

# The Radio Hotel<sup>®</sup> - HF Receiver Basics -- S9 Band Noise???

By Rick Hiller -- W5RH

A few years ago we had a presentation at a club meeting about the technology change in transceivers over a 50 year period. Starting with the Heathkit HW-101 (a “one function per knob” radio) and then advancing to the Icom 746Pro, which 10 years ago was a fairly high end “menu driven” radio. We then finished with the “then” state of the art Flex Radio 3000- software defined radio. Quite a jump over 50 years, but the presentation had an alternate purpose in that it also explained what each knob’s function is on a typical transceiver.

Reflection -- Back when I started being an SWL, in the late 50’s, the HF radios were quite simple. On/off/volume control, RF gain, (maybe) regeneration, antenna tuning trimmer cap, a VFO or bandset and band spread. Sometimes AGC or more typical, AVC (automatic volume control), but the important thing is that each function was controlled by one knob, (except the on-off/volume). Nowadays you have a knob or button on the front of a transceiver that has 3 modes -- Quick tap or turn, brief hold and long hold. Each does something different. Couple that with the many, many functions hidden in a menu or multiple menus that you have to access and set. Hopefully, you are working with a bit of knowledge of what each of these many menu functions adjusts. If you look back at the BVARC newsletter, May 2013 -- [The Radio Hotel: “Visiting with the Elecraft K3 HF Transceiver”](#), a review of a modern day high end transceiver with lots of multi-function buttons and menu items to set. A general comment in the article about the radio’s extreme flexibility was that “you can adjust everything in this radio except the size of the box”. Ask any K3 owner, it is quite true.

My main point here is that radios have changed. They have become extremely complex in how they are controlled. Their function, however, has remained the same. They receive a signal, amplify it to a reasonable level and then detect it/demodulate it and output an audio waveform that our ears can hear. Pretty much all radios do that no matter how simple or how complex. Now, controlling the individual 4, 5 or more receiver stages of the modern radio with all of the available control functions or settings might not be so obvious to even the experienced HF radio user, as in my K3 experience. For a neophyte ham, it is ultimate confusion.

Back to reality (the abridged version).....2 weeks ago, I had a phone call from a new Ham. He was frustrated over his high noise level and wanted me to assist him in troubleshooting his “antenna problem”, which I did over the phone. He had already done the “battery powered transceiver and pull the power mains to the house” trick, with zero change in the noise level. I instructed him to do a few other basic antenna checks to ensure the antenna was functioning on receive, which it seemed to be. Nothing changed, so we then moved to the radio – an Icom 746 (non-pro). One obvious thing to me was that he was a new ham and did not yet understand all of the controls/functions of the radio and how they would influence his received signal. We started out with a band noise level of a solid S9. I discovered that he had everything ON and MAXED out. I had him turn off the NR – noise reduction, turn off the NB – Noise Blanker, turn off the 20 dB Pre-amp and then adjust the RF gain down to a proper level. Ta dah! He ended up with a band noise level of S3 – quite reasonable. He was then a most happy camper. At this point the radio receiver was at a basic set-up. I told him to use it as now set-up and don’t change anything until he read the manual to figure out what-knob-did-what and then experiment with each one. Also, I encouraged him to find some basic radio functionality explanation articles in QST or on-line...kind of like our club presentation. [Reference: [The Doctor is In](#) – ARRL Podcast May 10, 2017 “Optimizing Receiver Performance”] Look, I realize that he had been a Ham only 3 months, but the parallel is you getting your driver’s license and the first car you drive is an Indy car.

So, my suggestion for those just starting out in HF or those with weird problems that don’t go away, get your Elmer to show you how to set up your new HF radio properly. You’ll be glad you did, as it will make your on air operation most enjoyable and you’ll have more fun....and that is what it is all about.

GL ES 73 DE W5RH    Enjoy your hobby.

**Next time.... Broadbanding -- Nittany Lions Style**

