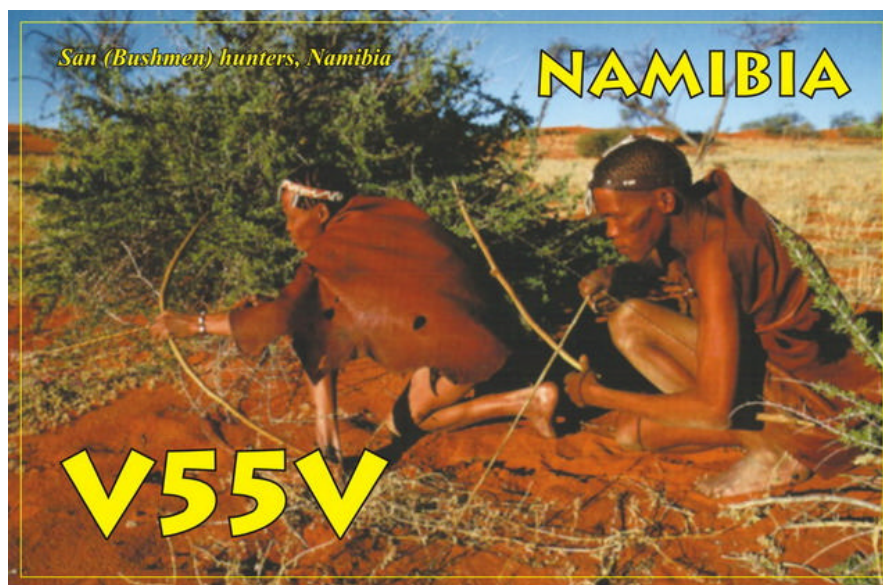


## LOW BANDS AND HOW TO PULL THE WEAK ONE OUT BURIED DOWN IN THE QRM



Bushmen in the African Kalahari desert are one of the best hunters in the world  
DX: It is all about hunting....

by N3CZ

This paper is about receiving and being able to pick up that weak one sitting just above the noise level or buried in a huge pile-up on frequency and at the same time being able to cope with the presence of the static noise and all kinds of other QRM. These tiny signals are often a frustration to copy and put hams off this subject easily, especially in cases where the antenna restrictions are in place and the tall tower with the “super antenna” is not available. Even then sometimes or lets say more often signals are too weak to just relax and pull them out easily. This applies for both SSB and CW, although CW is easier to copy because you are dealing with a single tone that you have to focus on. Most of the methods described here apply mainly for CW but they can also be used with SSB signals with great success. In general all these “tricks of the trade” can be used on any band not just the low bands. Life is easier when station use “split operation” but when you have a weak one operating simplex? You have to be prepared with everything you can to be able to copy almost any signal no matter how weak it is or how bad the QRM is.

So how it is done? Like with any other techniques, most of the hams developed their own methods and “tricks” to make weak signals readable. You want to know what “tricks” I am using? Here they are – no secrets really, and you may find some that you have tried already, but maybe some you have never thought of using.

1. Use the **RF Gain** on your receiver. Specially applies to the low bands. Dropping the gain of the receiver helps get rid of the static noise and in most cases helps improve the Signal to Noise (S/N) ratio and deliver that weak one clearly so you are able to copy the signal. This is my favorite. I always use this method especially on 40m which is my kind a band, where the CW portion is narrow and it is cramped with a lot of signals, local and DX at the same time.
2. Have you tried using your **RX filter** in the radio? Maybe you have tried using a narrow filter all the times and did not think of trying to open the receiver and set it to **wide** so to make the “pipe” larger in diameter and more signals pass thru. Hmm, maybe this sounds strange, but it does work for me, mainly in the contests and especially if you are the one running CQ. Yes, try it and you will see the difference. If your filter is set to narrow all the time you may miss a good multiplier or you are not able to “find” it in that huge pile-up. As a guest operator at one super station I was asked why I was not using the expensive optional RX filters. Well I found them not necessary for contesting. Why you may ask? The filtering is done by the operator and the way it is done is by simply pick up the signal and focus on that carrier. Using your Ears and Brain listen for little bit, call the station and continue listening staying focused on that one you need. It takes a little practice but you will be amazed how well this can work for you once you have it under control. No matter how many other stations are calling the DX on that simplex frequency you have a chance to pull it out.....
3. Well how about trying the exact opposite of what I described in step 2? Yes, if you never played with your **narrow filter** in the receiver, give it a try it may work for you. This works better for SSB.
4. **IF-Shift** is next on the list. Yes you guessed correctly. This is what makes those unwanted signals disappear of your operating frequency. Of course with some limitation...What happens with the IF shift: You are in control of the horizontal and the vertical...no just kidding, only horizontal maybe. It is basically controlling the band pass of your receivers IF stage. You have this so called “pipe” that lets the signals thru, but now you can make it wider or narrower or completely move it to one side and then to the other. So if your signal was somewhere in there, but the QRM was also near by, by moving the IF Shift “left” or “right” you will get rid of the unwanted QRM and you will in most cases improve by 60-80% the ability to copy that weak one.
5. **Notch filter:** You have always wondered what this control does. Have you tried it? Here is the secret: RX Notch filter in most radios works in the audio stage of the receiver and basically it’s purpose is to notch-out the unwanted interfering carrier in close proximity to the receiving weak signal and deliver you a nice and clean copy. Usually this is in hundreds of Hz or of to 1.5Khz. There are AUTO NOTCH and MANUAL NOTCH filters. Use the manual notch filter. This is how I do it: say I am on 160m and there is a very rare station is on. This signal is so weak and plus all the other stations calling ...boy it is almost impossible. But

wait, you have to be patient that is the essence delivered in this text as well. Activate the notch filter and try adjusting its frequency. Wow...what just happened? Frequency changes a bit and some of those stations that were continuously calling on frequency just disappeared. Yeap...if you continue tuning the notch knob, you will notice that you are able to really get down and very "close" to the signal you wanted to copy. And yes it takes time but this works. Actually by adjusting the notch, at one point you will notice that even the noise is almost gone. At this point you are very close to the signal you are looking for. Move the knob further, but very slowly now and there you go...the uncopiable signal before has been made copyable. This needs some practice (like everything else).

6. How about varying the **RX VFO** while you copy that weak one...Sounds strange? Varying the RX VFO? Come on you say, you must be kidding me. Believe me this is THE SECRET TOOL and it may take a lot of practice and you may not be able to use but I have to tell you about it. So, this is how it goes: You have been calling the DX for some time and he came back to you or you think he did and you picked up bits and pieces of your call sign but others make it almost impossible for you to complete the QSO. All these stations, why do they keep calling? Nobody knows that, but remember that we also create the same QRM for them, so it is not the end of the day. But we have to use this tool now. And here is the DX calling you back.....and all the other signals on frequency... You think that this is going to be impossible? Maybe, but just wait till you give it a try. Before you do anything LOCK your TX frequency (use the second VFO and press A=B, this will equalize both VFOs). Now you can start moving the dial of your radio...sloowly...up and then down. Can you focus on the signal? Try it again...sloowly up then down. You will forget the others who are calling at the same time as the DX, because you are now focused and all you need to hear is your call sign and the report so you can reply back. You did it. You were able to copy this station hidden behind that terrible QRM. To practice this, go and work in one of the big DX contests. Again, it may take you some time but believe me this is the tool that may deliver that new one for you.
7. **Attenuator:** This control of your receiver is also very useful. Its function is basic but the improvements of the signal could be tremendous. This one is especially effective when there is a lot of static on the band. Some receivers have different levels of attenuation between 6dB and 20dB. Use it, its there for a purpose.
8. **Antenna:** This one is really simple. Try using different antenna(s) when you are in receive mode and having trouble with the weak one. Different antennas exhibit different behavior and have better S/N ratio so it may help with the reception.
9. **Disconnect your antenna:** Ouch! How are you going to receive at all? Well this one is interesting and really applies when you are the DX and trying to work all those stations calling you. Here is a scenario: You are running an amplifier and a footswitch to key it up. You call CQ and like a solid wall of concrete they all

come back to you at the same time, even if you are running split you are in trouble. Guess what happens when you disengage the antenna by activating the footswitch. Yes, just key the amp while you are in receive mode. What happens is that only the very strong ones will make it through. Does it matter? Is it fair to the weak signals? Not really, because it is about your ability to work them all. You work the strong ones, then the weak ones will be left over and you will deal with them later. Remember from earlier “You are in control...”

10. **Turn down your rigs TX power:** Again this one applies only if you are the DX station. When and why would you turn your TX power down: Say you call CQ and again the wall of stations calling you hits you all at once. Hmm, what can I use...let me try dropping my TX power down to 20W or something. After few CQ's you will notice that calls are dropping. People realize that you may have gone from frequency and now only those with good antennas and “ears” will be able to copy you. Well you work them first like described earlier, and then when the pile-up get cleared you turn the power up again and continue working. Again is this normal or fair to those with small antennas and bad ears? I don't think so, remember it is about you picking them up from that pile. You are the DX and if they can't copy you they shouldn't be calling you so there is less QRM on frequency. I used this one while operating as V55V in CQ WW SSB 2004. It worked so well that I managed to pull out around 3500 QSOs that weekend.

All these methods described here can be mixed and matched and used almost anytime. There are probably many other techniques and you would like to share them with others too. And you know what? Don't never-ever assume that your station is not capable of getting that rare one while fighting the big guns. It is the timing. Once you get used to it you will master it and this will open a whole new world of possibilities. Drop me an email if you have any questions: [n3cz@arrl.net](mailto:n3cz@arrl.net)

73,

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