The Modulator

Special—Morse Code Primer—Edition April 2018

Got Code?

Can I learn Morse Code?

The short answer is yes, you can. Morse Code has much in common with music. Music notation uses notes, note fractions, and dotted notes to describe the rhythm of a piece. Similarly Morse Code has standard timing. Dashes are three times longer than dots, the pause between dots and dashes is equal to one dot time, and three dot times separate characters. Consider these timings "behind the scenes" because your task is to associate the rhythm with the letter.

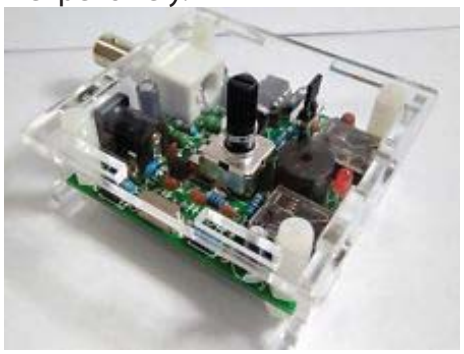
There appear to be three groups of code learners. The first and most rare group are those with the unique head wiring that allows them to soak up code rapidly and go on to be high speed ops with minimal effort. The rest of us mortals have to pay our dues by listening and practicing—see page 2.

This main group is further divided into those who will become 20 wpm or faster ops, probably the largest group, and those who will become competent operators, but who will copy at speeds below 20 wpm. Your editor is a proud member of this last group.

Most important for any code learner, regardless of their eventual ability, is to accept that code is about hearing the rhythm of each character at first, and then groups of character rhythms as words.

Is Morse in Your Future?

Let's be honest, learning Morse Code is not a one day task —see the sidebar—so why would you want to take it on? First, a code contact is uniquely ham radio—it's something we do. But beyond that, the circuitry can be so simple that perfectly serviceable transceivers can be built very small and inexpensively.



Last year's $10 Super Pixie, 2x2 in.

Add to that the unique ability of CW to cut through tough band conditions and you begin to see why Morse Code is alive and well on the bands. Last but not least, a code contact is just plain fun!

Growing Interest

Lately there have been signs of growing interest in Morse Code among our members. This Special Edition is offered as a guide to get you started.

First an explanation of the terms CW and Morse Code. Like most CW transmitters, the Super Pixie produces an unmodulated radio frequency electromagnetic wave when the key is pressed—Continuous Wave. CW refers to an operating *mode* like AM or SSB. International Morse is the *code* that is sent via CW. In practice, the two terms are usually heard interchangeably.

Deep Dark Holes to Avoid

The essence of Morse Code is rhythm patterns that you hear and reproduce. Fortunately for you broad consensus has evolved that recommends that the following be avoided as dead ends.

- Do not learn Morse from any page of dot-dash characters and their letter equivalents.
- Do not count elements (dots and dashes).
- Do not listen to slow code with standard timing.

The last point refers to code sent with the characters drawn out to maintain standard timing.

The goal is to recognize the rhythm and immediately associate that with its letter. All three bullets inevitably insert a thinking step in that process that will stop you from copying much over 8 wpm.

But how can I get started if I can't study a page, count, and listen to slow code?

How Best to Learn Morse Code

Before You start

You'll need a computer with software and a place to use it that is reasonably undisturbed. You'll probably find that using headphones is also a good touch.

Next you need to choose at least one time each day that you can devote 10 to 15 minutes for code practice. Consistent short sessions are best for making steady progress. If you can manage it, a morning and evening session is even better.

The Koch Method

Instead of trying to swallow the code in one big gulp, The Koch method starts you off listening to and writing or typing two characters. That's it, two characters. When you reach around 90% accurate copy, you add a new character or two. Practice to 90% and add again.

With each addition the number of characters in your practice session increases and it will take more time to exercise the whole set. If you find that there are some troublesome characters, you can run those in isolation to improve.

Farnsworth Timing

Now to the problem of getting started while avoiding slow code. As we have seen, in standard code timing, dot duration is the unit of timing in forming *elements* (dots and dashes), the time between elements, and the time between characters.

If we lengthen the time between characters, but keep the element timing unchanged, we can send fast characters at a slower word rate. This Farnsworth Timing is ideal for learning because you hear each character at its target speed, but have time to absorb that rhythm.

Starting at a word speed of 13 wpm, you will be discouraged from the natural tendency to count elements. Combine this with a character speed of 20 wpm using the Koch method and you'll be off and running. If you ask around, you'll find some range in these recommended speeds, but 13 wpm is about the lowest word speed that you should attempt.

Here is a suggested order of characters:

KMUR ESNA PTLW I . JZ XFOY

, VG5 /Q92 H38B ?47C 1D60

Prosigns

Code messaging developed in a commercial environment where speed was money, so it's not surprising that there are many short cuts. Sending AGN instead of AGAIN is common. You'll pick up these as you go along. *Prosigns* are special message structure characters. Here are four that you'll use regularly. Note the bar over the letters. That means that both letters are send together as a single character.

- $\overline{\text{BT}}$ Section break or pause.
- $\overline{\text{AR}}$ End of message.
- $\overline{\text{AS}}$ Stand by or wait.
- $\overline{\text{SK}}$ End of contact.

Good Code Sources

There are many good programs on the Internet that can be used to learn Morse Code. Any that meet these requirements should do the job.

- Separately adjustable word and character rates.
- Operator can choose what is sent.
- Copy accuracy evaluation.

Just Learn Morse Code

This is my favorite, by Sigurd Stenersen, LB3KB. It's free, but it only runs on PCs and you are requested to make a donation:

http://www.justlearnmorsecode.com/

Learn CW Online

LCWOL is an on-line source that can be used with any device that can connect to the internet and it's free. You have to cut and paste whatever you want to hear into the send box, so avoid reading the text beforehand.

https://lcwo.net/text2cw

---

www.arrl.org

The ARRL web site has a ton of practice and other aides for code learners. Type in morse code practice in the search box on the home page.

Most issues of the ARRL magazine, *QST*, include the weekday schedule for on-air broadcasts of code practice at different speeds.

Sending Morse Code

As you begin to learn the sound of good Morse Code, you'll naturally want to try your hand at sending it. Advice for learning code is easy because there is broad agreement about the good and bad things to do. Unfortunately there are two schools of thought about developing a *good fist*, the ability to send clear, easily readable code.

Sending Devices

The original device for shaping code characters was the iconic straight key. Depressing this simple lever activated the transmitter. Timing of elements and their spacing was entirely dependent on the ear and coordination of the operator.

The straight key was simple and reliable, but had two shortfalls: first, shaping each element, especially dots, causes forearm fatigue called *Glass Arm* by commercial operators. Second, sending speed tops out at around 35 wpm.

Classic Straight Key

Several alternatives were developed, but the paddle stands out today. A paddle is a horizontal blade that is moved right and left between thumb and forefinger. Pressed right closes the dot switch and electronic circuitry produces dots until the paddle is released. Pressing the paddle left produces dashes in the same manner. Because the duration of each element and the spacing of same elements are handled by electronics, the paddle is physically easier to operate.

Single Lever Paddle

There is two-bladed version, called a squeeze paddle, that allows both blades to be closed at the same time with a squeezing action. This produces alternating dots and dashes, the first element determined by the blade that was pressed first. Either paddle version is capable of high sending speeds with minimal physical effort.

Dual Lever Squeeze Paddle

Straight Key or Paddle?

Here's where the debate begins: There is no question that a paddle is physically easier to operate than a straight key, so why would anyone consider a straight key at all?

A straight key operator must control all timing, therefore all of those durations are heard with every element formed. If the operator has learned the code as rhythms, there is a continuous feedback loop between key presses and elements heard. Straight key advocates stress that this allows the new operator to perfect the ear-hand coordination necessary to send good quality code.

The Paddle advocate counters that beginners start with no ear-hand coordination and have to struggle right from the beginning. At minimum a paddle provide a start by timing the elements and the pause between same elements. Note that a paddle does not time the end of a character. If that timing is off, the character will lose or gain an element.

Is there a right answer? That's for you to judge. Beginners with either device are easy to spot. The straight key beginner will produce awkwardly timed code and the paddle beginner will add and drop elements, thereby sending wrong characters and having to make corrections.

But like any new skill, you start at the beginning and grow from there. The best learning investment you can make is to buy, build, or borrow a code practice oscillator and practice sending while listening to your fist. Alternate these practice sessions with your on-going code learning session so that you continue to build your sense of good Morse Code.