INRAD “Bonus” Mod for CW Hiss.
Lou W7HV

The INRAD "Bonus" mod is included with their “MP Front End Mod”. It consists of adding a .047 mF cap across C3015 on the audio board to roll off high frequency audio response in CW mode.

I did some testing of this mod on my MkV using an audio spectrum analyzer and my ears to make the comparison.

Prior to the mod, the radio exhibited an unacceptable amount of hiss without EDSP CW demod enabled. After the mod, EDSP demod is still better but the RX is reasonable with it off too. This is most evident listening to week sigs on quiet bands.

This mod only affects CW mode and then only when EDSP CW demod (menu 7-7) is turned off. On SSB, or on CW with CW Demod on, there is no effect at all. I did not check any digital modes.

The audio board is located on the bottom of the rig and C3015 is a through-hole film cap on the top of and close to the center of the board. I had some small clip leads I was able to attached to C3015 and use to quickly switch between several capacitor values including .022, .033, and .047 uF. All values substantially reduced high frequency hiss with .033 and .047 having similar affect. I chose to go with .047 and tacked it onto the bottom of the board.

Prior to the mod, in CW NOR (1800Hz INRADS) and with EDSP demod off, the passband was tilled downward toward higher frequency going down about 10dB at ~2400Hz compared to 800Hz. This is not really a problem on CW. There is also a noise floor that extends well beyond the passband cutoff. This noise floor is responsible for the objectionable hiss.

Adding the bonus mod has the affect of increasing the downward tilt of the passband so that it is more like 25 dB over the range 800 to 2400 Hz. This still sounds fine listening to actual signals because it only attenuates the sigs that are far above the side tone frequency. It also greatly decreases the hiss due to the noise floor above 2400Hz, but not to the same extent as EDSP demod.

EDSP CW demod has the effect of flattening the pass band so there is no drop-off toward the higher frequencies. It has a sharp cutoff at ~1800Hz that also takes out the noise floor above this frequency. This cut-off is introduced in the baseband so signals above this cutoff but still within the IF passband of the CW NOR filters will pump the AGC. When using wide filters, adjusting the Width control to align the IF passband edge with the EDSP demod cutoff solves this problem. For USB, rotate the Width control to about the 4 o’clock position.