "point B."

Through the years, amateurs have made do with these conditions by creating ad hoc networks of stations who all listen for important message traffic and act as relays to get the important messages through, in correct form, in the event that the desired points are not able to contact one another directly. Over-the-air interception by the public or *any* amateur radio operator is especially needed for EMCOMM situations such that as many people (or at least one more person) could learn of the danger by listening-in and responding in real time.[10]   Reliance on an ACDS commercial system like ARSFI/Winlink during actual emergencies could create an "Achilles Heel" that might just fail to get messages through as amateur radio always has, *when all else fails.*

4.   Automatic Resend Request Techniques Must Be Limited

The use of proprietary software coding through designated, interlocking automatic stations does not have the *failsafe delivery feature* of 3rd party reception and relay. Especially, if two stations link up using a type of automatic resend technique called Automatic Repeat Query (ARQ), as is in commonplace use now with ARSFI/Winlink. Exchanges simply cannot, in most cases, be monitored, corrected and, if necessary, repeated by others who might be listening in order to spread the word and help get the information where it needs to go expeditiously. Character or word parsing done by software, often called "compression," makes the content undecipherable to a 3rd party listener. This is widely known and advertised as a *desirable* feature by ARSFI/Winlink users.[11] Essentially, it's an admission that the content is *effectively encrypted*. *If complete text strings are not resent in their entirety and legibly, the particular ARQ and compression*

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[10] See FCC DA 13-1918 for why open communication *has been and must always be* a requirement in ham radio; and why privacy is never allowed, even in EMCOMM communications.
[11] See https://ema.arrl.org/ares/winlink-2000/

techniques should be prohibited.[12] Steve Waterman, K4CJX, one of the founders of ARSFI/Winlink, claims [that] "*Those who complain that they cannot copy certain protocols must only have the correct hardware and software to do so. ……and… those who complain about not being able to monitor an open compressed binary format only need the right equipment and software. This emphasis on intent, as opposed to any incidental effect on ease of monitoring by third parties, is crucial.*[13]" Yes, the emphasis should be on intent and knowledge. It is widely known and included in their own instructional literature that ARSFI/Winlink content is *virtually impossible* to decode by 3rd parties over the air. In so doing they imply that its obscured nature is *not just incidental, but a useful and desirable property*. If that's not *an invitation to use the characteristic to one's advantage*, *should the need arise*, then I don't know what else one could call it. Apparently, the needed 3rd party software and hardware Waterman refers us to is unheard of; at least to those ARSFI/Winlink user experts who write their instructional literature.

If ARQ or other advanced digital communication methods are to be used in ham radio, RM-11831 simply reiterates the *basic and fair expectation* that has always served the Amateur Radio Service. That is: Any such new digital data advancement would simply be required to also provide an open-source or readily-decodable solution for the public, in order to maintain the openness and transparency required in the Amateur Radio Service at frequencies below 50 MHz.[14] This principal has been followed properly by many advanced digital data transmission techniques such as D-Star, DMR, Fusion, FT-8, and many others. But, unfortunately, not by ARSFI/Winlink with its use of the proprietary PacTORs 2 and 3; or in its use of other digital codes that ARSFI/Winlink develops and uses with ARQ. It is widely known and understood that content *can readily be observed by 3rd parties while in "broadcast," or Forward Error Correction (FEC) mode*. Quite simply stated, at the very least, *FEC should replace ARQ* in HF amateur data communications.

5. Renewing and Stimulating Interest in the Amateur Service

RM-11831 will help the public engage and take interest in data communications; and it will attract more youth to the hobby who will gain interest in open source data communications – vital for STEM education and the country's economic future. Just like how AM shortwave listening motivated a generation of us older folk in the 1950's and '60s. The incentive to be able

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[12] An example of a resend request technique that actually *does* send complete, intelligible text strings is that employed by original X.25 Packet. If the received text string does not match the sent checksum, then a request to resend the entire string is transmitted back by the receiving station, making the content perhaps repetitive to a 3rd party listener, but not unintelligible.

[13] See Waterman Addendum to Comments RM-11708, ¶ 5
https://ecfsapi.fcc.gov/file/101154248792/Addendum_RM11708_16-239.pdf

[14] See Table at 47CFR §97.305(c) and 47CFR §307(f)3 and 4.

to "read the mail" using a personal computer and simple dongle-connected software-defined receiver will stimulate the technical curiosity that is now waning; and ensure that amateur radio has more than just Community Emergency Response Teams (CERT)[15] as a motivation to interest newcomers.

The gift of the Amateur Service here in the US is akin to our network of National Parks and Forests. A "commons" set aside for the public benefit, that must be treated with respect and kept open to encourage collegiality and the growth of electronics expertise in America. The social contract that ham radio and its licensees make with the government and our society at large is that in exchange for the gift of spectrum, we promise to treat it well; to conserve and take care of it; to monitor and self-police it for proper use; and to share it with others around the globe. The basic tenets of ham radio are built upon this social contract of openness and sharing of anything we do; *with no expectation of privacy or financial gain*. RM-11831 ensures that the social contract and integrity of our amateur spectrum will be maintained, for the good of our country's future.

Therefore, I respectfully request that the Commission issue a Notice of Proposed Rule Making at an early date, to delete Section 97.221(c), and modify Section 97.309(a)(4) of the Commission's rules as described above. Also, WTB-16-239, RM-11708, RM-11759, and RM-11828 should be *Dismissed* until a decision is reached on the fundamental issues that are the core of this Petition.

Respectfully Submitted,

/s/

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April 8, 2019

 Cc Filings:
WTB 16-239
WT-RM-11708
CG-RM-11759
CG-RM-11828

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[15] The **CERT** program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations.