

ROBERT J. BUTLER
HARRY F. COLE
ANNE GOODWIN CRUMP
DONALD J. EVANS
PAUL J. FELDMAN
KEVIN M. GOLDBERG
DAVID M. JANET
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ASHLEY LUDLOW
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HARRY C. MARTIN
MICHELLE A. McCLURE
MATTHEW H. McCORMICK
FRANCISCO R. MONTERO
RAYMOND J. QUIANZON
DAVINA SASHKIN
PETER TANNENWALD
JAMES U. TROUP
KATHLEEN VICTORY

1300 NORTH 17th STREET, 11th FLOOR
ARLINGTON, VIRGINIA 22209

OFFICE: (703) 812-0400
FAX: (703) 812-0486
www.fhhlaw.com
www.commlawblog.com

RETIRED MEMBERS
VINCENT J. CURTIS, JR.
RICHARD HILDRETH
GEORGE PETRUTSAS
JAMES P. RILEY

OF COUNSEL
THOMAS J. DOUGHERTY, JR.
ROBERT M. GURSS*
KATHRYN A. KLEIMAN
MITCHELL LAZARUS
ROBERT J. SCHILL
LAURA A. STEFANI
ROBERT M. WINTERINGHAM

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LAURA STEFANI
(703) 812-0450
STEFANI@FHHLAW.COM

* NOT ADMITTED IN VIRGINIA

Via Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: IB Docket No. 13-213 and RM-11685
Ex Parte Filing of the Hearing Industries Association

Dear Ms. Dortch:

The undersigned and Stephen Berger, technical consultant to the Hearing Industries Association (“HIA”), met on April 19, 2016, with Jose Albuquerque, Karl Kensinger and Merissa Velez of the Satellite Division of the International Bureau, and on April 20, 2016 with Julius Knapp, Ronald Repasi and Mark Settle of the Office of Engineering and Technology. The following points were made regarding GlobalStar’s rulemaking request and the impact of the proposed TLPS system on hearing aids that use Bluetooth Low Energy (“Bluetooth LE”) and similar low power technologies.

The future of hearing aids (as well as most other FDA-regulated wireless medical devices) is in the 2.4 GHz band. Bluetooth Low Energy (“LE”) provides a compelling and multi-dimensional value-proposition that meets the needs of devices that must be small and are subject to battery constraints (*i.e.* are always on, are lightweight, and share a common protocol), allowing communication with smartphones and products from other industries, and with sufficiently broad usage to create an ecosystem with the necessary chips, components and product development support for efficient product development. Another reason manufactures

are moving to the 2.4 GHz band is to enable coupling with other wireless devices, notably smartphones and tablets. The public benefits of this are enormous: direct coupling with wireless handsets will allow for improved connections, may eliminate certain FCC requirements for wireless handsets such as hearing aid compatibility, and will allow people with hearing loss who use hearing aids to access new technologies as quickly and easily as other Americans.

The forthcoming Bluetooth LE standard for hearing aids, as well as the “greying of America,” means that millions of new hearing aids will come into use on the 2.4 GHz band. (Other Wi-Fi bands (*i.e.*, 5 GHz and above) are not suitable for hearing instruments.) Meanwhile, GlobalStar is seeking to build a network that will operate in the “safe harbor” portion of the band in the very locations where people who use hearing aids need to most rely upon them – in offices, universities, conference centers, airports, etc.

Technical demonstrations do not address one of HIA’s major concerns – the availability of Bluetooth LE advertising channels.¹ Unlike standard Bluetooth devices omnipresent today, Bluetooth LE has protocols that require two devices to access one of three advertising channels to sync their frequency hopping. If this does not occur (because these channels are in use), connection does not occur and the devices (Bluetooth LE hearing aids) are not operable. Two of the advertising channels are located on either side of Wi-Fi Channel 1, and when that channel is highly congested, the out-of-band emissions from Wi-Fi devices can block use of the advertising channels. The third channel is located well within Channel 14, where GlobalStar seeks to operate. GlobalStar’s higher power operations will impede access to the channel by Bluetooth LE devices when the technologies are in close proximity. Absent a means to access this channel, such as by defined time sharing, Bluetooth LE devices will not operate.

Given these factors, the correct path forward should not be to allow GlobalStar conditional authority for limited operation. This is especially true if that authority would place the burden on other users to find and demonstrate harmful interference from TLPS. Consumers, and especially people who use hearing aids, cannot be expected to have the sophistication to determine that they are experiencing interference from TLPS. Instead, this should be done by someone with an understanding of the complex and specific needs of hearing aid users (*i.e.*, psychoacoustics). People with hearing loss have lost the ability to hear soft sounds and dynamic range and are much more sensitive to speech cues, so a determination of the impact on hearing aids must be done by someone trained in these issues. And, any means of resolving harmful

¹ We have seen statements from GlobalStar that TLPS will transmit on a 22 MHz channel. A 22 MHz channel is representative of 802.11b, which has a maximum data rate of 11 MBs. However, the demonstrations from GlobalStar report higher rate rates, suggesting that TLPS will use 802.11n or 802.11ac, which have 20 MHz wide channels, but allow 40 MHz and 80 MHz channels. Should the Commission grant GlobalStar’s request, it should specify limits on channel bandwidth, along with transmit power and out-of-channel emissions, so that other users of the band know what to expect, allowing successful sharing to occur.

interference must occur in milliseconds, not hours or days. A hearing aid user attempting to make a 911 call cannot wait.

Rather, the path forward is to have specific information in the record regarding the technical specifications of the TLPS that actually will operate, such as bandwidth, limit on channel bandwidth, duty cycle, modulation, and the specific 802.11 standard the system will use. With this information, engineers can model the potential impact on Bluetooth LE (and similar low power technologies), and make useful suggestions as to the service rules under which GlobalStar could operate with minimal impact to Bluetooth LE and other users of the band.²

Questions were raised regarding the use of Channel 14 in other countries. This is not directly analogous, because Wi-Fi operations on that channel in other countries occur under different rules and standards. In some countries, only 802.11b is allowed, but the newer versions of 802.11 are not. Compared to the US, in Europe relatively low power Wi-Fi is used, and high power transmitters and repeaters are not allowed. Routers are set for around 14 dBm, compared to similar models in the US which are often more than 20 dBm.³ However, even with these differences in Europe, both ETSI and the EC have taken steps to modify the operating rules for Wi-Fi in response to interference problems. In particular, new versions of the ETSI standards add significant spectrum sharing requirements.

Please direct any questions to the undersigned.

Respectfully submitted,



Laura A. Stefani
Counsel for The Hearing Industries Association

² A low cost means by which other users can understand the potential new operating environment with TLPS is the open source GNURadio project, which already has code for Wi-Fi. If GlobalStar confirms whether TLPS will use an 802.11b, 22 MHz wide DSS transmission (or an 802.11ac, 20 MHz wide OFDM transmission, or alternates between them based on signal conditions or other factors) and also specifies the limits of transmit power and out-of-channel emission (into 2.4 GHz band), then others could understand the potential impact over the range of transmit powers and out of channel emissions that could occur.

³ The most recent versions of the ETSI standard and EN limit devices to less than 20 dBm. In addition, architectural propagation losses in Europe tend to be greater due to thicker walls and more RF absorbing materials being used.

cc: Edward Smith
Louis Peraertz
Johanna Thomas
Brendan Carr
Erin McGrath
Julius Knapp
Ron Repasi
Mark Settle
Mindel De La Torre
Jose Albuquerque
Karl Kensinger
Merissa Velez