Morse Code

On-Air Training
Idaho Falls Bishops' Storehouse
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Introduction

A couple months ago we sent out a survey about antennas. Many of you responded. Thank you. At the end of the survey, we asked what else you wanted to hear on the air and some of you mentioned Morse code. So, I want you to know that we listened and tonight we're going to talk about Morse code.

Morse code is an alphabet or code in which letters, numbers, and punctuation are represented by combinations of long and short signals of light or sound. It got its beginnings in 1836 when Samuel Morse and a couple of colleagues developed the electric telegraph system. The system sent pulses of electrical current down a wire to an electromagnet on the receiving end. The electromagnet controlled an armature that made indentions on a scrolling paper tape. Receivers could translate the code from the grooves and ridges on the tape. As fate would have it, the armature clicked as it raised and lowered on the tape and operators soon learned that they could interpret the code directly from the clicks.

The code we use today is quite different from that originally developed by Morse and his colleagues. Today's code, although based on the original, was created by a German named Friedrich Gerke in 1848 in which he modified nearly half of the original characters. With a few minor modifications, the ITU adopted Gerke's code as the international standard in 1865. In the 1890's, the code began to be used extensively for early radio communication and was very common by the 1920's.

In the amateur radio world, Morse code is commonly known as CW (charlie whiskey) which is an acronym for Carrier Wave. That's how Morse code is sent over radio waves. The radio generates a single tone or unmodulated carrier wave. The carrier wave is interrupted by a switch, a Morse code key, which turns the signal on and off for short or long durations. A short duration is known as a dit (delta india tango) and a long duration is known as a dah (delta alpha hotel). The dits and dahs are combined to form letters. Spacing between the dits and dahs is as important to interpreting the code as the dits and dahs themselves.

For example, the letters ERC would be sent by transmitting a dit to represent the letter E, then dit-dah-dit to represent the letter R, followed by dah-dit-dah-dit to represent the letter C. It sounds something like this: [play the ERC sound file, ercmorse.wav]

Due to modern technology and the advent of robust digital modes, Morse code has lost a great deal of popularity. As you know, it is no longer required to pass the element one code exam to receive an amateur radio license. However, W1AW still transmits daily code which you can copy and submit to receive a code proficiency certificate.

We're only five minutes into this and some of you might be thinking that there is no longer a need for Morse code. What's the point? I'm never going to use it. You're all familiar with the mantra, "When all else fails…amateur radio." Well what do you do when the voice signal just won't get through? Morse

code can often break through the QRM and QRN when nothing else will and then with less power. KB7ITU Steve, will you share your experience with the Australian QSO?

Thanks, Steve. You never know when CW will be necessary. Like most things we talk about on this net, this is another communication tool you can put in your belt.

Learning CW

Let me share a couple of thoughts about learning CW and then I'd like to get some additional ideas from the net.

There are two general methods for learning CW. The first is credited to Russ Farnsworth K6TTD. The Farnsworth method transmits the letters at the target speed, say 20 words per minute, but the spacing between the letters and words is greatly increased to allow your brain thinking time to recognize the letter. The spacing is gradually decreased until normal speed is achieved.

The second method was developed by a German psychologist named Ludwig Koch. The Koch method sends at the full target speed with normal character and spacing speed, but lessons begin by learning only two letters. When you reach 90% proficiency, a third letter is added, and so on until the entire code is mastered.

Technology is our friend. It is the Morse code element that prevented me from getting my license 25 years ago. When the code requirement was dropped and I did get licensed, I gravitated to CW and quickly became fairly proficient with the help of modern tools.

There are a number of web sites that I think are really good:
LCWO.net – create an account and track your progress
AA9PW.com – allows you to generate practice files you can download and listen to offline.
MorseCode.nl – lots of documents, hints, and tips for learning the code and increasing your CW speed.

I personally employ a number of Windows applications, too.
RufzXP is my personal favorite for practicing call signs. I use this app to improve my character recognition and push the limits of my comprehension
MorseRunner simulates a real world conditions in a contest environment.
I used Just Learn Morse Code early on to learn the code. It's a versatile application, but has a daunting number of settings. Great for practice, though.

I also have an app on my iPhone called Ham Morse that can help you learn the code. I use it while I'm driving to listen to simulated QSOs. I can adjust the speed to wherever I'm comfortable or dial it up to push me a little.

I would recommend finding a friend or Elmer to practice with. I think a seasoned CW operator is the best (and most are willing), because they can help correct, adjust, and improve your fist. (Fist refers to your style of sending. Like the way someone talks, or walks, or like fingerprints—the way you send CW is unique to you. Old timers can recognize others they regularly communication with just by the sound of the code. This is known as your fist.)

Above all, nothing aids your comprehension like the real thing. I can temporarily increase my receiving speed by 10 words per minute in a single weekend just by participating in a CW contest. Listen to CW QSOs. Listen. Try to recognize letters. Then try to form the words without writing down the letters. Listen. Listen. Listen.

What other ideas does the net have to learning the code?

Sending CW

Now that you've learned the code, how are you going to send it? There are four primary types of Morse code keys. We call them keys, but they are basically just the switch that turns the carrier wave on and off.

From the early days, the straight key has been quite common, especially among beginners and purists. You push down on the lever. It makes contact and closes the circuit. Most are spring loaded so that they automatically rise when the pressure is released, breaking the circuit. The dits and dahs are determined by how long you keep the lever pressed down.

Figure 1 Straight Key

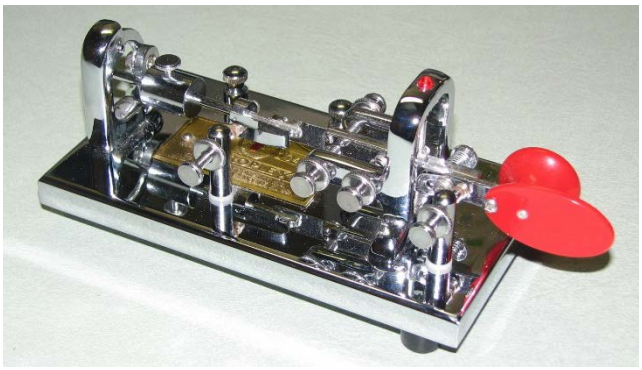

Figure 2 Bug

A bug is similar to a straight key, but the motion is side to side rather than up and down. Some bugs are semi-automatic. You can hold the lever to the right and a continuous stream of dits will be sent, but to send you a series of dahs, you have to press to the left and release for each dah.

Iambic paddles are two vertical paddles that you pinch between your thumb and fore-finger. One paddle produces dots and the other produces dashes. Pinching them at the same time produces a stream of alternating dits and dahs.

Figure 3 Iambic Paddle

The fourth method technically is not a key at all, but is still quite popular. That is a computer. There is a lot of software out there that will generate Morse code. All you have to do is type and the computer does all the work.

Comments or questions about keys? What is your favorite? What pros or cons have you discovered with the various types of keys?

I Only Have an HT

Okay. I know there are some of you out there that are looking at your radio, thinking, "I'd really like to give this CW thing a try, but all I have is an HT."

Acquire something that will generate Morse code. This might be a training key—a device like looks like a straight key, but has some electronics built in that generates audio tones through a speaker. It is a stand-alone device that does not require a radio or computer. However, it does not transmit anything; it just generates audio tones.

You could also use a computer application. I have an app on my iPhone called MorseButton that creates a tone when you touch the screen. Again, it only generates an audio tone, but I control the length of the tone by how long I hold my finger on the screen.

Once you have something that will generate an audio tone, all you have to do is hold your handheld near the speaker of the tone generator, press and hold the PTT button, and then use the tone generator to send the Morse code. Once you've sent your message, release the PTT button.

Are there any other suggestions for those with limited resources or equipment?

Conclusion

Are any of you involved in any CW nets?

CW is not required to receive an amateur radio license. It is not required for ERC membership or involvement in ARES exercises. It is, however, a distinctive element of the ham community with its own form of beauty and satisfaction. Morse code is a mode with a unique set of challenges and rewards; a mode that is as much an art as it is a skill.

This concludes tonight's training. This is N7TMS, back to net control.