Newcomers and Elmers Net: QRP 9-14-14

The definition of QRP, recognized by most amateur organizations, is 10-W input, or 5-W measured output. Five watts may not sound like much to those who consider 200 W low power, but the difference is not as great as you may think. Under actual conditions, 5 W will have little effect on your ability to work DX. The difference between QRP and, say, 200 or 2000 W is only 3 or 5 S units. Also, QRP exemplifies the spirit of the Rules -- specifically 97.67(b), which states that " . . amateur stations shall use the minimum amount of transmitter power necessary to carry out the desired communications."

Choosing an Antenna

A major failing of both experienced and novice QRPers is the antenna system. Unfortunately, most hams think low power equates with poor antennas. Many QRP operators seem to delight in using their rig with a 50-foot piece of wire thrown out the nearest window.

The basic rule of QRP antennas is that nothing beats a beam; and nothing beats a beam on a tall tower. Put up the best beam/tower combination you can afford. A good 3-element beam and 40foot tower will put you on a more-than-equal footing with those running 200 W to a vertical.

A good full-size dipole is the next best choice. On 20, 15 and 10 meters, a high dipole exhibits directivity, so place it broad-side to the desired direction of radiation.

Related to the dipole, and almost as easy to construct, is the single-quad loop. This antenna is more directive, has wide bandwidth and can exhibit up to 2-dB gain over a dipole.

The poorest choice for the QRPer is the vertical antenna. The vertical suffers two defects when compared to a dipole. It is highly susceptible to man-made QRN, notably power-line noise. For a vertical to have the same radiation efficiency of a dipole, a good radial system is required. Amateurs lacking space for beams or dipoles might consider the Cushcraft R-3 tuned vertical, which requires no radials and approaches the efficiency of a half-wave dipole.

Do not skimp on the coax. Use the best grade of RG-8 you can afford. We are not interested in power capability, but in achieving the lowest attenuation possible. The ham with an amplifier will not miss a couple of watts heating his coax as much as the QRPer running 5 W will. For portable operation, RG-8X may be used where its light weight and ease of handling offset the increase in attenuation. Make all connections clean and

weatherproof. Strive for the highest possible efficiency in both feed line and the antenna.

First, and most important, listen before using your key or mic. Is he working stations by call area or at random? Is he picking up tailenders? Is he listening high or low, and how wide is the split? All of these things can only be learned by listening. Spend five, even 10 minutes on your receiver before you begin to transmit.

Third, on phone, use standard phonetics. The ham on the other end doesn't have time to figure out cute call signs, and will ignore you. In addition, use some form of speech processing to boost your average power, but don't overdo it. Too much is far worse than too little.

Fourth, time your calls. This is most important for QRP operators. Don't try to be first to hit the keyer or PTT switch. Normally, everyone will send their calls all at once, pause, then try again. When you hear that pause, slip your call in just once. That's all you have time for. Do this correctly, and you may get through on the third or fourth call.

Finally, know when to quit. Everyone has days when the propagation is wrong or Lady Luck is against you. Believe it or not, the world will not end if you fail to work the DX in that pileup.

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you will hear things normally - s9 on a regular radio is s9 on a qrp radio; RX is the same
the difference is what you do with what you hear - how you learn to listen effectively
-- I have learned to listen effectively, because while I usually use 100 watts, I have compromised antennas which eat up some of the signal that I might normally put out; this means I have to work smarter and harder, just like qrp
-- in fact, sometimes it is fun to turn regular power down to the lowest setting (which on most radios today is 5 watts or less), and see what you can work
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sign your call with /QRP. This may cause stations to call you out of curiosity. The idea is to let everyone know, up front, why you're not 40 dB over S 9

The single-most-effective QRP operating technique is search-and-pounce. Search-and-pounce is simply tuning carefully through each band until you find a station to work. Most of the stations you work will be calling "CQ, " or you will nail them as they finish a QSO.

Work the station with a moderate-to-loud signal. Since the sensitivity of most QRP receivers outstrips the effective range of their transmitter, a signal that is very weak may be impossible to work. Propagation is a reciprocal thing, and if the station on the other end is S 1 running a kilowatt, imagine what 5 W will sound like. Actually, there will be no sound at all - you simply will not be heard. This condition is more prevalent on 80 and 40 meters, where antennas and propagation tend to work against the QRPer.

A fact of QRP life, and one of its more frustrating aspects, is that you are going to get stomped on occasionally - whether it's deliberate bad manners, carelessness or simply that the station firing up on frequency can't hear you. Sometimes, you can operate through the QRM, but generally it's the end of the QSO.

Another prime requirement for being able to work DX (or anyone else) on a consistent basis is at least a working knowledge of propagation. All of the major amateur publications have monthly propagation charts

The three bands providing the bulk of activity for QRP are 20, 15 and 10 meters. When the 10 meter band is open, there is little difference between 5 and 500 W. It can exhibit rapid shifts in propagation, however, which can be disconcerting to even experienced hams. Twenty meters is the most consistent band, providing openings to some part of the world day and night.

Another rule for the QRPer is to work the MUF (maximum usable frequency). Work the highest frequency that is open in the area you want to cover, based on WWV or other propagation information. Operating at or close to the MUF reduces path loss and maximizes your 5-W signal.

Here's a neat experiment that will introduce you to the realm of QRP operation in a gradual fashion: cut your maximum output in half and operate at that power level for a week or so, then cut it in half again. Continue cutting power until you're down to 5 W. I'm sure you'll be surprised, as I was, at how well you can communicate with reduced power. In many cases, the operator on the other end can't tell the difference.

One of the primary skills QRP operation strengthens is patience. With QRP power levels you have to wait for the right moment and make your move. This means you must be alert and listening rather than transmitting. You have to be familiar with the bands, operating procedures of DX stations and other QRP operators. All this takes a bit of patience, practice and listening.

HomeBrewing
The QRP arena is one of the few places where the average home-brewer still can make a decent showing. In this age of multistage, integrated circuit, super-sophisticated all-mode transceivers, QRP operation stands out as a home-brewer's dream. How many hams can hope to duplicate the operation of the latest HF transceiver on their workbench? Probably none. If, however, we change the rules by restricting the power output, it is certainly possible for nearly anyone with the ability to obtain a ham license to build a 5W transmitter.

QRP transmitting equipment is simple and physically small. The same can't always be said for the receiver, however. A QRP receiver must do the same job as any other receiver, while usually in a smaller box. It is certainly possible to build an adequate QRP receiver by using minimal circuitry and integrated circuits-but it's not easy to duplicate a top-of-the-line commercial receiver in a matchbox.

If you are interested in home-brewing, but haven't actually done much, I would suggest the QRP transmitters as a good first project. QRP transmitters usually consist of a few transistors, and for HF work, the layout is not particularly critical. Probably the toughest part is finding or building the coils and chokes. Even the coils are not a big deal once you've wound a few. Schematics and kits are readily available. They make it easy to get started. After you've put together a kit or two, it'll be a piece of cake to move on to "bigger and better" projects.

Material here is mostly from ARRL.org resources

QRP Clubs

American QRP Club

QRP Amateur Radio Club International (QRP-ARCI)

Web Links

NOGA *compendium of the best 14 club projects, and kit ordering information.*

Totally QRP

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