KENWOOD

ANALOG vs. **DIGITAL RADIOS**

HOW TO SELECT THE RIGHT TECHNOLOGY

ANALOG AND DIGITAL TWO-WAY RADIOS HAVE MANY SIMILARITIES BUT ALSO VAST DIFFERENCES

Time-tested handheld analog radios have been a staple for reliable two-way voice communications since the early 20th Century.

While the introduction of digital two-way radios has accelerated in the last few decades, analog radios are still a viable and appropriate choice, so many organizations are weighing the pros and cons of each technology. This review of typical features in analog and digital two-way radios will help you determine which technology best fits your needs.

WHAT ARE THE BENEFITS OF ANALOG RADIOS?

Analog two-way radio technology continues to have real-world applications for business and government users as a reliable form of voice communication.

Analog two-way radios use frequency modulation (FM) to encode a voice signal in a carrier wave. These carrier waves are licensed as radio channels across specific portions of either Very High Frequency (VHF) or Ultra High Frequency (UHF) bands.

All handheld radios use push-to- talk to send voice communications, as well as scan multiple frequencies and offer limited encryption features. Analog radios deliver what's described as natural sounding voice communications, but offer limited security and little filtering of background noise.

Analog two-way radios are affordable because the base technology is simple, unlike a digital radio, which becomes more expensive as features are added.

While analog radio signals can be transmitted over long distances, the voice signal weakens as it travels further away from its source. Also, with analog radios, a single conversation takes up the entire channel bandwidth. Analog is a simpler form of radio signal, so it is often used in applications for organizations whose communication needs are limited or with a small geographic footprint, such as K-12 education, retail, and construction. Analog radios are budget friendly as there is no need to upgrade base communication systems or security standards necessary with digital radios.

Finally, analog radio is simple to use, easily interoperable, and typically these radios are plug-andplay with little training needed to operate.

WHAT ARE THE BENEFITS OF DIGITAL RADIOS?

A digital two-way radio has all the same basic features as analog radios. However, there are several key differences.

Unlike analog radios, digital radio signals are software-enhanced and capable of sending voice communications using binary packets (zeros and ones), creating a redundancy that makes it more dependable.

Digital two-way radios can allow more people to communicate on a single RF channel, which helps multiple users transmit an urgent message. The software in the radio hones in on the voice message

6 REASONS TO CHOOSE ANALOG TWO-WAY RADIOS

Two-way analog radio is a reliable choice for most users. Here are some of the key benefits.

- **1. AFFORDABLE:** Because the technology is not software-enhanced, it is simpler and affordable.
- **2. BASIC ENCRYPTION:** Basic encryption means users still have secure channels.
- **3. EASE OF USE:** It is simple to use and since little training is needed, users can get up and running quickly.
- **4. NATURAL VOICE:** It is a popular choice with some users as it offers natural voice communications.
- **5. SIMPLE, BUT RELIABLE:** It can be a reliable option for organizations with relatively simple communication needs and a limited geographic footprint.
- **6. TIME TESTED:** Analog radio technology has been used across industries for myriad applications.

and helps to block out RF interference and background noise, delivering improved voice quality compared to analog.

Voice communications also remain consistently loud and clear from the sender all the way to the receiver, versus analog where the signal weakens as it travels further from its source. If a signal gets corrupted because of radio interference, the voice message is still delivered because of forward error-correcting (FEC) software

that helps to rebuild voice packets from weak RF signals. (At first, voices may sound "robotic", but after a short time, everyone gets used to the difference and can easily understand conversations.)

Analog and digital radios easily last an 8-hour shift for a basic battery. However, digital radios offer longer battery life compared to analog radios because digital radios only use power intermittently, making batteries last up to 40 percent longer.

Being software-based means digital two-way radios offer more encryption options compared to analog radios. As a result, digital two-way radios are very secure, and it is difficult for others to listen in on private transmissions.



The Differences Between Analog and Digital Two-Way Radio Voice Quality Across Distances

Also, digital radios can be integrated into a larger digital communications radio network or even tie into IT networks to offer additional data features, such as tracking a radio or locking out a specific user. Some digital radio models operate in both analog and digital modes, facilitating a gradual migration to fully digital operation.

Analog two-way radio technology will continue to be a reliable choice for users with simple communications requirements and budget constraints, while a digital two-way radio offers enhanced features for more complex communication needs, including voice quality and security.

6 **REASONS** TO CHOOSE **DIGITAL** TWO-WAY RADIOS

Software-based digital two-way radios have enhanced data-rich features.

- ADVANCED ENCRYPTION: Advanced encryption means more options for secure communications.
- CLEAR VOICE: Digital radios block background noise and deliver improved voice quality, expanded coverage, and no degradation in voice quality over distances.
- **3. DIGITAL FEATURES:** These include much higher GPS throughput, IP data, OTAP data, large databases of group and unit IDs that allow for more efficient system usage.
- **4. ERROR-CORRECT FEATURE:** Voice signals are rebuilt if a signal gets corrupted because of interference.
- 5. MULTIPLE COMMUNICATIONS ON ONE CHANNEL FOR GREATER EFFICIENCY: Several users can communicate over a single channel.
- **6. REDUNDANCY:** Radio signals are softwareenhanced and sent across a range of frequencies using binary packets, creating redundancy and higher reliability.

JVCKENWOOD USA Corporation 1440 Corporate Drive Irving, TX 75038 kenwood.com/usa 1-800-950-5005

JVCKENWOOD Corp. manufactures analog and digital two-way radios, including P25 compliant and NEXEDGE[®] radios that use the NXDN[®] and DMR protocols.