HME

Customer Driven

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Often times the question comes up, "why won't the DX200 Wireless Intercom be interfered with by Wi-Fi and/or 2.4 GHz cordless telephones?" It is not that there have been cases of interference; rather, there is concern with the potential it could occur.

Frequency hopping is part of the answer. Wi-Fi is direct sequence (DSSS) for 802.11b and Orthogonal Frequency Division Multiplexing (OFDM) for the newer versions.

DSSS is a wideband signal (~10MHz out of 83 MHz) centered on a given frequency (no hopping). When our radio tunes to a nearby channel the intercepted energy is low in our bandwidth (1MHz). Wi-Fi is spread evenly over its bandwidth 50mW/10MHz = 5mW/MHz. Our radio can cope with it as though it were just noise because the level is low compared to our FSK signal. Also because our radio is hopping, it can reject a channel if the received signal strength indicator (RSSI) is too high.

OFDM is a multi-carrier system. Each carrier is modulated by binary phase shift keying (BPSK). If you had 16 carriers you could transmit 16 bit words with a BPSK rate of 1/16. For Wi-Fi, 802.11g, the bandwidth is ~30MHz out of 83 MHz. Again if our radio “hops” to one of these carriers, it would lose only one 10ms chunk of information because it would then “hop” to another channel for the next chunk of information. Again, our radio will work to reject a channel if the RSSI is too high; at least for some time. OFDM is low power on a given channel compared to our signal so we likely will not even lose packets.

As for cordless telephones, most of these are frequency-hopping spread spectrum (FHSS), just like our equipment. As a note, multiple Wireless IQ and/or DX200 systems can operate side by side. This is because their hop sequence is pseudo-random. Thus there is low probability that they will be on the same frequency at the same time. This is also the case with the cordless telephones. Even though they are also FHSS, the specific frequencies that they hop through may be different from ours. But also, their hop sequence is also pseudo-random such that probability of collision is low. In the case where they do collide, it would lose only one 10ms chunk of information because it would then “hop” to another frequency for the next chunk of information.

Our radio design also provides encryption. This secures the transmitted information and prevents unauthorized people from understanding the audio or data even if they could follow the frequency hopping sequence.

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