

## Introduction to Morse Code

by Chuck Adams, K7QO

Hopefully you have purchased the ARRL "Your Introduction to Morse Code" CD set (it contains two discs) for \$12. This is their Order Number 5811 ISBN 0-87259-581-1. It is indeedly a two CD set although not advertised as such. You'll probably find them discounted at swap-meets, but don't wait. Get them now. There will be some shipping charges. Run over to <http://www.arrl.org/> and look for ordering information if you haven't gotten yours and want to follow along. I am a member of the ARRL but I don't get anything for this recommendation. There are a number of reasons why I recommend the CD set. One: they don't wear out if you take proper care of them. Two: you can make a copy to tape to haul around in the car and another to put in your portable tape player if you prefer not to tote around a CDplayer. And three: the CDs are very well done both in style and in format. And the most important reason of all is that you can skip to any point on the CD to start where you left off with almost instant access. I will be using this method to point to where to go and work and I'll try to remember to point out the location for those that might have a tape version and skipped the CD. The \$12 is money well spent IMHO for the CD set.

I realize that I'll probably have all ages and all Morse speed levels of individuals watching this material and that is fine. I am having to develop

this stuff over a period of time, so don't ask me to speed things up 'cuz I am not where you are. Be patient. Turn on a receiver and listen to W1AW (see <http://www.arrl.org> for the schedules) for the higher speed stuff until we get to 40wpm or so. I have to do this from the ground up. The purpose to get everyone to enjoy my favorite mode of operation on the ham bands or to at least get to the 20wpm level.

First let me pass on some philosophical points of interest. Morse Code is a language. Any language is learned by some memorization and then by using it a lot. Go back to the early days of your life and schooling. We all memorized the alphabet before we could read. You have to learn and memorize the alphabet for the Morse code language, so don't skimp on this part. It is very critical to what will happen to you for the rest of your life in using Morse. The reason some people hit a plateau on their code speed, a.k.a. a barrier, is most likely due to learning the code incorrectly.

Morse is a language of sounds. So throw away all the charts with dots and dashes and in fact you shouldn't look at any printed material of any kind until after you have memorized all the code characters. Forget all the charts that you have seen on the internet on web pages showing the Morse characters as a series of dots and dashes. I can guarantee you that you will ruin your upper limit on the code speed until you can completely erase the damage done. One of the nice things

about the ARRL course and others is that you start out listening and you don't need a book in front of you.

Now I am attempting to teach a number of people, and I truly hope the number is large but I'll never know, via a medium that separates us by miles and to all parts of the world. So I can't stand up in front of you and lecture like I do as an instructor. So this task is difficult at best, but doable or I would not be making the attempt. I can't do the work. You have to. So first clear your mind of any evil thoughts and think positive. You can do this. Many have and many more will. Be proud and go forth. Set a goal of 30wpm. Remember what Alexander Pope said. "Not failure but low aim is crime."

Now a couple of more points and I'll get off the soapbox, so to speak. I am a speed reader and can do over 2,000 wpm. Some of the same tricks apply to Morse, so let me pass on some helpful hints in a list format and maybe I can come back and give you all the gory details, but let me let you think about the physical and psychological implications first. It's not hard.

- Don't playback the sounds in your mind when you are copying. In speed reading we call this vocalizing. Readers who sound out the words slow themselves down.
- The single most important thing in Morse is: if you miss a character, immediately forget all about it. More are coming, and faster than you want, and you don't have time to try to go back

and try to remember and you'd be wrong most of the time anyway. It is better to drop one than to miss several more in the process. Fill in the blanks later.

- Select a quiet, comfortable environment in which to learn. Do it before everyone else gets up or after everyone else goes to bed if you are surrounded by rug-rats or others. Remove all distractions. I find that my mind is more alert early in the morning and faster than late at night although I still consider myself a night-owl.
- Set aside 30 minutes a day if possible, everyday. Don't skip. This is not like exercising where you have to take a day off and let the muscles rest. The mind never takes any time off except for sleep.
- Don't regress as you copy, i.e. look back and try to figure out what you have copied. We'll do that later after you get more proficient. You will be so proud when you get to that point. Some call it copying in the head. You'll see what it is all about.
- Start out with only the CDplayer, ballpoint pen, and paper. Write. Do not print. If you think your penmanship is lousy then you get a chance to do two things at once, don't you? I have individuals insist that they can print faster than they can write. I have a problem with that as a physicist. QED. Write so that you can read it and you aren't going to be going that fast at first anyway. I personally write with a fountain pen so I don't like a ballpoint personally, but will

use one for copying Morse. Rolling writers are better. I also recommend that you use rather smooth paper later on for high speeds, but it is not critical now. The reason I recommend a ballpoint is that a pencil 'drags' and the point will break or wear down when you don't want it to. Murphey's Law at work. And don't press down hard. You aren't carving this stuff into stone.

- Don't write across the entire page. Use only half the page at one time. When you get to the bottom of the page while writing a during a session, then turn the page 180 degrees and go down the other half. Draw a line down the center before you begin, if you want. By using both sides in this manner you are saving trees. Use both sides of the page and then turn it over to the other side and use it also. In fact, use the cover pages that laser printers spit out at work. Use any scraps of paper. You're going to recycle it eventually. People will ask and you are one of them, why use only half the page at a time? Well, the time it takes to move the hand across the page is important. Going only half the distance will take about half the time to come back to the beginning of the next line and this could mean a character or more at 10wpm or faster.

- Consider the thirty minutes of daily practice learning the Morse Language and increasing your speed as what I call "quality time". It is something that you are doing for yourself and noone else. It is yours and noone can take it away from

you. Try to do this when you are fresh and not tired. If you do get tired, then come back later when you are rested. You make little or no progress when your mind and body are tired. You can do better and progress faster when refreshed.

- We'll work on the sending later. That is going to be a tough one and we'll get to it as soon as I figure out a cheap and dirty way to do it. You are going to have to spend some more money on this one I am afraid. But I've always said that education is expensive no matter how you get it.

- Try not to count or visualize the sounds that you hear. Just take them as they come and memorize them. Review the letters daily. You might spend the rest of the day or until the next 30 minute period translating road signs and billboards into Morse as you pass by. Concentrate on the driving though.

- Listen to the code at a low volume level. Do not 'crank up the volume'. Your ears are precious and you are issued only one set per person. Protect them at all costs. I listen to Morse only on headphones and at a quiet volume. There are several reasons for this. Go back and read the instructions on your Sony Walkman or whatever. They say to use low volumes. Their lawyers tell them to do that. High volumes can cause hearing damage. Also there is a more important physical reason. High volumes for Morse characters cause 'ringing effects'. You put the eardrum into motion via the sound and after the sound has

gone the eardrum will move a couple of more oscillations before it stops. This keeps the sound going, thus the 'ringing', and limits the upper speed at which you will be able to copy when you speed up. Remember this children. :-) Using speaker(s) for listening causes sounds to be reflected from distant points and add to or cancel the original sounds. Not critical at slow speeds but we aren't going to go slow all our lives, are we? If you happen to be in a room that is relatively large and the walls and ceilings are barren of pictures, drapes, and other sound absorbing materials you will be able to hear sound reflections and echos when using the speakers. This is important and will cause difficulty and errors at higher speeds.

- Don't try to rush your learning process. Take it slow and easy. You don't want to burn out or get frustrated. Don't go on to the next lesson until you have mastered the previous ones, i.e. thoroughly memorized each character. Yes, you can make mistakes. If you don't make mistakes you aren't doing anything is my motto.

- Oh, and don't ask and don't think about the computer learning process yet. I am not opposed to that technique, but it requires some other things and may teach you some bad habits. You need to walk before you run. You are taking this technology bit too far IMHO. To me it distracts and you have a tendency to want to do something else at the same time and will lose your concentration.

OK, hopefully at this point I have inspired you and not depressed you. This is going to be fun.

Some will ask why ARRL? It is the only set of CDs that I know of. I have bought all the rest of the code courses that I know about and will do a review of them later. I'm working through them as we speak. I'll just be using the order in which the characters are introduced in the ARRL CDs. Some will try to get through this material without spending any money. Shame on you. You'll pay later and I hope your time is more important than skimping on a lousy \$12.

OK, let's get started. I'll add audio snippets later. I thought that on July 1, 1997 I would have the technical expertise and tools in place but I ran into a snag. I can generate digitally perfect code at a rate of 44.1KB per second, just like CD quality audio, but you don't want to download a few minutes of audio at that rate. It'll eat your disk space alive in the process, not to mention the friends we'd make across the Internet. :-) So I'm working on a conversion process to get to a sample rate of 8K for .aiff files. Film at 11 as they say on the east coast network stations.

### **DAY 1**

Work through the CD tracks 1, 2, 3, 4, 5, 6, and 7. This totals only 9 minutes of time. The letters A, E, R, N, and T plus the End of Message prosign, which I will show as  $\text{¡AR}_{\text{L}}$ .

I personally recommend you replay this two more

times in the 30 minute period. Writing down each character as it is played. This is training you to respond as rapidly as possible to the sounds. I realize that many have not been a student in a long time, but it is the same process. Concentration and work. Long time since you were a student wasn't it? For the kids you are masters at this stuff. It's child's play. The adults don't have a chance. They've forgotten everything they ever learned. :-)

OK, class dismissed. Study your homework and there will be a quiz later.

## DAY 2

Work through the CD tracks 8, 9, 10, 11, and 12. This adds another 9 minutes of audio time and the letters I, O, S, D, and H to your repertoire of the Morse alphabet or the alphabet in a new form if you will. We are almost half-way through the letters so this isn't going to be too difficult. Think about all those people who were saying that you couldn't learn Morse because they couldn't or thought that you shouldn't. You have showed them a thing or two haven't you? If you run through the tracks 8-12 two more times then you should be further along in memorizing the letters. If you are not too tired and have the time, then play all the tracks 1-12. Make sure you concentrate and you write down each letter as you hear them. Let me see if I can give you some idea of what we are trying to accomplish with this exercise. If I were standing in front of

you with a newspaper and I were to start on a sentence by saying a letter at a time. Would you have to do much serious thinking to write each one down? I think not. Now how is it that you can do that? Well, if we were to go back through your life we would probably find that you have spent hundreds if not thousands of hours doing just that in school. Now, we don't want to have to do this here, i.e. spend that much time, but you will get to the point where you can do it without thinking. That is what we are striving for here. It just takes time. Now for some more Chuck's Helpful Hints. • Don't try to visualize the sounds. Just enjoy them like you do music.

- Don't count the elements that make up the individual letters or try to compare letters. I hate it when on a tape or CD the individual doing the narration says that so and so character has N elements. Don't even think about it. Write them a note to have them change it. It's a conspiracy... :-)

- Don't make a cheatsheet and try to memorize the letters from it. I know that this adds a level of visual to audio translation that you do not want to get into.

OK, class dismissed. Thanks for your valuable time. See you tomorrow, same Bat time same Bat channel.

**DAY 3**

For the third day, work through CD tracks 13, 14, 15, and 16. This will give you another approximately 8 minutes to work through and you'll add the letters C, U, Y, and the period to the growing list of Morse Characters that you will know. Run through this group three times total and make sure you have the new characters memorized. Make sure that you are writing each letter as it is sounded on the CD. This is important. It is building an automatic response to the sequence of sounds. Later on you will be doing this without thinking, which is exactly what you want to do. It's just like talking and listening in daily conversations. You don't often have to stop and think about it unless you forget a word or are learning a new language. One of the nice things about the Morse Code language is that you only learn the characters. You don't have to learn the words, you already know those. Rosalie White, WA1STO, wa1sto@arrl.org, does an excellent job with the voice part of the CD. I know that I personally would not subject any human being to the sound of my voice recorded on a tape with that wide a distribution. :-)

I think you each should personally send her email thanking her for the excellent job and letting the ARRL know that you are using their training material. Just as a favor to me. Ed Hare, W1RFI, w1rfi@arrl.org, did the equipment that produced the shaped waveform with 5mS rise and fall times, thus eliminating the 'thump' that very rapid rise and fall times would produce. If

your headphones sound like they are producing a thump or clicking like sound at the make/break of each code element, then try reducing the volume a little more or experiment if you have other earphones. It is annoying if it happens but more importantly it is tiring and makes the task unpleasant to listen to the code. I knew that when I took on this task I would be writing a book. In fact, in short order I will be breaking the course into additional links, so that you don't have to download all this stuff over and over. This work will turn into an instruction guide to add more to what the CD and it's booklet give you. I hope this is worth your time for me to do this. I assure you I am spending more time than you are, but I believe it to be time well spent. I am also listening to the CD each day making sure that I'm not giving you too much to do. Stay with me. If you feel that my speed is too fast, then by all means slow down and take fewer tracks per day, but do spend the 30 minutes per day. Break it up into 15 minute periods if you want. But by all means don't lay off for any period of time. Two things will occur. You will rapidly regress and you will lose some of your momentum and motivation. Hang in there. The rewards are many. Also feel free to send me email on any problems you are having or questions. I am using them to create a Q&A page and will start it up online pretty soon. This for things that I'll either get to later or that are outside the flow of this course. OK, another day another dollar as they say. If you have come this far, then you are past the point

of no return. You can't quit now. Don't quit. The crowd is cheering you from the sidelines. It matters not whether you come in first or last. You have to cross the finish line. You can do it.

#### DAY 4

For the fourth day, let's let you rest just a little and not have to memorize any new characters. Let's try the following. Turn off the audio channel with the coaching from Rosalie White. Start at track 2 and go until track 16, the last one you covered yesterday. This will be about 20 minutes total. Listen to it straight through if you can, writing each character as you go. Concentrate and remember to skip any character or group of characters that get by you and get ready for the next one. Maybe draw an underline for each character that you miss one as a place holder and a reminder that you missed one and should go back and review it until you get it perfect.

Now look at the booklet that came with the CD and grade yourself. The total number of characters is about 585. Count the number that you missed and subtract from 585. Using a calculator divide by 585 and then multiply by 100. This is the percentage that you got right. Hopefully you got 100 percent correct. If your number is less than 80 percent, then you need to rest for a few hours and then come back and listen to the tracks that you missed the major portion of with Rosalie White's voice track included. Then take the quiz again. Did you do better? Of course

you did. And don't worry if I missed the count by a few critters. The math is close enough and I hope that I erred on the high side for you. Keep a log of your progress and write down your score. Measure your progress daily and record it in a notebook and make notes. Keep track of how you are progressing and do not become discouraged if there is a setback or two along the way. It is normal in the learning process.

Do not go further until you can do better than 90 percent. No need in adding more clutter that will confuse you. Don't worry, you are not the only one that will get stuck here for a day or two. It doesn't matter and you don't have to burn yourself out. In all my years of teaching I have found that the things that you remember the most are the things that came the most difficult way. I like a song that Joan Baez did that started with the phrase "Be not too hard for life is short and nothing is given to man".

So hopefully at this point we all have a firm foundation of a bunch of Morse characters. You all did great and I'll be back tomorrow and we'll start on some new characters and some new hints. See you tomorrow.

#### DAY 5

OK, now we are ready to continue on down the trail and learn some more new sound groups that make up additional letters. Now play through tracks 17, 18, 19, 20, and 36. This will give us

the letters L, M, P, G, and the number 1. As usual do this three times and each time write down the letters as you hear them.

OK, now I did something different here. I threw in a number. Another reason why I wanted you to get the CD so that we could skip. I believe that the reason why a large number of CW operators have problems with numbers is that we save them until the last in most courses. I want to do this differently. Do not try any number other than 1 at the present time. And I know this is very very difficult, but don't try to count the number of elements. Just get the rhythm of the character. Listen to it and just feel the flow. Numbers take longer to send than letters and your mind will have just a little bit more time to adjust. Numbers are neat. Enjoy them. If you start counting you will be in big trouble later. That I can promise you.

If you don't feel too tired after doing this and you are using the CDplayer, how about taking tracks 2-20 and 36 and randomly picking them and playing them back? This gives you some random practice. The more you listen the better off you will be. Some modern CD players have a programming function and/or a random play feature that you may take advantage of to have the player "jump" around between the tracks to help keep you from memorizing the tracks sooner. You will memorize them and don't worry about it. A large number of individuals will say this is bad but it does help. I don't know if in

high school and college instructors still have people memorize poetry. I have a number of poems and documents that I had to memorize when I was younger and I still remember them. It does help. And at one time you had to memorize how to spell every word that you know. Some people have given up that idea. :-) Gives the spell checkers on the internet something to do with all that valuable time that they want to waste chasing the rest of us into frustration with them. :-)

I don't know how well you can do this, so just try it and then let me know if it works. On your way to and from work (while paying attention to your driving if you are driving) look at signs and see how many of the letters you remember and can play back in your mind. If you don't feel uncomfortable doing this or are getting the letters mixed up, then don't do it. It sometimes helps as a memory aid.

### **DAY 6**

Today let's try tracks 21, 22, 23, 24, 25, and 39 to give us the letter F, and the comma which sounds musical, W, B, and 4. Again, you should work at least three times on these tracks and write them all down as you go. Track 23 is a cheerleader track and your own personal pep-rally.

You are almost all the way through the letters. I'm sure that you feel like there are a lot of them, but there are still only 26 letters in the English alphabet. You are just hearing them in a differ-



ent form. You will get used to it in time and time is the important word of the day and everyday. Practice and take the time and you will do well.

I am hoping that 30 minutes isn't too much time to ask. Break it up into two parts in the same day if it is too much of a problem to do it all at once. Or take a five minute break in the middle and then continue. You are the one doing it and no one is standing over you and forcing you to do this that I know of.

OK, please take a moment and send me email. How is it going? Do you feel the pace is right for what we are trying to do? Want me to slow down, i.e. take on fewer characters per day? There is a tendency I am sure to feel like that you shouldn't be like a 3-year old trying to learn the alphabet at this point in your life, but it does take time. The time and effort spent here will pay off later. Just be patient with yourself and the process.

### DAY 7

Today let's try tracks 26, 27, 28, 29, and 44 to give us the double dash, J, the slash, K, and the number 8.

The double dash also written as = or jBT; (the latter because I can't do a line over the two characters is used a lot by CW operators that are getting their thoughts together or killing time. This is an old habit of not allowing 'dead air' time and having someone grab the frequency away from

them. It also showed people the frequency was in use. Not really a good habit, but it is still practiced. I'll come back to that much later in a discussion of on the air practice.

Remember to spend 30 minutes doing this and go over each track as many times as you need to be sure you have the letter, prosign, or number memorized pretty good that we have covered up to this point. You can forget 'em before you know it, so don't let up. You can do it.

### DAY 8

Today is the magic day. You finish all the letters. Now do tracks 30, 31, 32, 33, and 46. So you now have all the letters and the numbers 1, 4, 8, and 0 and some prosigns. You may not be quite all that comfortable with all the letters, but practice will get you there.

### DAY 9

Today tracks 34, 35, 40, and 45. For the numbers make sure that you are not counting. You can tell when you hear them that they are longer than regular characters and there is the tendency to count. If you start doing this you will kill your speed later on. Just relax and listen and memorize the sounds. Do this for 30 minutes on these tracks alone.

**DAY 10**

OK, Day 10, add tracks 37 and 38. I am hoping that whatever CDplayer you have has a 'random' or 'shuffle' mode. This means that the player will pick a track at random of all those on the disk and play it and then skip to another track somewhere else on the disc. This is to keep you from getting bored with a CD and have all the songs memorized. We all probably have several audio CDs that we play more frequently than any of the others and you know ahead of time what the next song is going to be before the first note is played. The random play mode is for the purpose of keeping you entertained and keeping your mind from getting lazy. Well, guess what? It works as well here. Just another reason why I like the CD version of the Morse Code course. Now start doing that to this CD everyday during your practice session after learning the tracks listed.

**DAY 11**

Now work on tracks 37, 38, and 41. Now 41 will take some getting used to, I'm sure. But you can do it. Replay it a bunch. Be sure to add on some random plays of the rest of the disc that you know at the end of the session. By now you should have a regular schedule going and you have gotten used to sitting for half an hour and doing this. Make sure you don't wear yourself out doing this. Take breaks if necessary.

**DAY 12**

For day 12 add tracks 42, 43, and 47. Congratulations!!! You have finished all the tracks on the first CD.

**DAY 13**

For day 13 just do only random plays on the CD. Try it without the coaching of Rosalie White. Challenging isn't it? Whenever you get to a trouble area, play it with Rosalie's (note how I'm on first name basis with people :-)) voice channel on several times to stimulate the memory into remembering the letter or character. Makeup a test by doing several channels without the voice and then grade yourself with the booklet.

**DAYS 14-21**

Spend as much time as possible the next few days going over all the tracks in random play mode without the voice track and copy all the Morse characters. Afterwards check against the booklet to see what percentage you are getting correctly. You are either right or you are wrong for each character. Sorry, no partial credit given. :-)) Grade yourself and record it in your notebook or record of your progress.

**DAY 22**

Now we are ready to start on CD 2 in the ARRL Introduction to Morse set. At this time you will start copying words. I realize that you want to copy everything in the world, but you have to spend some time reinforcing the memory and reduce the response time upon hearing a complete sequence that makes up each character. Spend thirty minutes or more on tracks 1, 2, and 3 of the second CD. Take one break during this time period if you need it and the time off does not count. :-) You'll find that after you get your license you will think nothing of sitting for more than two hours without getting up from your chair. Physical endurance is important and necessary for lengthy time periods. Check your copy (the words that you copy) with the booklet that came with the CDs. Do let me warn you of one thing. Do not get in the habit of attempting to predict what next character is or what the whole word is. If you start doing this, then you are going too slow or have the session memorized. At the lower speeds under 25 or 30 wpm it is easily a bad habit to get into. Try to avoid it. It is a bad habit and will put a limit on your speed until you are able to overcome the practice.

**DAY 23**

Now go to tracks 4, 5, and 6. Do another 30 minute period. Repeat tracks that are giving you trouble. If there is a particular letter, then go back to the first CD and play that track for

five minutes in repeat mode until you have it down well. Concentrate. You can do this.

**DAY 24**

Now go to tracks 7, 8, and 9. Do another 30 minute period. Repeat tracks that are giving you trouble. Concentrate. You can do this.

**DAY 25**

Now go to tracks 10, 11, and 12. Do another 30 minute period. Repeat tracks that are giving you trouble. Concentrate. You can do this.

**DAY 26**

Now go to tracks 13, 14, and 15. Do another 30 minute period. Repeat tracks that are giving you trouble. Concentrate. You can do this.

**DAY 27**

Now go to track 16 and any others previously that were giving you particular problems. Do another 30 minute period.