

A REVIEW OF THE BHI AMPLIFIED NOISE ELIMINATING MODULE UTILIZING DSP WITH THE YAESU FT 1000 MP MARK V MODIFIED WITH THE INRAD ROOFING FILTER

THE BHI ANEM DSP MODULE



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THE AMPLIFIED NOISE ELIMINATION MODULE IS EXTREMELY COMPACT

The FT 1000MP Mark V transceiver, for all of its excellent qualities, suffers from a rather high noise floor, due to IF hiss. For several years, INRAD has produced a low noise IF amplifier module, which has been used successfully to lower the noise, and improve MDS. Recently, INRAD has offered a new roofing filter, or first IF filter with a low noise IF amplifier module to make up for insertion losses. I have found that the module more than makes up for the insertion losses, and results in several DB of net IF gain. This in turn allowed me to lower the IF

gain in menu 9-1 by several integers, and reduce the IF hiss. Unfortunately, the built in audio DSP in the Mark V, while reducing hiss, also reduces the speech clarity on SSB. I have found the "A" setting, the lowest noise reduction setting, to still muffle the audio. Clearly, some sort of modification was needed here, which should be as effective in noise reduction as the INRAD modules. Together, with the new INRAD roofing filter, and some effective DSP, the receiver would be finally VERY QUIET.

Friends in the UK led me to BHI, and their product line. Originally, BHI only offered circuit boards to mount in-board in your speaker console. Now, they have introduced a plug and play option in the ANEM. Plug audio in, audio out, and 12 to 18 VDC, and you are ready to try the module, hardly a few minutes of work. BHI even includes some cables to expedite the installation for you.

What does this ANEM do? Simply, it reduces the IF hiss and further lowers the noise floor. How much does it lower it? It appears to be at least 3 to 4 DB lower, while not effecting the recovered speech!

Does your reception suffer from TV high voltage switching power supply noise? The ANEM removes the broadband hash created by radiating television sets. This is an extremely common problem, and often goes unrecognized by amateurs. While your receiver's S meter will still indicate the low level signal from your TV, perhaps on 20 meters, the noise will be eliminated by the ANEM module.

But let me be perfectly clear that due to the nature of how DSP works, this module is not a noise blanker. It will not remove electrical impulse noises such as from lightning or electric fences. You will have to use your various NB adjustments for that. This will merely quiet the radio itself.

So what does this mean in practice? The ANEM contains a 2.5 watt amplifier, which does an excellent job of driving most any communications speaker system, and in fact I use the module to drive two speakers in parallel. Not only is the audio distortion free to my ear, but the module has a very good AGC system, and seems to not only work well over a rather large range of input voltages, but also effectively avoids overload from very strong signals. I find this aspect of the ANEM to be far superior to the old JPS NIR 10, which I have also evaluated with the Mark V.

In terms of what the ANEM does, it makes signals which are Strength zero sound like they are Strength four or five! I could never work the very weak signals without headphones, now even S zero signals are Q5 without the headphones. The signal to noise ratio is improved significantly, and this in turn results in much greater listening comfort and less fatigue.

My modified Mark V is so quiet, I can actually hear the phase distortion on some of the very weak signals. I can hear multipath echoes, and of course, the famous arctic flutter, even on S zero signal strengths.

In practice, you can experiment with various settings of the RF gain. Now, adjusting the RF gain to the higher settings, above 2 o'clock, does not significantly increase the noise floor! You can actually see the effect of the higher RF gain on the signal strength without increasing noise. If intermod is not a problem for your system, leaving the RF gain fully clockwise may work well for you.

An additional nice surprise is the improvement in the Mark V second receiver. This dual conversion receiver is far noisier than the main receiver. Here the noise reduction was truly amazing, far greater than my modified main receiver illustrated. It was easily several DB greater. I really didn't think the second receiver could sound that good, what a bonus!

The ANEM introduces very little delay in the audio, unlike the older systems. The delay is perhaps in the range of 25 milliseconds, and will allow you to still monitor your transmitted audio without becoming tongue tied. This is indeed a great PLUS for the module.

It was also noted that when transmitting, even while running the amplifier at full legal output, no speaker talkback was heard. Likewise, during transmit audio monitoring, no RF audio distortion was detected.

The ANEM has either four or eight levels of noise reduction which can be switch selected. I have used level 5 or level 6 to good advantage. There are no digital waterfall noises to deal with as with the old Texas Instrument chip technology in the NIR 10 unit.

The operation of the unit is very convenient, being microprocessor controlled. There are two small push button controls, on/off, and level selection, which determines if you are using any noise reduction and if so, at what level. There

is also a LED which indicates if the unit is turned on, and if noise reduction has been selected. The LED is red (if 4 levels of noise reduction have been selected) or orange (for 8 levels of NR) if the unit is on, but with no noise reduction engaged, and green if noise reduction has been selected.

If the unit is on, with no noise reduction selected, the AF amplifier is in the circuit and operating, with the noise reduction bypassed. Depressing and holding the level selector button causes the processor to step through each of the eight levels, which are signaled audibly by the internal sounder, one beep for level one, two beeps for level two, etc. The LED will flash green simultaneously with each beep. There are no dip switches to select, operation couldn't be more simple.

In practice, since there is no downside to the use of the ANEM at these levels, I leave it active in line at all times at level six. There really is nothing to adjust once you have picked your desired noise reduction level.

Full technical details and the operational manual are available via the BHI website. Please click on the ANEM picture above to reach the ANEM page.

Your questions or comments on your experience with the module are welcome. Thank you for reading my review.

73 and Happy DXing,

Mike
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