4th India Spectrum Management Conference 2024

Martin Brock, Senior Manager, Global Regulatory Policy

PMSE’s potential

Programme Making and Special Events (PMSE) is **ubiquitous to daily life**. You consume its output every day.

PMSE offers enormous socio-economic growth potential for India, **but it needs to be supported by a spectrum regulatory framework**.

‘Asia-Pacific region is expected to showcase the most promising market growth in the coming years with an estimated CAGR of 13.7 per cent from 2019 to 2028.The emerging nations such as China, India, Indonesia, Philippines, Thailand, and Malaysia are expected to grow at significant rates.’

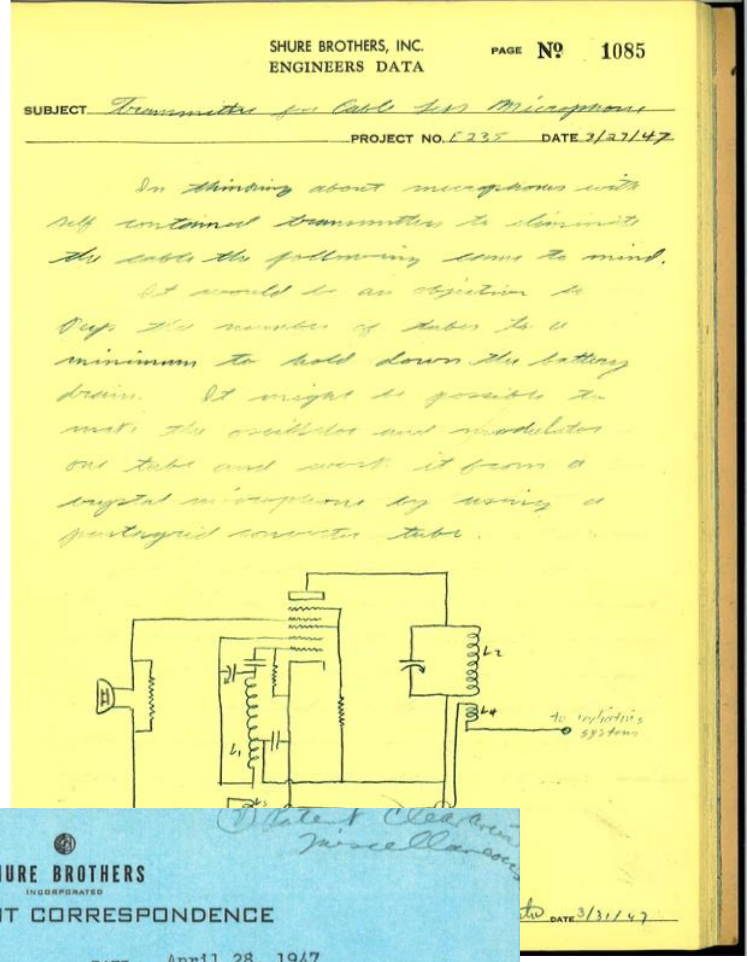
Elevating the event management landscape: interventions for India’s event industry’s growth – KPMG, July 2023

How is Shure contributing?

We're 100 years old next year. We've been thinking about spectrum regulation for a long time!

March 1947

'In thinking about microphones with self-contained transmitters to eliminate the cable the following came to mind…' - Elmer Carlson



SHURE BROTHERS, INC.
ENGINEERS DATA

PAGE No. 1085

SUBJECT Transmitter for Cable less Microphone

PROJECT NO. E235 DATE 3/27/47

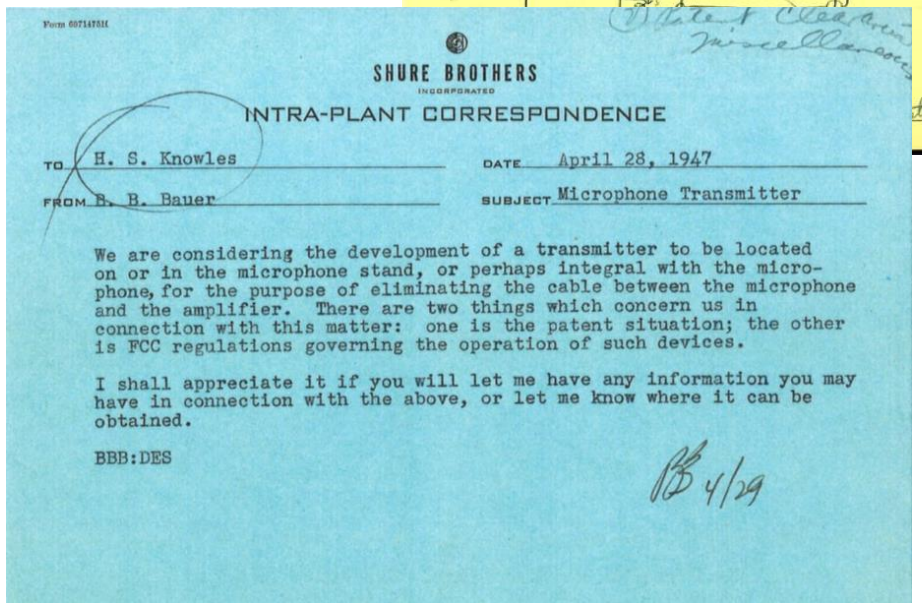
In thinking about microphones with self contained transmitters to eliminate the cable the following came to mind.

It would be an objection to keep the number of tubes to a minimum to hold down the battery drain. It might be possible to omit the oscillator and modulator one tube and work it from a crystal microphone by using a pentagrid converter tube.

April 1947

Ben Bauer, Vice-President of Engineering at Shure, proposed the idea of replacing the microphone cable with a radio frequency link.

But even back then, spectrum regulations weren't far from his mind!



SHURE BROTHERS
INCORPORATED

INTRA-PLANT CORRESPONDENCE

TO H. S. Knowles DATE April 28, 1947

FROM B. B. Bauer SUBJECT Microphone Transmitter

We are considering the development of a transmitter to be located on or in the microphone stand, or perhaps integral with the microphone, for the purpose of eliminating the cable between the microphone and the amplifier. There are two things which concern us in connection with this matter: one is the patent situation; the other is FCC regulations governing the operation of such devices.

I shall appreciate it if you will let me have any information you may have in connection with the above, or let me know where it can be obtained.

BBB:DES

BB 4/29

Recognising audio PMSE in India's spectrum plan

Shure has been an active participant in Working Group 1 (<1 GHz bands) on the National Frequency Allocation Plan (NFAP) and has called for recognition of audio PMSE within India's NFAT.

Shure also supports TRAI's call to **earmark globally harmonised spectrum for PMSE** and to **establish India as a global content hub**.

Telecom Regulatory Authority of India

TRAI

Recommendations

on

Inputs for formulation of

National Broadcasting Policy-2024

20th June 2024

f. Ensuring effective utilization of spectrum allocated for terrestrial broadcasting and earmarking globally harmonized spectrum for Programme Making and Special Events (PMSE) covering radio microphones, in-ear monitors, wireless cameras, talkback systems, etc.

3.20 In this background, the Authority recommends the following strategies to position India as 'Global Content Hub' along with the promotion of local content.

Recognised and defined within regulations

‘PMSE’ now a defined term in Part 3 of the ITU-R terminology database:

Definition

PMSE: Programme Making and Special Events

> **Programme Making:** the creation of content for broadcast, the production of films, presentations, advertisements, audio or video recordings; and the staging or performance of an entertainment, sporting, social or other public/private event.
>
> **Special Events:** occurrences of limited duration, typically from one day to several weeks or longer, which take place in specifically defined locations.
>
> Examples: cultural, sport, entertainment, religious and other festivals, conferences, and trade fairs.

ITU-R Footnote 5.296

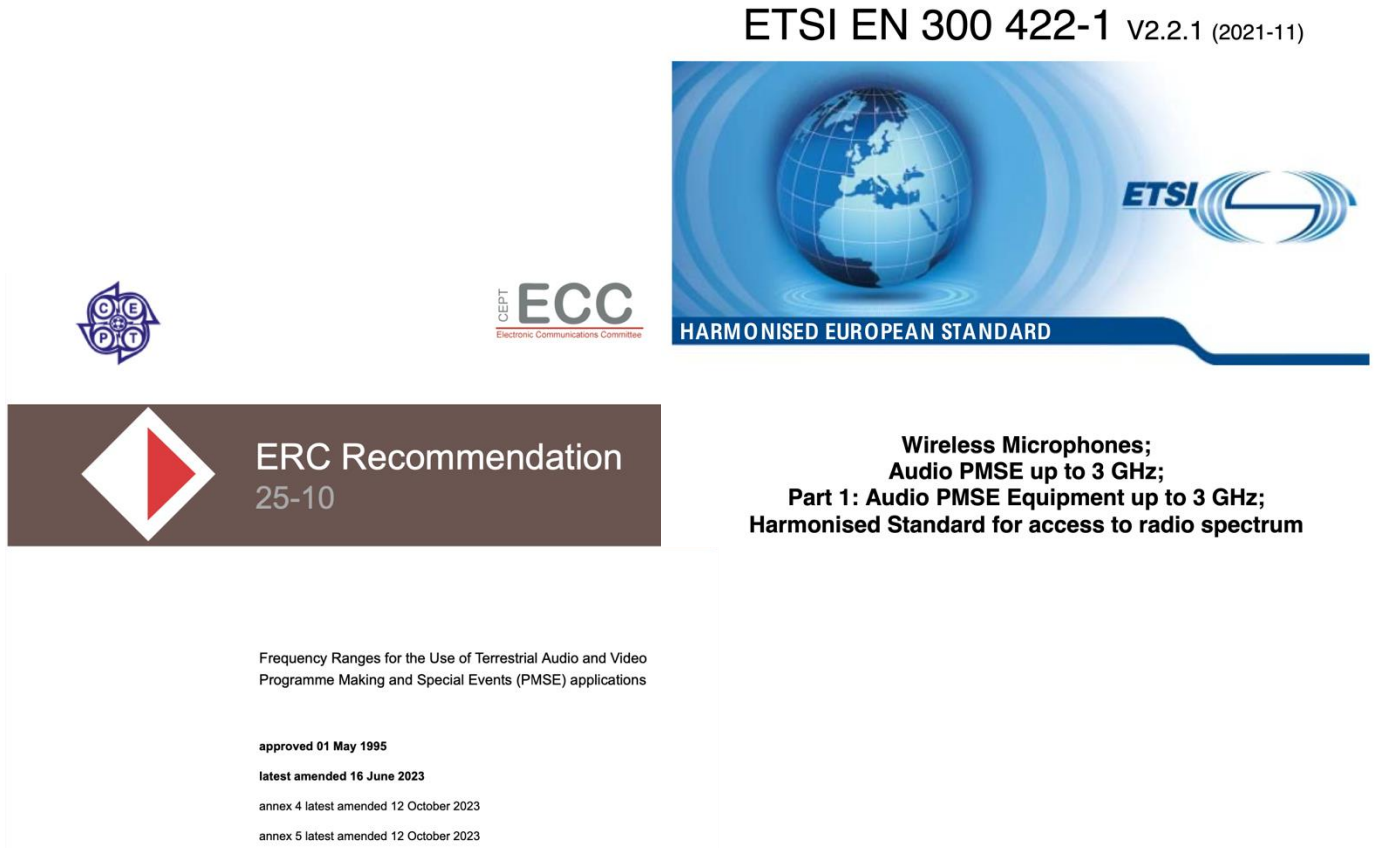
Region 1 multi-country (circa 90 admins) **secondary allocation** to SAB/SAP (PMSE) that protects the primary service (typically Broadcasting).

5.296 *Additional allocation:* in Albania, Algeria, Germany, Angola, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Burundi, Cameroon, Vatican, Congo (Rep. of the), Côte d’Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Eswatini, Finland, France, Gabon, Gambia, Georgia, Ghana, Hungary, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kenya, Kuwait, Lesotho, Latvia, Lebanon, Libya, Liechtenstein, Lithuania, Luxembourg, North Macedonia, Malawi, Mali, Malta, Morocco, Mauritius, Mauritania, Moldova, Monaco, Mozambique, Namibia, Niger, Nigeria, Norway, Oman, Uganda, Palestine*, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Türkiye, Slovakia, the Czech Republic, Romania, the United Kingdom, Rwanda, San Marino, Senegal, Serbia, Sudan, South Africa, Sweden, Switzerland, Tanzania, Chad, Togo, Tunisia, Ukraine, Zambia and Zimbabwe, the frequency band 470-694 MHz is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-23)

Established International Harmonised Standards

Recognised allocations, established standards, and harmonised tuning ranges, provide manufacturers with **regulatory stability** and **scale**.

These conditions are prerequisites for investment decisions relating to the development of equipment.



Radio microphones and In-ear monitors	A3: 470-694 MHz	ERC Recommendation 70-03, annex 10	Currently a core band for professional PMSE use. Shared use. ETSI EN 300 422.

Recent news!

This week India formally entered the contest to host the 2036 Olympic Games.

Do not underestimate the amount of frequency coordination and spectrum required to host this global event!

India would benefit greatly from the introduction of a regulatory framework for audio PMSE users when they require access to the band.

News › sports › india formally enters the race to host the 2036 olympic games

Sports

India Formally Enters The Race To Host The 2036 Olympic Games

At the IOC's 141st session in Mumbai, PM Modi made a strong case for India's bid, stating that the country's dedication to hosting the Olympics is unwavering.

Edited By : Aniket Raj Updated: Nov 5, 2024 15:02 IST

Olympics

In a historic stride towards fulfilling Prime Minister Narendra Modi's ambition for India to host the Olympics, the Indian Olympic Association (IOA) has officially submitted a Letter of Intent to the International Olympic Committee's (IOC) Future Host Commission. This move formally signals India's intention to host the Olympic and Paralympic Games in 2036, a milestone that could bring transformative benefits to the nation.

SHURE

A mature equipment ecosystem

Thanks to regulatory stability and harmonised spectrum access conditions, the 470 – 694(8) MHz band is long-established as the ”core” audio PMSE band, with a correspondingly **mature global equipment ecosystem**.

As an example of the band’s importance to audio PMSE, **at the Paris 2024 Olympic Games, 89% of licensed audio PMSE links were for equipment within the 470 – 694 MHz range** (12,345 out of a total of 13,858 audio links).

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

ANFR
AGENCE NATIONALE DES FRÉQUENCES

A- Spectrum usage by audio links

1) Overview :

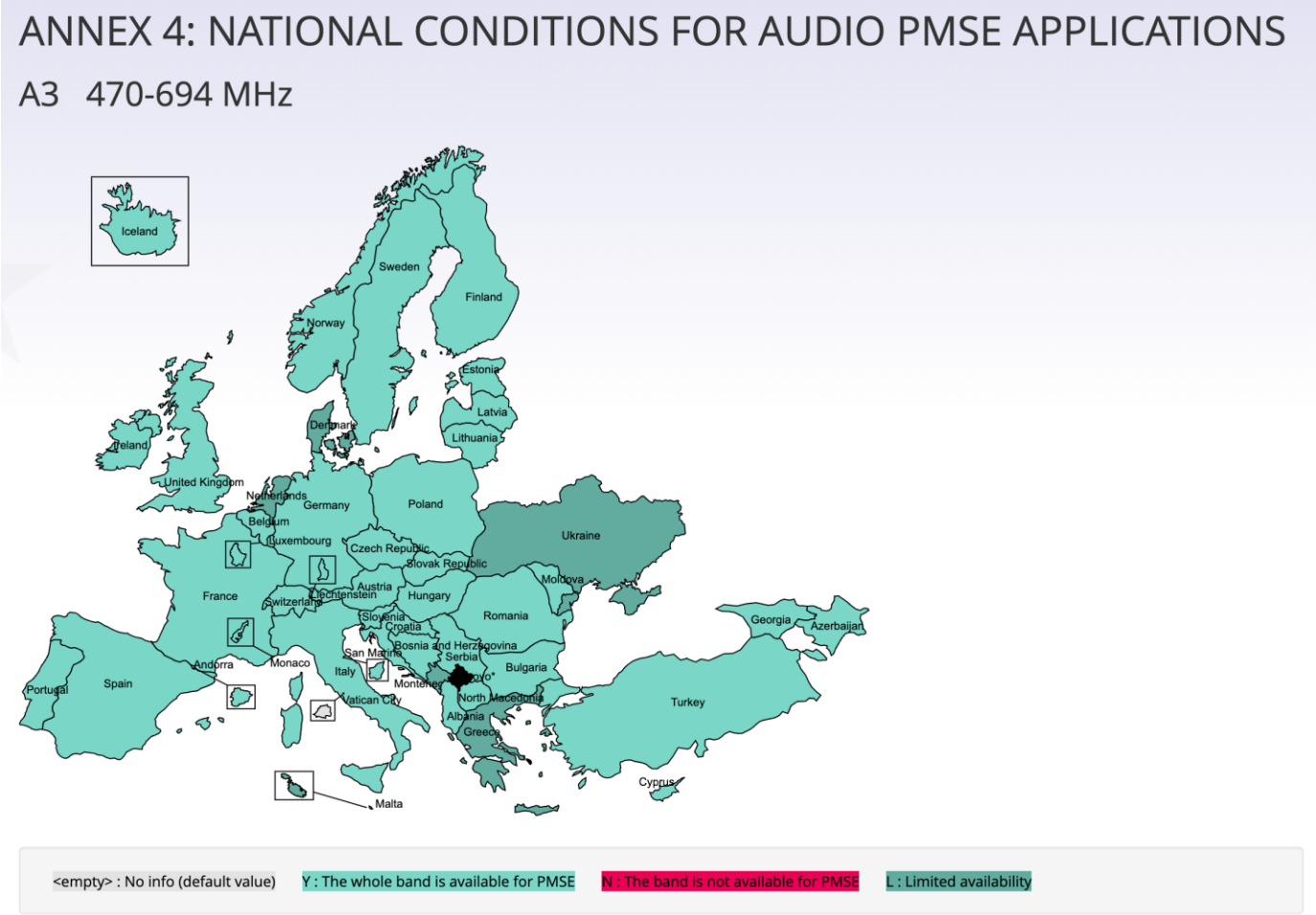
Band	Frequency band (MHz) CEPT ERC/REC 25-10	Estimated available spectrum in SBP	Number of licences*
30 MHz	32 – 39 MHz	0,45 MHz	73
VHF	55 – 68 MHz	0,9 to 2 MHz	0
	174 – 223 MHz (A2: 174-216 MHz)	Depending on venue	2
	223 – 224.792 MHz	Depending on venue	19
	226 – 230 MHz	4 MHz	0
UHF	470 – 694 MHz (A3: 470-694 MHz)	Depending on venue	12 345
	694 –698 MHz	4 MHz	79
	736 –753 MHz (A4: 733-757.5 MHz)	17 MHz	796
	821 –823 MHz (A5: 821.5-832 MHz)	2 MHz	189
	823 – 826 MHz (A5: 821.5-832 MHz)	3 MHz	13
	826 – 832 MHz (A5: 821.5-832 MHz)	6 MHz	78
1,2 GHz	1240 – 1260 MHz	20 MHz	264
	1350 – 1400 MHz (A7: 1350-1400 MHz)	9 MHz	0
1,5 GHz	1518 – 1525 MHz (A8: 1518-1525 MHz)	7 MHz	0

* 1 frequency used by a **PMSE audio link** requires 1 **licence** for each considered site & event (Olympics games, Paralympics games, Opening/Closing ceremonies)

Authorisation approaches for audio PMSE

Audio PMSE is a low-power application that has been an incumbent user of the 470 – 694 MHz band for decades, successfully using ‘white spaces’ between other services (usually TV broadcast transmitters).

46 CEPT national administrations typically have, or are moving towards, an unlicensed/licence-exempt regulatory framework that supports audio PMSE’s access to spectrum. See link.



Authorisation approaches for audio PMSE

For example, in April 2020 the German Federal Network Agency, BNetzA, adopted a general authorisation approach for PMSE in the UHF band.

In the U.S., the FCC operates both a licensed and unlicensed regulatory framework. Higher powers are permitted with a license (available to users who routinely use >50 microphones) but **94% of audio PMSE users operate under the FCC's unlicensed framework**.

Bundesnetzagentur

From 14 June until 14 July 2024

UEFA EURO2024 GERMANY

Germany will be hosting the UEFA European Championship in 2024 (UEFA EURO 2024™).

The matches will take place at ten different venues in June and July 2024. The international broadcast centre (IBC) will be located at the Leipziger Messe and there will be special events for fans in the ten EURO 2024 host cities. A simplified procedure is in place for assigning spectrum for planned short-term use: → short-term assignments

***'Unless you are in video and audio production, the odds are you have not thought much about wireless microphones. But they are everywhere**. Let's start with last weekend's Super Bowl. The commentary on- and off-field required wireless microphones, along with the halftime show. You'll find them in big Broadway productions and small-town theaters. They are everywhere on film sets. And they are commonly used in houses of worship, stadiums, and schools.'*

FCC Chairwoman Jessica Rosenworcel, FCC Report & Order of 15th February 2024

Closer coordination for exceptional events?

The largest PMSE events require most, if not all, of the available interleaved spectrum in the band (see link).

SRF Schweizer Radio und Fernsehen

Report on spectrum requirements for Audio PMSE

Events deemed of national significance, or where spectrum demand may exceed supply, benefit from detailed PMSE frequency coordination. Some regulators designate special coordination conditions to “majors” (see link).

Source: SRF

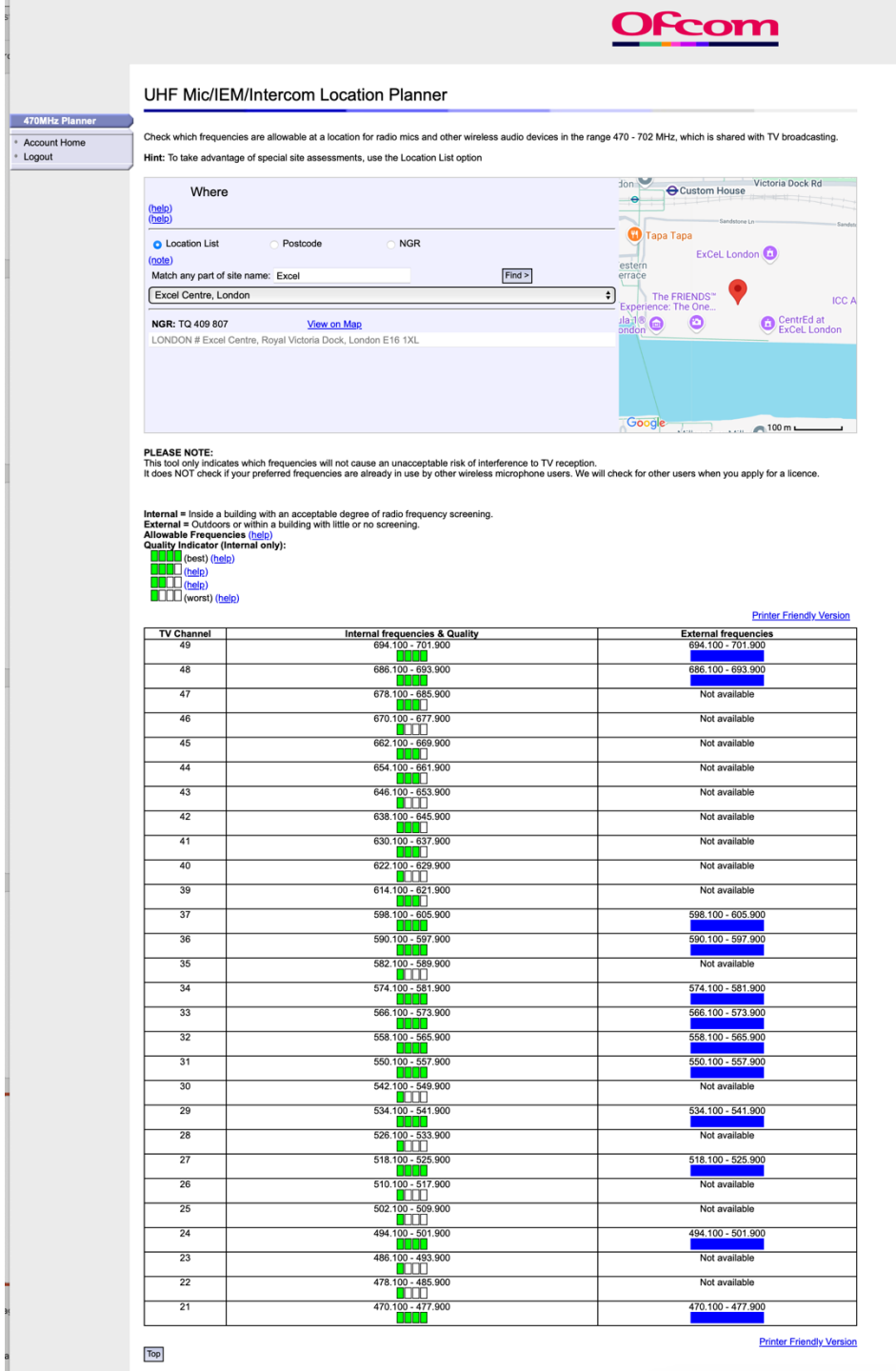
Visibility of spectrum use leads to efficient spectrum use. Coordination increases the chance of the event running smoothly by preventing interference between users and offering equitability of access to spectrum.

Automation

Authorisation does not have to be complex. It can start with a ‘manual’ process and evolve to something automated, if required.

Ofcom provides an example of a more automated coordination process for audio PMSE.

Online self-service ‘booking’ is available which offers visibility of spectrum availability to the user and can be processed within minutes.



Ofcom

UHF Mic/IEM/Intercom Location Planner

470MHz Planner
- Account Home
- Logout

Check which frequencies are allowable at a location for radio mics and other wireless audio devices in the range 470 - 702 MHz, which is shared with TV broadcasting.

Hint: To take advantage of special site assessments, use the Location List option

Where

(help)
(help)

Location List Postcode NGR

(note)

Match any part of site name: Excel Find >

Excel Centre, London

NGR: TQ 409 807 View on Map

LONDON # Excel Centre, Royal Victoria Dock, London E16 1XL

Custom House
Victoria Dock Rd
Tapa Tapa
ExCeL London
The FRIENDS™ Experience: The One...
CentrEd at ExCeL London
Google
100 m

PLEASE NOTE:
This tool only indicates which frequencies will not cause an unacceptable risk of interference to TV reception.
It does NOT check if your preferred frequencies are already in use by other wireless microphone users. We will check for other users when you apply for a licence.

Internal = Inside a building with an acceptable degree of radio frequency screening.
External = Outdoors or within a building with little or no screening.
Allowable Frequencies (help)
Quality Indicator (Internal only):
(best) (help)
(help)
(help)
(worst) (help)

Printer Friendly Version

TV Channel	Internal frequencies & Quality	External frequencies
49	694.100 - 701.900	694.100 - 701.900
48	686.100 - 693.900	686.100 - 693.900
47	678.100 - 685.900	Not available
46	670.100 - 677.900	Not available
45	662.100 - 669.900	Not available
44	654.100 - 661.900	Not available
43	646.100 - 653.900	Not available
42	638.100 - 645.900	Not available
41	630.100 - 637.900	Not available
40	622.100 - 629.900	Not available
39	614.100 - 621.900	Not available
37	598.100 - 605.900	598.100 - 605.900
36	590.100 - 597.900	590.100 - 597.900
35	582.100 - 589.900	Not available
34	574.100 - 581.900	574.100 - 581.900
33	566.100 - 573.900	566.100 - 573.900
32	558.100 - 565.900	558.100 - 565.900
31	550.100 - 557.900	550.100 - 557.900
30	542.100 - 549.900	Not available
29	534.100 - 541.900	534.100 - 541.900
28	526.100 - 533.900	Not available
27	518.100 - 525.900	518.100 - 525.900
26	510.100 - 517.900	Not available
25	502.100 - 509.900	Not available
24	494.100 - 501.900	494.100 - 501.900
23	486.100 - 493.900	Not available
22	478.100 - 485.900	Not available
21	470.100 - 477.900	470.100 - 477.900

Top

Printer Friendly Version

Thank you!

Contact: brockm@shure.com