

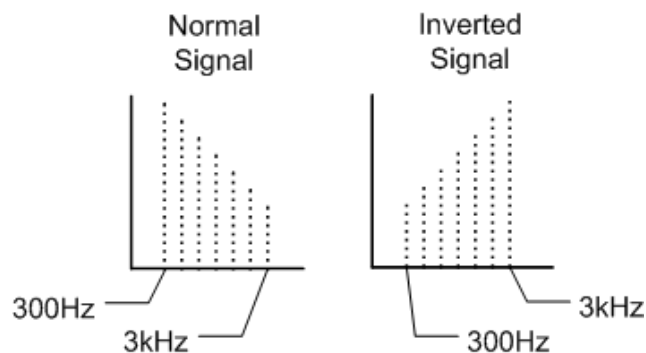
How does encryption work?

Encryption modifies a voice signal using a coding algorithm. This algorithm is controlled by an encryption key. The encryption key is used by the transmit and receive radios to enable the voice signal to be coded and decoded for both radios. Therefore, all radios communicating must have matching encryption keys, or encryption won't work.

There are several different methods for encrypting voice signals.

Simple Inversion

Inversion scrambling inverts the frequencies and volume of the voice signal. In the following idealized example, all the voice signal frequencies at 300Hz are inverted to 3kHz. The volume level is also inverted. The Icom UT109 Scrambler Unit uses the simple inversion technique.



Hopping Inversion

This method adds a greater degree of security than simple inversion. Using this method, the frequencies and frequency rates change irregularly. This causes a voice signal that appears to "hop" all over a number of different frequencies and frequency rates.

Rolling Code Inversion

Rolling code inversion uses a method where the voice signal is inverted at a constantly changing rate. It starts at an upward inversion frequency direction and climbs to the upper limit. Then, it reverses direction and inverts at lower frequencies until it reaches the lower limit. The Icom UT110 Scrambler Unit uses this inversion technique.

