

# Tuomo Tolonen

*Sr. Director , Global Market Development at Shure with over 25 years of experience in the professional audio industry.*

*Extensive experience of RF co-ordination and wireless technology having worked at large global events.*

*Steering Group member of BEIRG (British Entertainment Industry Radio Group) and the UK Spectrum Policy Forum*

WIRELESS

INNOVATION

FORUM™

SHURE

**SHURE**

***Since 1925, Shure products have delivered the sounds of history and culture to the world.***



With a history of innovation that began in 1925, Shure has turned a passion for making great microphones and audio electronics into an obsession. Shure continues to set the worldwide industry standard for superior, reliable audio products.

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1947

“I’m thinking about microphones with self contained transmitters to eliminate the cable, the following came to mind” – Elmer Carlson

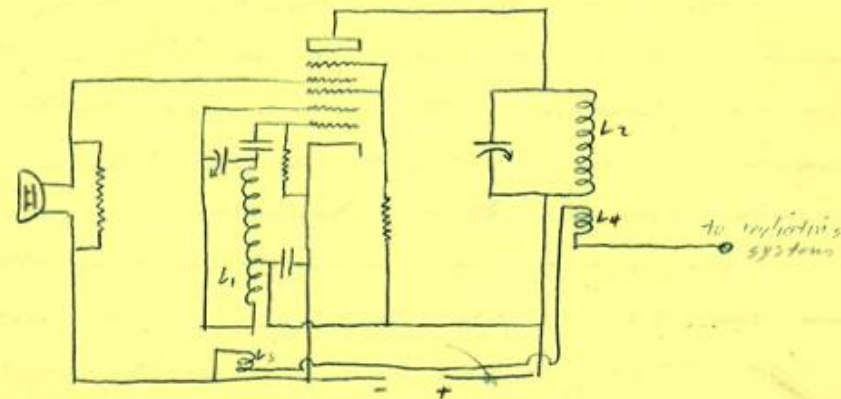


SUBJECT *Transmitter for Cableless Microphones*

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



SIGNED *Elmer Carlson* DATE *3/27/47* WITNESSED *George E. Latta* DATE *3/31/47*  
FORM #78648 ICM

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1947

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

Form 007147511

*Patent Clearance  
Miscellaneous*

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*

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**1953**

In 1953, Shure introduces the world's first wireless mic system with a handheld transmitter, the Vagabond 88

Priced at \$700, the transmitter and the receiver employed vacuum tube technology

*The Sensation of the Nation!* MAY 20 1953

The New **SHURE** WIRELESS MICROPHONE

**NO CABLE!**

*the VAGABOND "88"* MAY 20 1953

...here is the first practical Wireless Microphone ever devised for Public Address! Here is a "Magic Wand" that creates an entirely new market: Exclusive Night Clubs; Hotels; and Theatre Restaurants—and all other entertainment spots where glamour and superlative quality go hand in hand.

Enterprising entertainers will demand this fabulous, "liberating" microphone, because it gives them the freedom to move about . . . to dance . . . to sing . . . to talk to their hearts' content—free of the strain of pulling long lines of heavy cable across the floor—free to concentrate on just one thing—to distinguish themselves among the discriminating audiences of the world!

**"FOOTLOOSE AND FANCY FREE..."**

**NOT ANCHORED TO A STAND OR CABLE IS SHE!**

**NO STATION LICENSE NEEDED!  
NO OPERATORS LICENSE NEEDED!**

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● **1990**

We introduce the L-series VHF wireless microphone system.

This was 30 years after exiting the wireless mic market in 1960.



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● **2024**

Today, Axient Digital is considered by many to be the most advanced wireless system available



# Every Day Use

- PMSE is ubiquitous to everyday life, although most have little idea what PMSE is and how it works
- In addition to events, educational facilities, businesses, hospitality, conference centers, Government and many others rely on PMSE daily
- Content generated by PMSE is consumed every minute by the general public



# Broadcast



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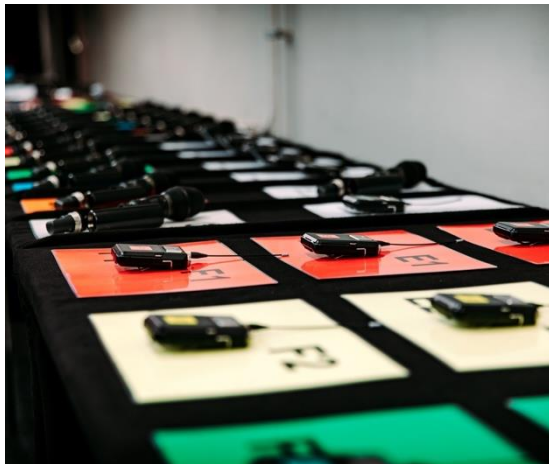
# Television Shows



Rank	Programme	Channel	Broadcaster group	TOTAL
1	STRICTLY COME DANCING (SAT 18:27)	BBC 1 (inc HD)	BBC	8,442,000
2	STRICTLY COME DANCING (SUN 19:16)	BBC 1 (inc HD)	BBC	7,413,000
3	THE GREAT BRITISH BAKE OFF (TUE 19:59)	Channel 4 Total	CHANNEL 4	6,520,000
4	LUDWIG (WED 21:00)	BBC 1 (inc HD)	BBC	6,156,000
5	NIGHTSLEEPER (MON 21:00)	BBC 1 (inc HD)	BBC	5,306,000
6	ANTIQUES ROADSHOW (SUN 18:17)	BBC 1 (inc HD)	BBC	4,407,000
7	CORONATION STREET (MON 20:01)	ITV1/Breakfast Total	ITV	4,377,000
8	CORONATION STREET (FRI 20:00)	ITV1/Breakfast Total	ITV	4,330,000
9	CORONATION STREET (WED 20:00)	ITV1/Breakfast Total	ITV	4,262,000
10	JOAN (SUN 21:01)	ITV1/Breakfast Total	ITV	3,987,000
11	EMMERDALE (THU 19:29)	ITV1/Breakfast Total	ITV	3,955,000
12	EMMERDALE (MON 19:29)	ITV1/Breakfast Total	ITV	3,936,000
13	EMMERDALE (WED 19:29)	ITV1/Breakfast Total	ITV	3,865,000
14	EMMERDALE (TUE 19:29)	ITV1/Breakfast Total	ITV	3,862,000
15	HAVE I GOT NEWS FOR YOU (FRI 21:01)	BBC 1 (inc HD)	BBC	3,847,000
16	JOAN (MON 21:01)	ITV1/Breakfast Total	ITV	3,797,000
17	EMMERDALE (FRI 19:29)	ITV1/Breakfast Total	ITV	3,791,000
18	BBC NEWS AT SIX (MON 18:00)	BBC 1 (inc HD)	BBC	3,483,000
19	BBC NEWS AT SIX (TUE 18:00)	BBC 1 (inc HD)	BBC	3,473,000
20	GOGGLEBOX (FRI 21:00)	Channel 4 Total	CHANNEL 4	3,449,000
21	ALL CREATURES GREAT AND SMALL (THU 21:00)	Channel 5 Total	CHANNEL 5	3,406,000
22	EASTENDERS (THU 19:31)	BBC 1 (inc HD)	BBC	3,396,000
23	EASTENDERS (WED 19:33)	BBC 1 (inc HD)	BBC	3,395,000
24	BBC NEWS AT SIX (WED 18:00)	BBC 1 (inc HD)	BBC	3,349,000
25	EASTENDERS (TUE 19:31)	BBC 1 (inc HD)	BBC	3,348,000
26	EASTENDERS (MON 19:30)	BBC 1 (inc HD)	BBC	3,274,000

# Television Shows

- Production at Elstree Studios where everyday RF channels are over 100 and over 200 on weekends
- Also used as a film studio and some productions are using the 960-1154 MHz DME band due to congestion



# Sports Production

56

Of top 100 global telecasts were sports\*

70%

Of adults watch sports\*

62b

Estimated value of all global sports rights \*\*\*



\*Sportica \*Mintel Group \*\*\*Statista

# Sports Production

“Produce content for multiple platforms”

“Fans want to get closer to the game”

“Fans decide how they want to consume the sport, and we need to follow the athlete”

“Put the content in the hands of the viewer”



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Quotes from SVG Sports Summit IBC

# Sporting Events



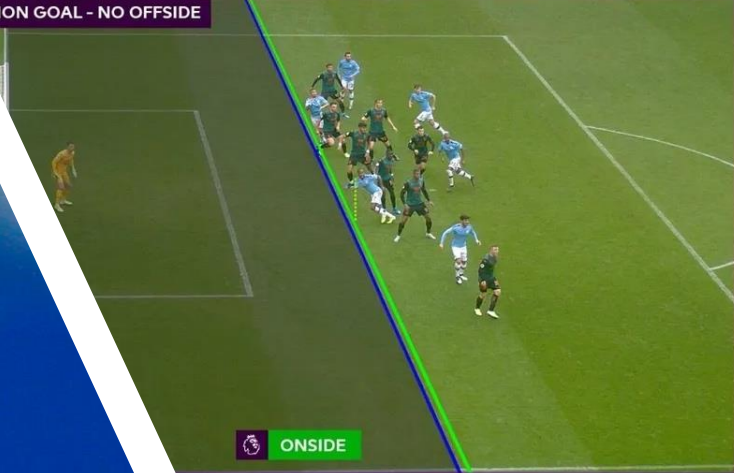
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# Sporting Events



MCI 2-0 AVL  
66:08

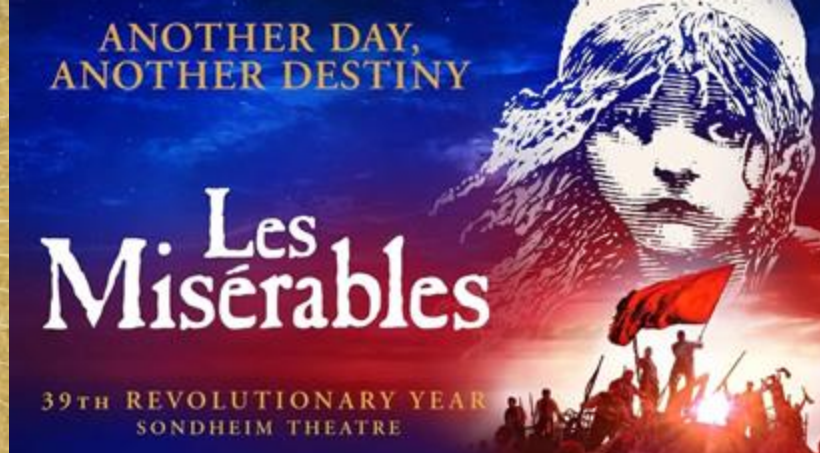
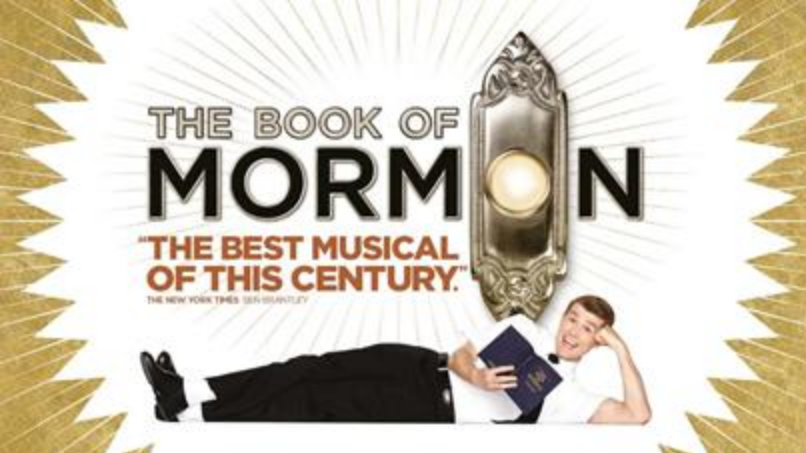
DECISION GOAL - NO OFFSIDE



VAR

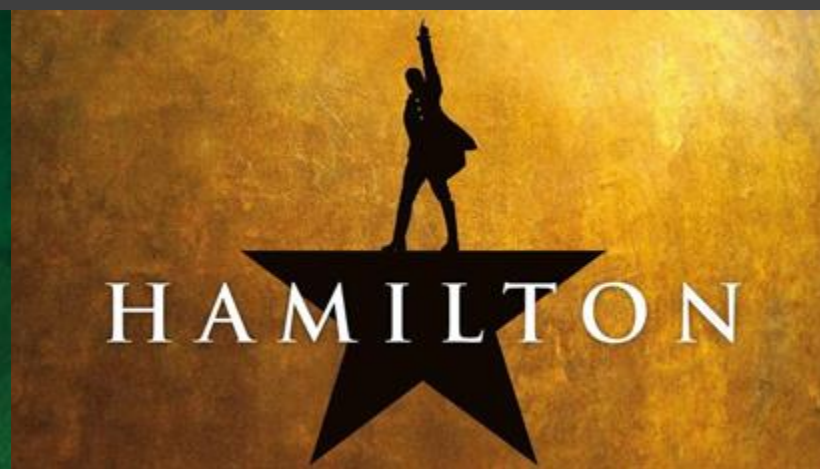


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# Theatre and Performance

- Attendances of 16,420,068 (up 7.21% from 2019)
- Gross revenue of £892,896,521 (up 11.6% from 2019)
- 19,225 performances (up 4.7% from 2019)
- A show for everyone







# Theatre and Performance

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# Corporate Events

It is estimated that **1.3 million business events** take place annually in the UK and spend on events within the corporate sector is expected to rise by as much as 83 percent according to the Annual ICE Report.



# Corporate Events



# PMSE WHAT IS IT?

PMSE provides an essential service that connects people through the digital economy

- The use of PMSE is ubiquitous to all of our daily lives
- Creates emotional, captivating and immersive experiences for audiences worldwide through television, music, performance and entertainment
- Daily benefits to business, enterprises and the general public



A photograph of Taylor Swift performing on stage. She is wearing a shimmering, sequined blue and gold dress and a gold chain necklace. She is holding a blue microphone and has her right arm raised. The background is a soft, pinkish-purple gradient.

# SWIFTONOMICS

- In recent years, high-profile tours have undeniably contributed to GDP growth
- Taylor Swift's record-breaking Eras Tour has become a global economic juggernaut, redefining the economic and cultural impact of entertainment on an international scale
- In the US, the tour generated a staggering \$4.6 billion in consumer spending
- In Europe, "Swifties" have driven a 45% year-over-year increase in airfare sales during concert dates \*
- When the tour landed in Paris, hotels benefited from larger booking spikes than the Paris 2024 Olympics \*\*

\*United Airlines Holdings Inc

\*\*Bloomberg

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# SWIFTONOMICS UK

- The impact in the UK is still being analysed, estimates expect the tour could generate an additional £1 billion in GDP \*
- Hotels reported record occupancy rates, and data shows that 77% of travelers arrive one or two days before a concert, and around 80% will stay one to three days after.\*\*
- The influx of spending in specific sectors from Swift's tour including hospitality, retail, transportation – leads to localised benefits ranging from job creation, wage increases and multiplier effects on other areas of the economy.
- UK ticket sales for the Oasis reunion tour have reportedly boosted 'non-essential spending' by British consumers to the highest level this year in September, in further proof of live music's value to the economy\*\*\*
- The [Oasis Live '25 Tour](#) was the biggest-ever concert launch in UK and Ireland, with more than 10 million fans from 158 countries attempting to buy tickets for the group's first shows since 2009



\*Data from Barclays. \*\*Collinson Research \*\*\*IQ Magazine

# WHY DOES THIS MATTER?

- Every country has a content production industry that utilizes PMSE equipment
- The wider PMSE sector is diverse and covers a multitude of industries and provides a service that the public and businesses enjoy
- Must ensure PMSE has a vibrant future across the world



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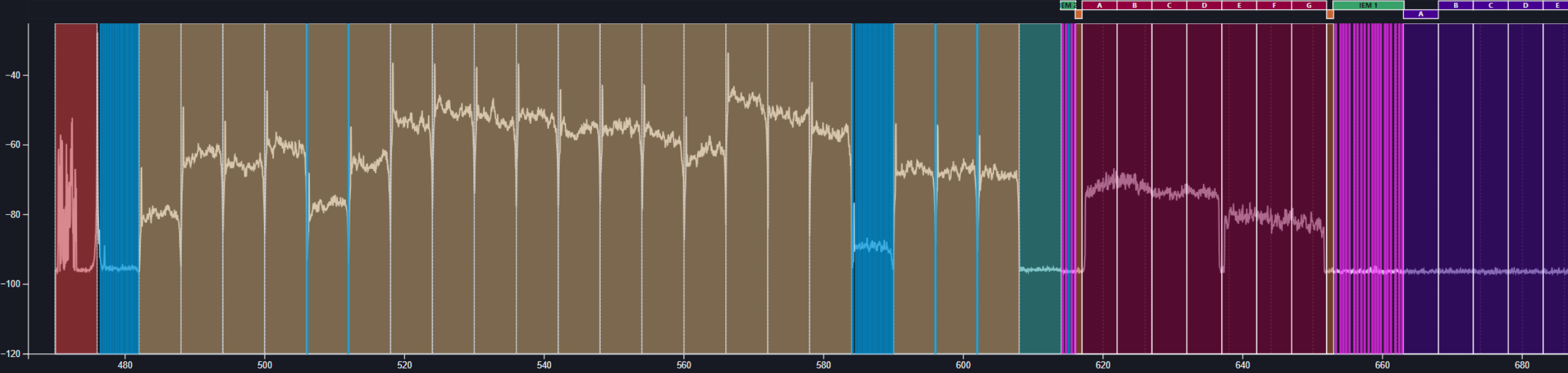
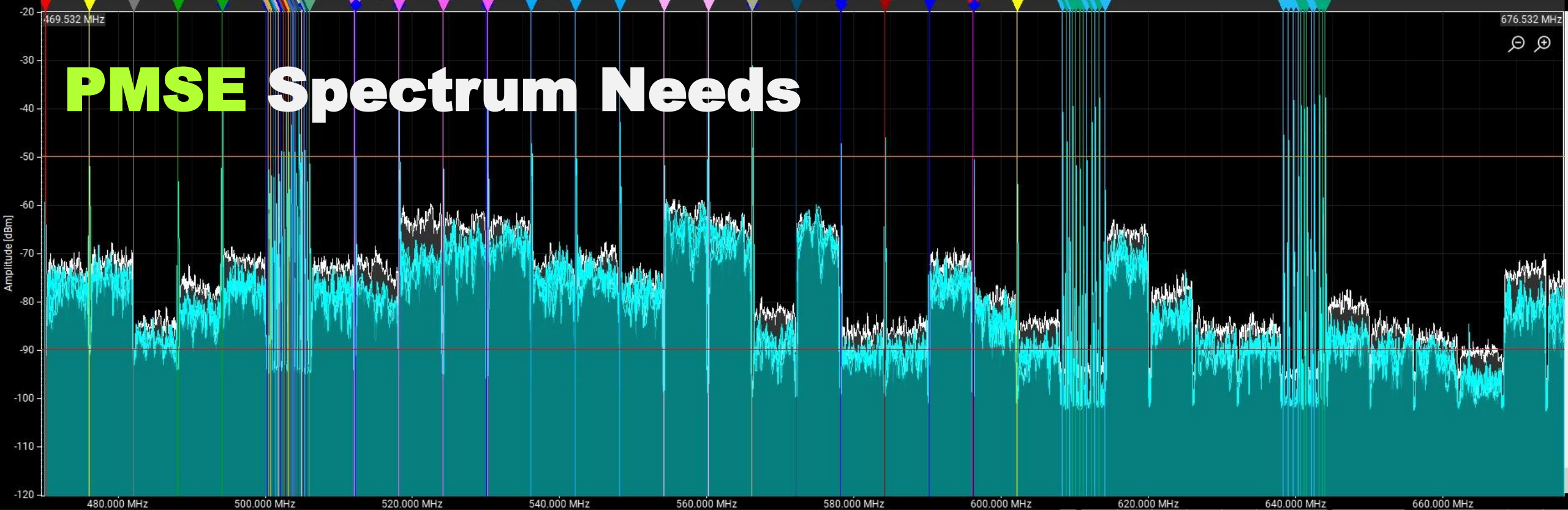
# PMSE Spectrum Needs

- A typical event production today needs 40 – 80 wireless microphones and in-ear monitoring systems with high quality of service
- Studies in Europe concluded that approximately 96 MHz are sufficient for the daily use of audio PMSE in the UHF band below 1 GHz [[Lamy Report\\*](#)].
- Report on spectrum requirements for Audio PMSE (24.3.2022), SRF (Schweizer Radio und Fernsehen)
  - Average spectrum needs range from 42 MHz for small events to 115 MHz for large events.
  - Major events: 174 MHz
- Audio PMSE has been sharing the band with TV stations for more than 60 years successfully, without creating interference issues

The 470-694 MHz range is the core band of audio PMSE, available and in use worldwide, sharing spectrum with TV.



# PMSE Spectrum Needs



## The PMSE industry seeks every opportunity to deploy new technology

- Developing Wireless Multi-Channel Audio Systems (WMAS)
- Current 5G technology does not support high quality and low latency audio transmission requirements
- It is not expected that these wideband solutions will substitute current technology



**Technology evolution cannot completely make up for lack of spectrum**

# PMSE SUMMARY

- Over the last decade we have seen PMSE spectrum reduce dramatically. In parallel with this, the industry has improved spectral efficiency to mitigate the losses
- Demand for PMSE created content is experiencing significant growth driven by both the traditional audiences and the new global audience realised by new delivery platforms
- It is essential to recognize the global significance and social and economic value of PMSE

# PMSE SUMMARY

- Globally harmonized spectrum, in the 470-694 MHz range dedicated to content creation is a critical requirement for us all as many activities are peripatetic on a worldwide basis
- Global regulators should recognize the collective need for a long-term, global solution that allows PMSE to thrive and in turn feed the digital revolution mobile and the internet enables

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"We know very well that absolute perfection cannot be attained  
but we will never stop striving for it."

S.N. Shure

QUESTIONS?

