



16 December 2022

Shure's Comments to **ACMA's Consultation paper on "Variations to the Low Interference Potential Device Class License"**

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 (PMSE¹ also known as SAB/SAP²), 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.

General comments

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

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)



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.

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



Comments to Questions 4 – 8 on WMAS technologies for wireless audio transmitters

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).

Question 4

What should be the maximum EIRP for WMAS devices in the 520–694 MHz and 1785–1800 MHz bands?

We suggest allowing an RF power of 22.15 dBm EIRP (100mW ERP), while we note that some applications do request higher RF output power of e.g., 250 mW ERP. The higher RF output power request for those special events / applications could be granted by a special license.

Shure has been heavily involved in WMAS standardization and regulation globally. Shure is collaborating with different partners to improve spectrum efficiency while protecting other existing services and applications including existing narrowband wireless audio systems.

Together with the US National Association of Broadcasters (NAB) and Paramount, a common proposal was developed suggesting 100 mW ERP for unlicensed operation and 250 mW ERP for licensed operation.⁴ Shure expects the US spectrum regulator, Federal Communications Commission (FCC), to issue its regulations for WMAS in various spectrum bands in the first quarter of 2023.⁵

Question 5

Should a maximum bandwidth limitation be implemented for WMAS devices? If

⁴ <https://www.fcc.gov/ecfs/search/search-filings/filing/1103105988603>

⁵ <https://www.fcc.gov/document/fcc-looks-open-door-new-wireless-microphone-technologies-0>



so, what should the maximum emission bandwidth be?

Today, ETSI EN 300 422-1⁶ limits WMAS bandwidth to 20 MHz and specifies a transmission mask that scales with the bandwidth. Therefore, every value below 20 MHz is also addressed in that standard and should be available for use.

As mentioned above, the upper bandwidth limit given in ETSI EN 300 422-1 is 20 MHz, while Shure is also considering channel bandwidths of 7 MHz or less.

Question 6

Should a WMAS emission in 520–694 MHz be limited to fall entirely within a single TV channel? For emissions greater than a single TV channel, should a whole number of TV channels be required (for example, emission bandwidths of 7 MHz or 14 MHz)? Should any other limitations regarding the relative positioning of WMAS emissions with respect to the TV channel raster be implemented?

At a first sight, the idea of following the current TV-channel grid sounds reasonable. However, it may not fit with the current sharing scenario in the TV-UHF band. An audio PMSE system is sharing with many other users and therefore, the frequency selection is heavily dependent on the RF environment at the event location. The start frequency and end frequency of the WMAS should not be forced to follow the existing TV channel grid as the system need to be frequency agile matching the RF situation at the event.

Additional comment: Please consider opening the complete band 470 – 694 MHz for audio PMSE (SAB/SAP) operation, which would follow the typical global allocation for audio PMSE. The expansion would also support the increase of channel count we observe for audio PMSE applications.

Question 7

⁶ ETSI EN 300 422-1 V2.2.1 (2021-11): Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Audio PMSE Equipment up to 3 GHz; Harmonised Standard for access to radio spectrum



Should a minimum spectral efficiency limitation be implemented for WMAS devices? If so, what should the minimum spectral efficiency be?

One of the major advantages of WMAS technology is to be more spectrum efficient. We suggest adding the general description as it is used in ETSI EN 300 422-1 as well:

“Wireless Multichannel Audio Systems (WMAS): wireless audio transmission systems using digital broadband transmission techniques for microphone and in-ear monitor system applications, and other multichannel audio PMSE use, e.g., with the ability to support three or more audio channels per MHz.”

Question 8

Should WMAS devices be required to comply with ETSI Standard EN 300 422?

We understand that ACMA references ETSI EN 300 422-1 for wireless microphones (and IEM). This standard does include analogue and digital modulated narrowband systems as well as WMAS and therefore can still be used as reference standard for all audio PMSE applications (wireless audio transmitters). We also expect regulators like US FCC to follow the ETSI Standard EN 300 422-1.

Question 9

Should new items be added to Schedule 1 of the LIPD class licence to facilitate WMAS, or should existing items be modified?

Following our above-mentioned proposals, the following lines could be added to complete the LIPD class license for wireless audio transmitters.



Class of transmitter	Frequency band	EIRP	Limitations
Wireless audio transmitter using WMAS technology	174 – 230 MHz	164 mW (100 mW ERP)	ETSI EN 300 422-1;
Wireless audio transmitter using WMAS technology	470 – 694 MHz	164 mW (100 mW ERP)	ETSI EN 300 422-1;
Wireless audio transmitter using WMAS technology	1785 – 1800 MHz	164 mW (100 mW ERP)	ETSI EN 300 422-1;

Please contact the undersigned if you have any questions.

Respectfully submitted,
/s/ Prakash Moorut
Prakash Moorut
Global Head of Spectrum & Regulatory Affairs
Shure Incorporated
5800 West Touhy Avenue
Niles, IL 60714
United States
Email: moorutp@shure.com