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Shure's Comments to

ACMA's Consultation paper on "Proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands"

Shure Incorporated welcomes the opportunity to comment on ACMA's above-mentioned consultation.

For 97 years, Shure has been a leading manufacturer of high-quality, innovative audio products based in the United States. Shure products (www.shure.com) are utilized worldwide in applications known as audio Programme Making & Special Events (PMSE[1] also known as SAB/SAP[2]), which includes deployments in industries such as broadcast and film production and other professional indoor and outdoor media content creation, in addition to a variety of other civic, business, and special event contexts. These applications continue to grow annually in scale and density to meet the needs of broadcast (incl. streaming) and event producers engaged in increasingly complex productions to meet audience expectations.

PMSE can be considered the "pen and pencil" of the content production industry which includes web, theatre, adverts, films, sports, concerts and cultural events as emphasized in this video. This is particularly relevant for Australia which has a flourishing media industry, which includes the cinema and film industry.[3] Today, it is virtually impossible to produce creative content without PMSE. Audio is of prime importance in the world of PMSE. Without the "audio" part of an event, CEOs, politicians, and entertainers cannot communicate with impact to their audience. Ultra-High Definition (UHD) video would be of little interest without high quality sound to accompany it.

[1] PMSE is the ITU's inclusive term consisting of radio microphones, in-ear monitors, wireless cameras, talkback systems, etc

[2] Services Ancillary to Broadcasting (SAB)/Services Ancillary to Programme making (SAP)

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The TV-UHF band is and will likely remain the primary global spectrum band for audio PMSE operation. It has been successfully shared with television broadcasting services for many years on a cooperative basis. For technical reasons, UHF spectrum is uniquely suited and vitally important to the operation of these devices. That being said, other bands are used by PMSE such as the 1.9 GHz band and other bands are being explored to complement the on-going loss of spectrum in the TV-UHF band.

The reason why most of today's audio PMSE devices are based on proprietary transmission schemes is the need to meet the following extensive requirements simultaneously and during the whole operating period:

- Ultra-low latency
- Very high transmission reliability
- Very high audio quality
- High spectrum efficiency

Innovations in audio PMSE technology are happening to make more efficient use of spectrum but these advances cannot completely make up for any lack of spectrum. One such technology is the Wireless Multi-Channel Audio System (WMAS)[9]. **Technology neutral rules would allow deployment of WMAS in addition to 3GPP-based 5G technologies in 3.8-4.0 GHz band for example, if indeed.**

Shure is very careful when it comes to the assertions made about the potential applicability of 5G technology for audio PMSE applications as various publications on the subject show.[4] Indeed, at the present time, the feasibility of integrating audio PMSE applications into 5G is unproven and undefined on either a technology or economic basis. It, therefore, cannot be considered as a viable solution for audio PMSE in the

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4 [1]: Guirao M., Wilzeck A., Schmidt A., Septinus K., Thein C.: "Locally and Temporary Shared Spectrum as Opportunity for Vertical Sectors in 5G", IEEE Network (Volume 31, Issue 6, 2017)

[2]: Pilz J., Holfeld B., Schmidt A., Septinus K.: "Professional Live Audio Production – A highly synchronized 5G URLLC Use-Case", IEEE Network (Volume 32, Issue 2, 2018)

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foreseeable future. That said, Shure and other audio PMSE stakeholders are exploring the potential development of audio PMSE technologies based on 5G and taking part in various industry efforts like, e.g., the 5G-Media Action Group (5G-MAG) which is exploring Non-Public 5G Networks (NPNs) covering studios and other venues for Content Production.[5] Bands like 3.8-4.0 GHz would enable such 5G NPNs.

This is why we support ACMA's proposal to develop arrangements for restricted cell local-area wireless broadband (LA WBB) use in the 3800-4000 MHz frequency range in metropolitan areas and other areas of high demand via the issue of area-wide apparatus licences (AWLs).

Please contact the undersigned if you have any questions.

Respectfully submitted,
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[5] https://www.5g-mag.com/post/non-public-5g-networks-for-content-production