Unit 2.4

WIRELESS MICROPHONES

WIRELESS MIC SYSTEM

MICS
(LAV,YEARSET,HANDHELD)

TRANSMITTER

ANTENNA+
RECEIVER

HOW DO THEY TALK?

RADIO WAVES

Most wireless audio equipment accomplishes its task by converting the audio signal into a radio wave, then back to an audio signal.

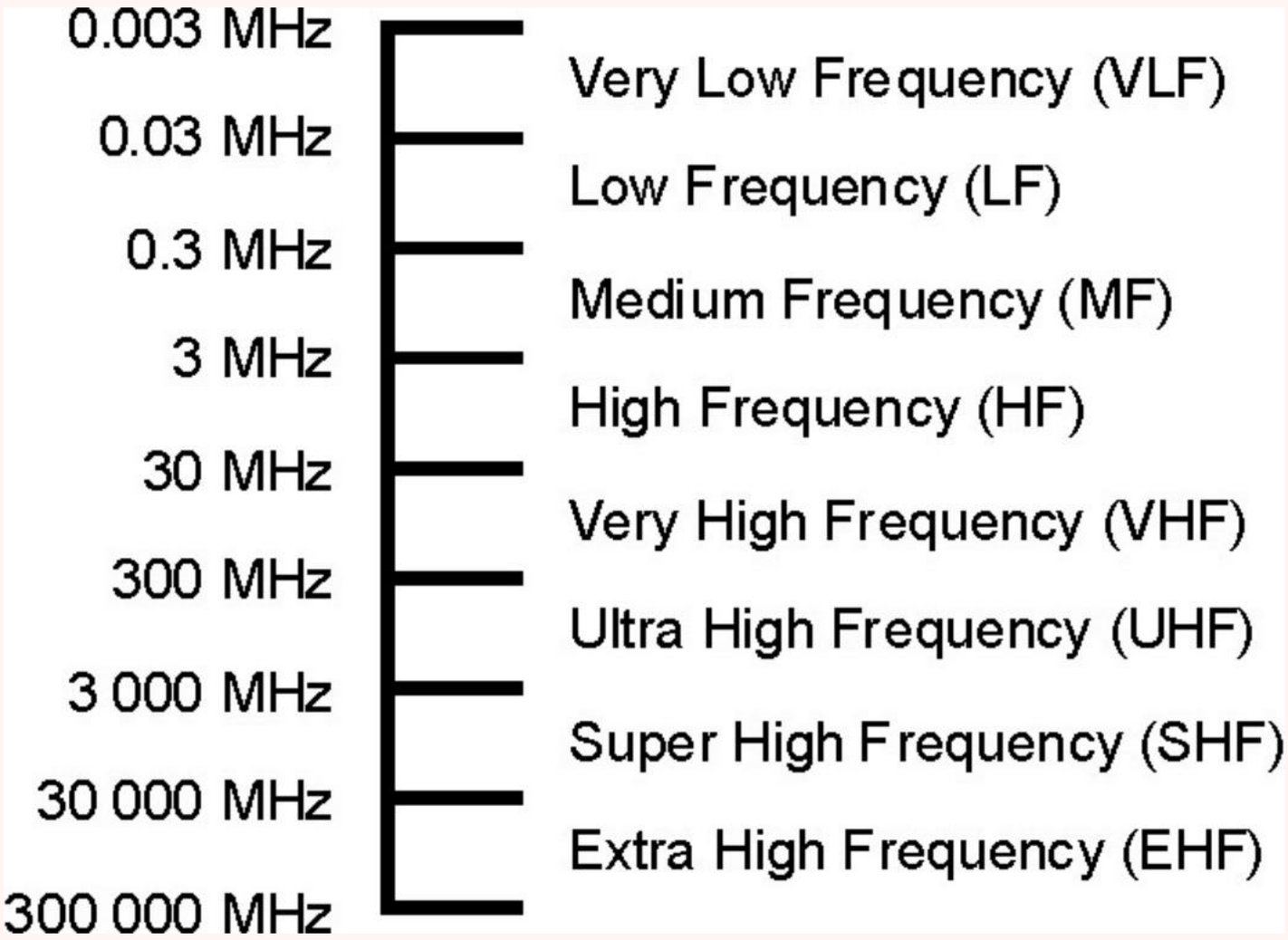
Radio waves travel at the speed of light and are able to travel a significant distance from the source. These characteristics make radio the ideal form of transmission for audio applications, from broadcast radio and television to cordless phones.

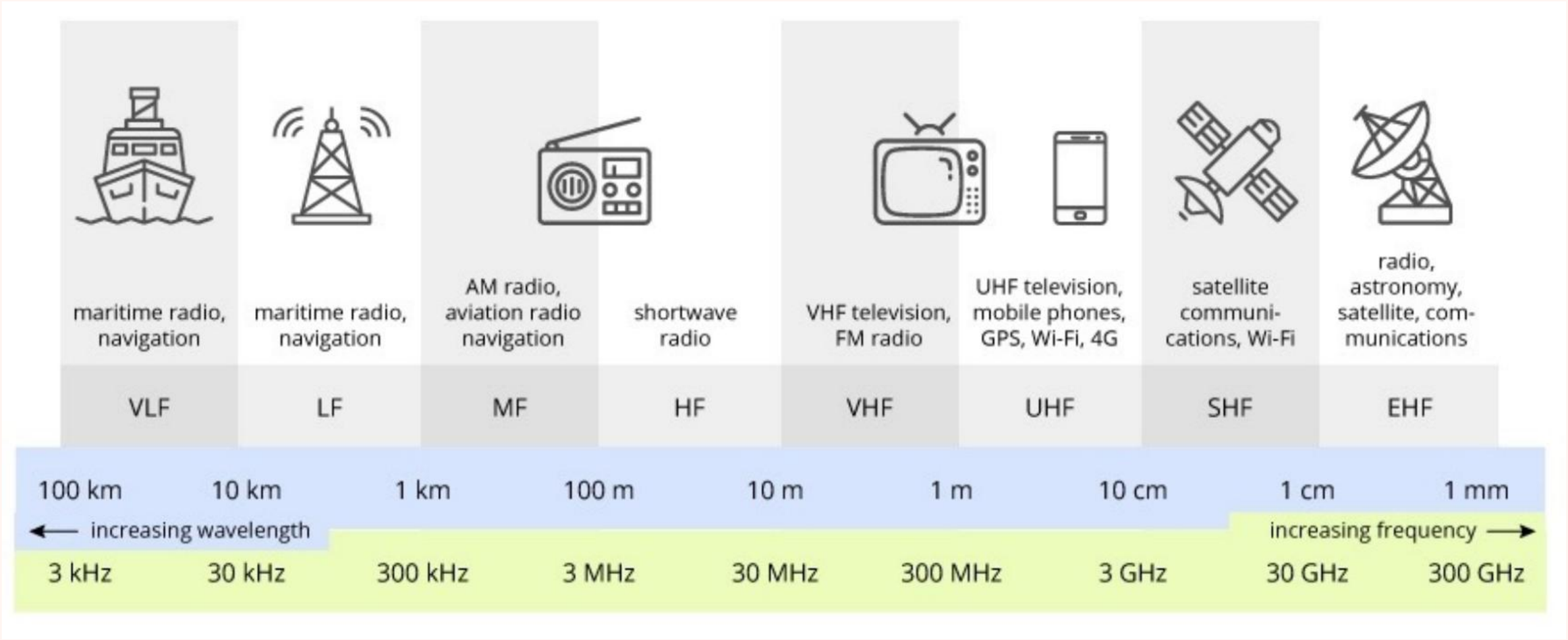
RADIO WAVES

Like sound, a radio wave can be described by its frequency and its amplitude. Frequency is measured in hertz (cycles per second). Frequencies in the radio spectrum range from a few hertz to beyond the gigahertz (GHz) range.

Most professional wireless audio systems operate in the megahertz (MHz) range.

Since June 2010, the FCC has ruled that only the 470 MHz to 698 MHz spectrum, shared with television broadcast stations, is available for wireless audio users in the U.S.


0.003 MHz
0.03 MHz
0.3 MHz
3 MHz
30 MHz
300 MHz
3 000 MHz
30 000 MHz
300 000 MHz
Very Low Frequency (VLF)
Low Frequency (LF)
Medium Frequency (MF)
High Frequency (HF)
Very High Frequency (VHF)
Ultra High Frequency (UHF)
Super High Frequency (SHF)
Extra High Frequency (EHF)


maritime radio, navigation
maritime radio, navigation
AM radio, aviation radio navigation
shortwave radio
VHF television, FM radio
UHF television, mobile phones, GPS, Wi-Fi, 4G
satellite communi-cations, Wi-Fi
radio, astronomy, satellite, com-munications
VLF
LF
MF
HF
VHF
UHF
SHF
EHF
100 km
10 km
1 km
100 m
10 m
1 m
10 cm
1 cm
1 mm
increasing wavelength
increasing frequency
3 kHz
30 kHz
300 kHz
3 MHz
30 MHz
300 MHz
3 GHz
30 GHz
300 GHz

VHF Microphones (Very High Frequency)

VHF microphones operate within the frequency range of 30 MHz to 300 MHz. They are known for their excellent penetration through walls and objects, making them suitable for indoor events where barriers may interfere with the signal.

VHF mics are typically more affordable, making them an attractive option for budget-conscious users. However, VHF signals can be more susceptible to interference from other electronic devices operating within the same frequency range, affecting audio quality in crowded environments.

Despite this, VHF wireless mics can be a reliable and cost-effective choice for smaller events and settings where the potential for interference is minimal.

UHF Microphones (Ultra High Frequency)

UHF microphones operate within the frequency range of 300 MHz to 3 GHz. They are more resistant to interference than their VHF counterparts, offering clearer sound quality and a wider range of channels. This makes UHF mics ideal for larger events or environments with multiple wireless systems.

The UHF band's ability to accommodate more channels reduces the likelihood of signal overlap and interference. Although UHF mics are expensive, their superior audio clarity and signal stability performance often justify the investment, especially for professional applications such as concerts, theater productions, and large-scale presentations.

Key Differences Between UHF And VHF Mics For Parties

Factor	VHF Microphones	UHF Microphones
Frequency Range	30 MHz to 300 MHz	300 MHz to 3 GHz
Interference	More susceptible to interference	More resistant to interference
Number of Channels	Limited range of channels	Wide range of channels
Range	Slightly more range in open spaces	Slightly less range in open spaces
Audio Quality	Good, but can be affected by interference	Clearer and more stable sound quality

FREQUENCEY BANDS

Shure ULX1 Wireless Bodypack Transmitter - J1 Band

ULX-S Series Wireless Bodypack Transmitter with On/Off Switch and 300-ft Operating Range - J1 Band (554-590MHz)

https://www.youtube.com/watch?v=_lvzZPRyOwo

Frequency Coordination and Calculation

The basic steps for a frequency coordination are as follows:

1. Perform a scan of the RF spectrum. Before manually defining exclusions, scan your environment to identify active frequencies to avoid.

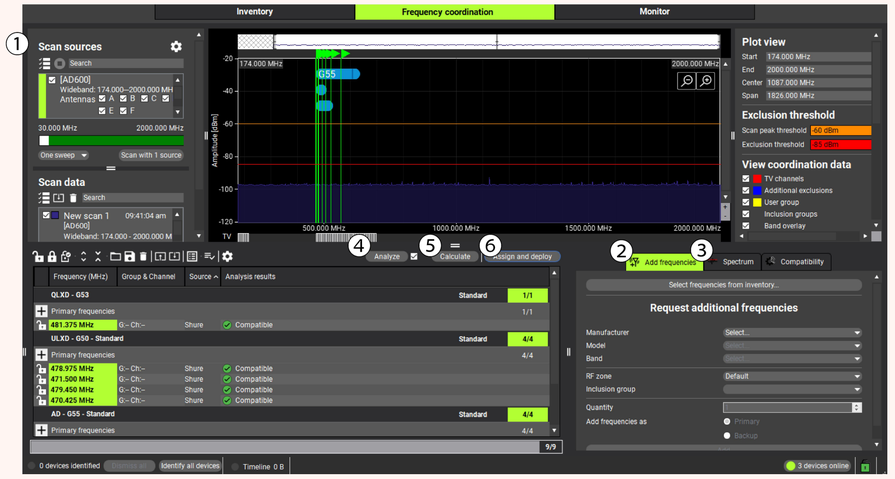
2. Bring frequencies from your inventory into the coordination workspace.

3. Define the RF spectrum by choosing frequencies to include or exclude. To make sure you don't miss any occupied frequencies, search a TV channel database and manually define frequencies to include or exclude.

4. Analyze frequencies for compatibility. Wireless Workbench will identify whether the frequencies you have defined are compatible with the systems in your inventory.

5. Calculate compatible frequencies.

6. Assign and deploy frequencies to the inventory.



FREQUENCY FINDER

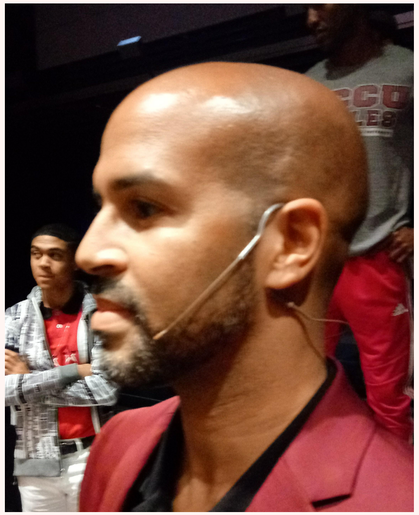
https://www.shure.com/en-US/support/tools/frequency-finder

ATTENNA DISTRIBUTION

ATTENNA DISTRIBUTION

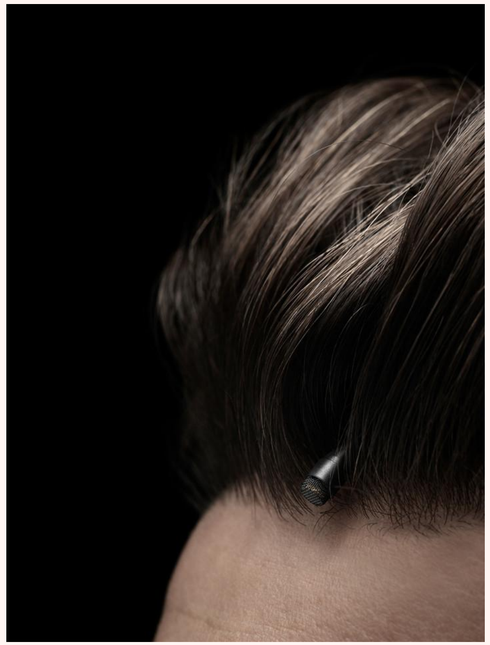
WIRELESS MICS

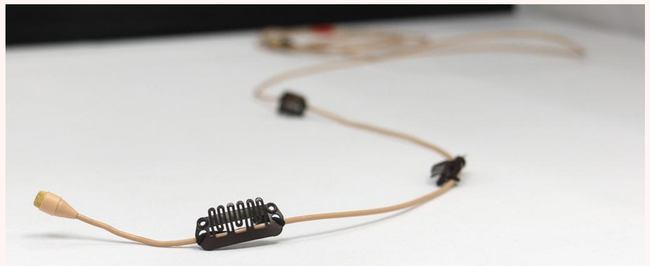
- Hand Held
  - Options of capsule/element
- Body Pack
- Lavalier
- Headset



- Single Ear
- Double Ear

- Head Worn
  - Halo
  - Hair/Wig
  - Cheek
  - Ear rig





MIC FITTINGS