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Sienna Construction Note
1/9/2010 (updated 2/6/10)

Transmitter distortion in USB mode

Problem: LSB works fine, but USB has high distortion

Cause: The AM filter is inline in both USB and LSB modes. This provides extra unwanted-sideband suppression in LSB, since the SSB filter and the AM filter share the same lower edge. In USB mode, however, the AM filter encompasses both sidebands of the DSB signal, resulting in less unwanted-sideband suppression. In addition, the default setting for the variable filter bandwidth is too high, and the transmitter's local oscillator is not set high enough in frequency to compensate for this.

Fix: In Rev A.01.22 and before, set the "TxBW cal SSB" parameter to 82 and, when using USB, set the "Tx IF Shift" parameter to 190 (125 for LSB). These firmware versions do not allow for different IF shift settings on a per-mode basis, so you must remember to change the IF shift setting in the menu when going from USB to LSB or vice versa.

Rev A.01.23 and later firmware fixes these problems by adding a separate menu item for Tx IF shift for USB and LSB. The relevant RS-232 commands are CU (Cal USB) and CL (Cal LSB). Also, the Variable Bandwidth Tx filter is defaulted to 82, which provides good audio response in both USB and LSB.