

In retrospect.....

Our SET in October went very well. We used the full Winlink 2000 System with various RMS stations to move traffic. Pretty much a “cake walk” as they say. In looking deeper we see that a lot of automated processes did a great deal of the work for us.

As we digress away from the automated help the work then falls back to the operators to do more in order to successfully move traffic. You can see by taking more and more of the technology out of traffic handling the human work load climbs. Eventually, if we take most of the automated help out we are left with Voice or even CW for handling of traffic. Both of which work very well but stress on operators gets pretty high if there is a lot of traffic that needs to be moved.

Although we want to try and not rely on technology we need to practice for different operating levels of automation. Most of us have accepted the computer as a fairly important piece of technology in the shack and feel somewhat comfortable about using it for traffic handling.

I'll admit there haven't been times when the 'blue screen of death' has caused us to pull out a few handfuls of hair. In general... it's a good tool.

Adding the computer to work with the radio can't possibly be bad thing if it takes some work off the operators. At least from our point of view it should be great. There are some basic problems we have to acknowledge in doing this. Radios- RF in particular does not get along well with computers. The further you keep them apart the better. By not getting along I mean that RF getting back into the computer will cause all kinds of (I was going to say funny) terrible things to happen. It will lock up USB ports, freeze software, render your mouse paralyzed, and in some cases cause it to shut down completely. All of this is counter-productive to trying to move traffic.

As ham radio operators we have graduated to having our computers control our radios. It escapes me as to why you tell a computer to set the radio on 3920 kHz instead of just reaching over and setting the VFO by hand. I'm not condemning programs like HRD or some of the other rig control software. They are fun but I do know some hams who can't get on the air if their computer is messed up. That part blows me away. (I'm not talking about the SDR guys; they're in a world all their own anyway.)

So what else have we added to our radios? There's the sound card gadget, the pactor modem, the external tuner, a phone patch, a VHF packet modem (if you have a DC to light radio), and of course the computer. Many of these devices usually have poorly shielded interconnecting cables. In short... antennas!

Remember when I said computers don't get along with RF? I'm sure you believed that part due to your own experiences. If you don't, I hope you have a full head of hair to work with. Trying to keep RF out of our 'peripheral' equipment... and computer can be a challenge. Some of you are saying... “they/I talk on SSB all the time and don't have issues”. That's true...the gray matter between your ears is not as sensitive to RF as some of our add-ons. If you get RF burns off your microphone or headset then you tend to believe you have RF in the shack and make an effort to clear it up. We need to do the same for our digital mode operations.

One ham told me he runs ladder line right to the back of his tuner in the shack which sits on top of his radio and he has no RF in the shack. Took him two weeks to figure out he DID HAVE RF when he tried to work digital modes. So where is the RF? Well if your antenna is within 40' of your shack you are getting some direct radiation from the antenna itself. Generally we can clean most of that up, however here's my story. My shack was on the back side of the house. Right outside the window in the shack was my 39' Rohn 25 tower. It was fastened to the peak of the roof with a bracket. From that tower I had a 3' stand-off that held my G5RV away from the tower. All worked fine on voice. On digital I had terrible distortion. My tuner matched the antenna so I had a 1.1:1 VSWR but yet I had problems on digital modes. First step was to buy a ton of ferrite cores. (You have no idea what an \$86 pile of ferrites looks like). I even installed line isolators in all my coax cables. But still didn't clean it up. Why, because the antenna was a mere 35' above my head.

I moved the same antenna 65' out away from the house to another tower and all was better. Everything worked just fine. This even improved the noise level since I got further away from some of my own noise sources. With the antenna moved away from the shack I could then concentrate on that portion of the RF what was coming back down the feed lines. It was easy to fix.

I removed all ladder line from entering the shack. I terminate them out 'away' from the house with baluns and run coax inside. I try to use resonate dipoles or loop antennas so as to minimize mismatches that might cause common mode currents from coming back down the feedlines. Common mode chokes help a lot but are not 100% effective if you have a bad match.

Having taken all these steps I have little or no RF getting back into the shack and showing up on my digital/analog accessories. I have since moved away from 'multiple band' antennas like the G5RV or the 135' dipole fed with ladder line and a tuner. Removing any excuse for RF to come back down the feed line helps. I had similar problems with the RMS antenna. I have since gone to a Fan-Dipole with resonate elements on each desired band. No tuner needed to cover 80, 40, 30, and 20 meters. Your particular situation may dictate using a G5RVÉ if so, try to keep it as far away from your shack as possible.

OK, so you think you have most of your RFI problems resolved are there any other things you can look at? Sure reroute your audio/digital cables away from any RF cables. For one ham just moving his audio cable 2' away from his RF coax cleaned up all his problems. Don't bundle them all together to make it look neat. Wives like "neat" but this is one time they'll have to be a bit understanding. Make sure you have good grounds. I found my Signalink USB had a floating ground on the case. An alligator clip lead fixed that. Next time I have the box opened I'll make a permanent fix inside. Keep your leads as short as possible. One ham had a 12' USB to serial adapter cables talk about a great antenna. Using a shorter adapter cable and a ferrite fixed his problem completely.

So what other things do we need to look at? The radio itself is fair game as well. If you have a newer radio with lots of bells and whistles be sure to TURN OFF most of the fancy stuff if using an SCS modem or modem with a DSP chip. The SCS modems have a dedicated DSP chip that is running specifically to clean up signals for pactor. Adding your radio's DSP stuff on top

defeats the purpose. No NB or NR or narrow filters. Pactor III needs 2.7 kHz filters. Don't select the default 'digital' mode filters on some radios. They can be too narrow for some digital signals.

Set your AGC to FAST. You need a fast response from the AGC circuitry in the radio. Slower AGC may make voice sound good but doesn't work well for digital work. Make sure your COMPRESSOR is OFF as well. Compressors have a tendency to overdrive the RF stages in a radio. It's not noticeable on voice but raises heck on digital stuff. For pactor operation set your radio to 90-100 watts output power and then adjust the audio level from your pactor modem to get 65-70 watts or so RF output. Keep an eye on your ALC. The lower the ALC reading the cleaner your signal will be. A clean weak digital signal will move much more data than a strong dirty one. If you don't have a spare receiver to listen to your signal have someone else do it and find out if you have distortion or a dirty signal. What about noise? An S9 noise level is not going to move a lot of traffic. Especially if the band is marginal and signals are peaking S5-6 at best. Try to eliminate the noise. I was able to drop 4-5 S units of noise by going from a dipole antenna to a full wave horizontal loop. I put up the loop and 3 weeks later took down all my dipole antennas and gave them away.

Check your house for noise. Operate your radio on battery and note the noise level then go outside and shut off the main disconnect to the house at the meter. If the noise level improves you've got noise' and it's time for a noise hunt. I threw out a 2 month old fax machine because it was making about 3-4 S units noise on 80 meters. My wife's wall wart charger for her HP Laptop was making about 2-3 S units of noise. A different (newer) charger fixed that. You may say 'yeah but it's only 2-3 S units' but they all add up. What if your house is clean and you have noisy neighbors? Good question. You can try a magnetic loop antenna like the Pixel. Several hams have had GREAT successes with them and can now 'hear' the nets on a regular basis. My Pixel was able to get around the S7 noise my neighbors treadmill made. Fortunately for me his motor eventually burned out. The Pixels do work.

A quick note on Winlink or WINMOR P2P:

If you ever noticed when using an RMS your station will try to connect for 15-20 seconds before giving up. The reason is that RMS stations are scanning a list of frequencies and it often takes 20+ seconds to make it all the way around the list. In P2P mode you don't need to let the radio try to connect for 15-20 seconds as a time. If the station is there it should answer in 3-4 attempts. There is no sense in tying up the frequency up for long periods of time trying to connect. If you think they are not there, wait a couple minutes and try again but don't let it try for 15-20 seconds at a time. It goes back to the whole criteria about P2P- They have to be on the air, on the right frequency, on the right mode. If they're there- they will answer almost as soon as they hear your signal. Think about it.

Digital is a whole new world for operating. It's fun and frustrating at the same time. Making a few PSK31 contacts on Sunday afternoon is not as stressful as trying to pass critical traffic. Anything we can do to make the critical experience easier makes the casual experience much more fun.

We need to keep at it. We learn something new each time.

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