SCS GmbH & Co. KG Röntgenstraße 36 D-63454 Hanau

Via ECFS
Marlene H. Dortch
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

SCS - Spezielle Communications Systeme GmbH & Co. KG
Röntgenstraße 36
D-63454 Hanau

Phone: +49 (0) 61 81 / 85 00 00
Fax: +49 (0) 61 81 / 99 02 38
info@scs-ptc.com
www.scs-ptc.com

July 29, 2019

Reply Comment, RM-11831,
in response to ex parte letter, dated July 24, 2019, by Theodore S. Rappaport, N9NB, Michael J. Marcus, N3JMM, Ari Q. Fitzgerald, and John W. Castle, on behalf of NYU,
by Hans-Peter Helfert, DL6MAA,
c/o Spezielle Communications Systeme GmbH & Co. KG, Germany

Dear Ms. Dortch,

As has already been made clear[1,2], the term "effective encryption" is not defined in information theory or in FCC rules, but a creation of Prof. Rappaport. The accusation that Winlink would use "effective encryption" to intentionally obscure the meaning of emails being sent is baseless.

Winlink uses data compression, i.e. the size of an e-mail is reduced by the open-source LZH algorithm by a significant factor before transmission, and then the e-mail is sent in this squeezed form over the RF channel. While section 97.113(a)(4) prohibits "messages encoded for the purpose of obscuring their meaning", using data compression has the purpose and intent of saving occupied bandwidth and time of transmission. It is the state-of-the-art of digital communications, which optimizes the least time and bandwidth in a narrow and crowded spectrum. It is definitely not encryption.

Compressing the payload as a whole makes it relatively difficult to monitor the data on a "fading RF channel." The listener has to first read the entire compressed file to be able to

[1] https://ecfsapi.fcc.gov/file/10512224804129/SCS_FCC_Reply_RM11831.pdf

[2] https://ecfsapi.fcc.gov/file/10513525129724/rm11831-rebuttal-to-rappaport.pdf

successfully carry out decompression. Even a quite normal shortwave channel[3] with only two parallel propagation paths with Rayleigh fading and a Doppler spread of 0.5 Hz will cause considerable SNR fluctuations[4] during a few minutes long message. Only successful decompression processing after receiving the entire file returns readable text. Reading incoming fragments of a Winlink e-mail during reception (i.e. contents of single data packets) makes little sense to the listener at first. You cannot just "look inside" during a Winlink transmission and see readable parts. Monitoring compressed file transfers is thus more complicated than, for example, listening to SSB voice content, or even popular point-to-multipoint digital modes.

Of course, this obstacle exists in exactly the same way if other HF modem protocols than PACTOR 3 or PACTOR 4 were used as a transmission medium (OSI[5] layers 1 and 2) such as VARA, ARDOP, WINMOR or even PACTOR 1 and other "public domain" protocols. The demand for "open source" absolutely does not change the readability of compressed Winlink messages in principle. All other statements in this regard are false and misleading.
If you need a hardware or a software modem for monitoring, is a practical issue but not a fundamental difference, requiring a legislative change – as proposed by RM-11831 proponents.

The entire "on-air monitoring" challenge raised by Prof. Rappaport in reality is about whether presently legal data compression (file compression) on "fading RF channels" in amateur radio is permissible or should be outlawed. It is not at all about which OSI layer 1 or layer 2 protocols (whether PACTOR, VARA, "open source", ARQ[6] or broadcast FEC) are used for this, because this does absolutely not change the readability of the data by third parties in principle when file compression is applied. A "fading RF channel" generates inherent obstacles to monitoring of whole files that cannot be influenced by changes in the law, whether the transport layer is a point-to-point or point-to-multipoint radio mode.

In our opinion, a ban on compression techniques would be a major step backwards in technology and would have no relation to the gain in "transparency". It would also significantly increase the time of transmission for most messages sent.

---

[3] On ITU standard HF channels:
https://www.itu.int/dms_pubrec/itu-r/rec/f/R-REC-F.1487-0-200005-I!!PDF-E.pdf

[4] SNR fluctuations on a Rayleigh fading channel:
https://en.wikipedia.org/wiki/Rayleigh_fading#/media/File:Rayleigh_fading_doppler_10Hz.svg

[5] OSI model of a communications system:
https://en.wikipedia.org/wiki/OSI_model

[6] The only difference between ARQ and broadcast in this respect is the possibly varying SNR threshold on ARQ because of available sub-mode adaptation during a transmission.

We are astonished that such a prestigious educational institution as the NYU misinterprets these simple, well-known and commonly taught relationships. We respectfully ask their false and misleading information that discriminates against PACTOR 3 and PACTOR 4 not be taken into account when deciding on RM-11831.

Respectfully,

Hans-Peter Helfert
SCS GmbH & Co.KG

cc:

Eric Burger Eric.Burger@fcc.gov
Lisa Fowlkes Lisa.Fowlkes@fcc.gov
Ajit Pai Ajit.Pai@fcc.gov
Geoffrey Starks geoffrey.starks@fcc.gov
Michael O'Rielly mike.o'rielly@fcc.gov
Jessica Rosenworcel Jessica.Rosenworcel@fcc.gov
Rachael Bender Rachael.Bender @ fcc.go v
Zenji Nakazawa Zenji.Nakazawa@fcc.gov
Michael Wilhelm Michael.Wilhelm@fcc.gov
Curt Bartholomew Curt.Bartholomew@fcc.gov
Erin McGrath Erin.McGrath@fcc.gov
Brendan Carr Brendan.Carr@fcc.gov
Julius Knapp Julius.Knapp@fcc.gov
Michael Ha michael.ha@fcc.gov
Ronald Repasi Ronald.Repasi@fcc.gov
Bruce Jacobs Bruce.Jacobs@fcc.gov
Donald Stockdale Donald.Stockdale@fcc.gov
Roger Noel Roger.Noel@fcc.gov
Scot Stone Scot.Stone@fcc.gov
Rosemary Harold Rosemary.Harold@fcc.gov
Charles Cooper charles.cooper@fcc.gov
Laura Smith Laura.Smith@fcc.gov