

Technician Licensees -- Why Not Try Low Power HF CW?

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Ron Stone, KA3J

Would you like to contact hams around the world using a simple antenna and a radio that isn't much larger or more costly than a VHF/UHF handheld? If you're willing to invest a modest amount of time to develop some new skills, consider using low power HF CW. What follows will prepare you for a successful introduction into this exciting facet of ham radio.

Why Learn CW?

Simply put, CW is a highly effective, engaging and elegantly simple mode. Relative to phone (SSB), CW can provide a 12-17 dB advantage – that's 2-3 S units! This means that a 5 watt CW radio can be as effective as a 100 watt SSB radio. While some digital modes (e.g., PSK31, JT65) are even more effective, a computer must handle encoding, transmission and decoding. This adds some cost and complexity and removes you a bit from the action. With CW, you handle the encoding and decoding which also enhances your sense of accomplishment. Plus, CW is conversational like phone and you're likely to enjoy the camaraderie that CW operators share.

CW's unique and rewarding user experience has resulted in its continued popularity. A quick tune across the bands will confirm this. Or, take a look at contest statistics. During the 2013 Field Day, CW provided 42% of the total QSOs, phone – 54% and digital – 4%. Similarly, during the 2012 Sweepstakes there were 500,739 CW QSOs and about 575,000 phone QSOs.

Is CW Difficult to Learn?

An eHam survey (5/6/2001 [click here](#)) indicated that about 80% of hams could learn it without too much trouble and most either found it easy (16%) or challenging but fun (47%).

To find out how it would be for you, spend an hour or two using one of the excellent, free training programs. These programs can be found on [lcwo.net](#), [justlearnmorsecode.com](#), [G4FON.net](#), and on other websites. If you enjoy the first few lessons, continue. Even if you find it a bit tough, keep one thing in mind. Some hams who struggled learning CW or even hated it initially now love it and use it almost exclusively.

Will Learning CW Require a Lot of Time?

The Navy's former training course required 80 hours to achieve a fairly high level of proficiency (18 WPM) and included learning to type. The time you'll need to become sufficiently proficient to get on the air will likely be somewhere between 40-60 hours. This is probably just a small fraction of the time you spend on the hobby in one year.

What's the Best Method for Learning CW?

You'll find a variety of theories and gimmicks on the Internet about how to best learn CW. In the end, it all comes down to learning the sound of about 40 characters (letters, numbers, and punctuation) and a few special symbols. The Koch method in combination with Farnsworth timing, which is incorporated into the training programs mentioned above, is a widely accepted approach.

To begin, try to practice about a half-hour every day. You'll learn one new character at a time and your initial character speed should be no less than 15 WPM. You can set the Farnsworth timing to increase your character and word spacing to reduce your effective speed to perhaps initially 6-8 WPM. This approach forces your brain to focus on the sound of each character rather than individual dits and dahs while providing you time to recognize and record each character. After you achieve at least 90% accuracy with a new character, you should adjust the Farnsworth timing to increase your effective speed. You can begin practicing sending at any time.

Does Low Power (QRP) Offer Significant Benefits?

While QRP (5 watts or less) won't appeal to everyone, an eHam survey (7/6/2007 [click here](#)) indicated that about 50% of hams use QRP at least part of the time. You may want to consider using it for one or more of the following reasons:

It can substantially reduce the cost of your station.

A new entry-level 100 watt HF multi-band, multi-mode transceiver with power supply will cost at least \$700 - \$800 (e.g., Icom 718, Yaesu FT-857) while a decent used radio and power supply will cost at least \$400. QRP single-band crystal controlled transceiver kits start as low as \$40 (e.g., RockMite – [qrpme.com](#)) or around \$100 for a single-band radio kit that is tunable (e.g., MFJ 9340K, TenTec 1340). A new, assembled single-band QRP radio will cost \$150 (e.g., MFJ 9340W) or \$200 for a multi-band radio (e.g., TenTec 506 Rebel). A small power supply or set of rechargeable batteries with charger will run about \$40.

You'll also need to spend about \$70 for coax, wire, rope, connectors, and homemade insulators to build a simple antenna like a dipole. Some portable antennas will cost a lot less because little or no coax is needed. In addition, you'll need a paddle or straight key that will cost at least \$30 - \$50 (see [electronicsusa.com](#), [vizkey.com](#)) unless you build your own. For example, my almost no-cost "paddle" consists of two momentary tactile switches mounted on my handheld radio or on a prototype board.

You can find many other equipment choices and learn about their strengths and weaknesses in the eHam product reviews.

It facilitates operating portable.

QRP is quite popular for portable operation because the equipment is very small, light and energy efficient. In fact, many hams use QRP just for this purpose. For example, I use my homebrew 1 watt 20 meter handheld radio with an 8 foot whip antenna at my favorite beach in Florida (see my qrz.com page for details: [click here](#)). This past winter, I operated about 45-60 minutes per day on 82 days, had 222 QSOs and worked 34 states and 47 countries including Australia 7 times.

It may provide a more thrilling experience.

This is the key factor that may drive your interest in QRP. After using typical 100 watt radios for 28 years, I needed a new challenge and decided to homebrew a radio. I built a very simple 2 watt, 40 meter QRP transceiver that I used with a dipole up 50 feet. My initial low expectations quickly vanished as I casually worked all states and 86 countries while having many fine rag chews. I almost always made a contact within 15 minutes of turning the radio on.

QRP brought back the magic of radio for me and made operating exciting again. Now, 18 years later, it still amazes me that I can often communicate over thousands of miles with a simple antenna and a radio that fits in my pocket or hand. Every QSO feels special especially when I'm using a radio I built. This feeling is magnified when I operate portable, work a rare station in a pile-up, have a great rag chew, or work other QRPers.

So if you really enjoy developing your skills and seeing what you can accomplish with minimal gear, QRP may be for you.

Can a Beginner be Successful with Low Power?

Many hams, including QRP enthusiasts will tell you “no”. The concern is that a beginner will have difficulty making contacts and quickly become frustrated. However, this will not occur if you adopt the right attitude and approach. AK4YH discusses his approach and success in his eHam article: Starting Ham Radio, The Road Less Taken (2/22/2014 - [click here](#)). It is interesting to note that entry level HF licensees are required to use low power (10 watts) in some countries, including England, Japan, and Australia. Here are some suggestions that will help ensure your success.

Adopt Reasonable Expectations

Be mindful that your signal will be at least 13 dB (about 2 S units) weaker than many. This means:

- You will not be able to contact every station that you hear
- Your CQs will not usually be answered quickly.
- You will need to be very patient and may not always be successful when trying to work a rare station in a pile-up.
- When conditions are poor or a particular propagation path is marginal, a contact may only be possible due to the more capable station and trained ears on the other end.

Use 40 or 20 Meters and Operate when Conditions are Most Favorable

The most popular bands for QRP are 40 and 20 meters because they have the most activity, good propagation throughout the solar cycle, and reasonable antenna size. To operate on 20 meters, you'll need to upgrade to General which only requires about 10 hours of studying (source: hamradiolicenseexam.com). This is well worth the time because 20 meters is great for day-time DX and portable operation. Also, a 20 meter antenna can be half the size of a 40 meter antenna and be equally effective at half the height. The upgrade will also give you access to other bands that are good for QRP.

It's best to operate when there is plenty of activity on the band and when propagation can best support a QRP signal. I've had good success on both 40 and 20 meters during late afternoon and early evening and on 40 meters well into the night. You'll need to determine what times work best for you in your area. Use reversebeacon.net to find out where and how well you're being heard at any time. Even with very low power (< 1 watt), you'll often be heard at least at one distant reverse beacon location.

Put Up a Good Antenna At Home or Go Portable

A simple center fed dipole probably offers the biggest bang for the buck if you can support it reasonably high, preferably 35 feet or more for 40 meters. Other options include an end fed half-wave dipole, a random wire with a tuner, or a vertical with a good set of radials, to mention a few. Some options may cost a bit more but offer multi-band capability.

If you can't put up a decent antenna at home, try operating portable. Ideally, select a nice electrically quiet location like a beach, park or mountain top (see: [Summits on the Air program – click here](#)). At these locations, QRPers have good success using a shortened vertical with a counterpoise, or a random wire or other end fed antenna thrown up in a tree or supported with a collapsible fishing pole.

Use Search and Pounce or Call CQ

The quickest way to make a contact is to search for stations calling CQ or that are just ending a QSO. As you tune, listen for stations with loud signals and minimal fading as they will likely hear you best. Also, be aware of weaker, low power stations near the QRP frequencies (e.g., 7.030 MHz, 7.040 MHz, 14.060 MHz) that are likely to hear you too.

Search and pounce will work best if you can copy stations at their speed – typically, 15 – 20 WPM. If you can't, when you respond to a CQ ask the station to please slow down (PSE QRS) as follows using your call sign (e.g., W3XYZ): PSE QRS DE W3XYZ W3XYZ K. You'll recognize that a QSO is ending if you can copy a common ending phrase like 73, cuagn (see you again), or cul (see you later). Then try to copy at least the station's prefix (e.g., W5, KA3, etc.) and call as follows: KA3? KA3? DE W3XYZ W3XYZ PSE QRS K.

If your speed is initially much slower than most stations, or if you're using a crystal controlled radio, you'll need to rely more heavily on calling CQ. This works fine but it may sometimes take

twice as long, perhaps 30 minutes or more, to make a contact. Using a keyer that can send CQ automatically can reduce the effort. Try operating on or near the QRP frequencies, listen for activity first and then send QRL to make sure the frequency isn't in use before calling CQ.

Ask for Help When Needed

You can receive helpful guidance and encouragement and get questions answered on various QRP-related forums located on eHam, Yahoo Groups, and on QRP-L [click here](#) as well as from QRP organizations such as QRP ARCI, Four State QRP Group, NorCal QRP Club, and others. There are also a variety of helpful CW-oriented clubs including the Straight Key Century Club, Fists CW Club, CW Operators Club, and others. Local ham club members and the hams you contact on the air can also provide assistance. Ideally, try to find a mentor in your area who can show you that operating QRP isn't difficult and can help you get your station on the air.

Conclusion

If you can be patient while developing your operating skills, low power HF CW can provide a very rewarding experience. You may be amazed to discover what can be accomplished with very simple gear. Low power CW can provide a low-cost entry into HF for Technician licensees and can be enjoyed by others as well.

So are you ready to begin your low power HF CW adventure?