



Analog -vs- Digital Radios

What is the difference, which should you choose?

Radios offer a reliable form of communication that military, commercial, industrial, and private individuals employ daily. In the beginning analog radio was limited to a small population but has since ballooned into a much more popular form of communication. Over the years the spectrum has become crowded and we have developed a need to come up with new ways to keep radio waves open for all. Analog radio is the traditional type of radio; digital radio is the newest radio technology available. Each variant is uniquely different in how they operate, I hope this article helps HMS Motorsport Customers understand the differences between the two in order to make an informed decision on which to purchase.

ANALOG RADIOS

Analog two-way radios were originally put into use by the U.S. Military in the early 1900s and later introduced to the world of business. Since its inception to the public in 1933 analog radio technology has reached its peak and innovation for this technology has slowed dramatically. Analog radios have many beneficial qualities to offer. Most radios of this variety offer options such as push-to-talk, scanning, limited encryption, and simple group conversations. Today's analog radios use frequency modulation (FM) which creates a constant wave. In modern times this is a simple system to manufacture and install making analog radios more affordable. Just like an older FM radio station in your car, the further away one is from the transmitting base, the signal will fade and quality will eventually fade into white noise. Thanks to innovative individuals throughout history there are many additional tasks that traditional Analog radios can perform. Even the original cellular phones operated via analog signal – as more and more people adopted that technology; digital platforms were invented and eventually the United States infrastructure was switched altogether in 2009.

DIGITAL RADIOS

Modern Digital radios offer many improvements over analog radios such as: greater range, higher voice quality, increase in reliable coverage, and advanced software reliability. This type of radio varies in the features they have to offer but the technology intrinsically guarantees a 30-50% increase in battery life over traditional radios. This is because the digital transmitter has the ability to “standby” and does not constantly run. Cell phones greatly rely on this to achieve their claimed battery life and your digital radio is no different. Digital radios offer advanced features such as complete encryption, multiple conversations on the same frequencies, unit ID, and even GPS location transmitting. Digital radios employ certain algorithms that correctly identify a voice against background noise which offers the users enhanced audio quality. Since their radio signal is not a constant wave form, digital radios are able to offer extended coverage and maintain the audio quality at a distance their analog cousins lack.

CONCLUSION

Analog and Digital radio systems are both capable communication systems and depending on which type you choose will dictate how well your team will be able to communicate with each other. It is an important call that could be the difference between winning and losing – or perhaps even being able to communicate to the right people during an emergency. Here at HMS we prefer the Digital systems in our cars; what will it be for you?

Advantages of Analog Radio

- Multitude of accessories and add-ons available due to the length of time analog radios have been around.
- Easily affordable
- Analog systems are easy to use and generally well understood by the public.
- These systems make productive use of bandwidth.

Disadvantages of Analog Radio

- In most cases you can only have one two-way conversation going on at any given time using the same channel.
- Receivers and transmitters are made to fit specific transmissions. The devices can be upgraded but the technology is stagnating.
- Shorter range compared to Digital
- Shorter battery life as the transmitter never rests.

Advantages of Digital Radios

- More conversations can take place on one channel.
- Unit ID, enhanced text messages, and status buttons can all be embedded into a digital radio channel.
- Reduced bandwidth consumption.
- High audio quality
- Software application upgrades are constantly produced.
- Digital platforms enable you to use both digital and analog radios simultaneously.
- 30-50% battery life increase.

Disadvantages of Digital Radios

- Digital signals will not tolerate powerful RF (radio frequency) signals, and as a result if there is ever too much RF noise the signal can completely drop in error.
- Initial learning curve is steep for new programmers.
- Newer, advanced technology is more expensive to produce