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Advantages and disadvantages of Digital Radios

Analog Radio

Advantages

1. There are a lot of accessories and add-ons available due to the extent of time analog radios have been around but generally, the same accessories can be used for both dPMR digital and analogue radios.
2. Analog systems are easy to use and generally well understood by the public.

Disadvantages

1. In most cases you can only have one two-way conversation going on at any given time using the same channel.
2. Receivers and transmitters are made to fit particular transmissions. The devices can be upgraded but the technology can't be.
3. Software for business applications is not available for analog.
4. These systems do not make productive use of bandwidth. The current use in marine band of 25 kHz per voice transmission is VERY inefficient – Land Mobile has been using 12.5 kHz for over 30 years, and most digital systems either use 6.25 kHz directly, or equivalent

Digital Radios

Advantages

1. More conversations can take place on one channel.
2. It's more spectrally efficient, certainly, but the channel allocation depends on the system (FDMA v. TDMA)
3. Unit ID, enhanced text messages and status buttons can all be embedded into a digital radio channel.
4. Your bandwidth consumption is reduced with digital radios.
5. Both existing infrastructure and antenna systems can be used for transmitting digital signals. This is for FDMA (ie: dPMR). TDMA style systems require some modifications

to take into account the accurate timing requirements.

6. Background noise greatly reduced due to advanced algorithms that can detect the difference between talking and background noise.
7. Many new software applications are available all of the time.
8. Digital platforms enable you to use both digital and analog radios simultaneously.

Disadvantages

1. It could take more time for first-time users to learn how to use. (For dPMR, the only change is how to select a digital channel rather than analogue. Other digital systems DO have more to learn, but dPMR was chosen because of its simplicity.)
2. Digital signals will not tolerate RF (radio frequency) signals, and as a result if there is ever too much RF noise the signal can completely drop in error. (dPMR operates in the RF environment very similar to analogue, in both cases, if there is too much noise, both will fail. The difference is that an analogue radio will produce noise at the speaker which requires the operator to adjust the squelch control, the digital one will just go quiet.)
3. Due to the fact it is newer and more technologically advanced it is also more expensive. (This is true of some digital systems, but dPMR was designed to be simple to operate and simple to implement. To add dPMR facility to an existing analogue radio will vary from manufacture, depending on the technology already in use, but can be as simple as an additional IF filter, the addition of the voice coder and a change in software. dPMR technology is now mature in the LMR market, so the solutions are well known and most development costs have already been written off, so the incremental cost of dPMR is small (the same cannot be said of many other digital standards, however, where substantial changes to design could be required). In the UK, you can now buy a professional grade dPMR radio for approx £102, consumer grade for substantially less (dPMR-446).

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