

# **Learn CW using the Koch Method**

Oakville Amateur Radio Club, Oct. 2014

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# Overview

- Why CW?
- Ludwig Koch's research
- Koch method software
- Other tips for learning to copy CW
- Learning to send CW
- Next steps (after you learn CW characters)

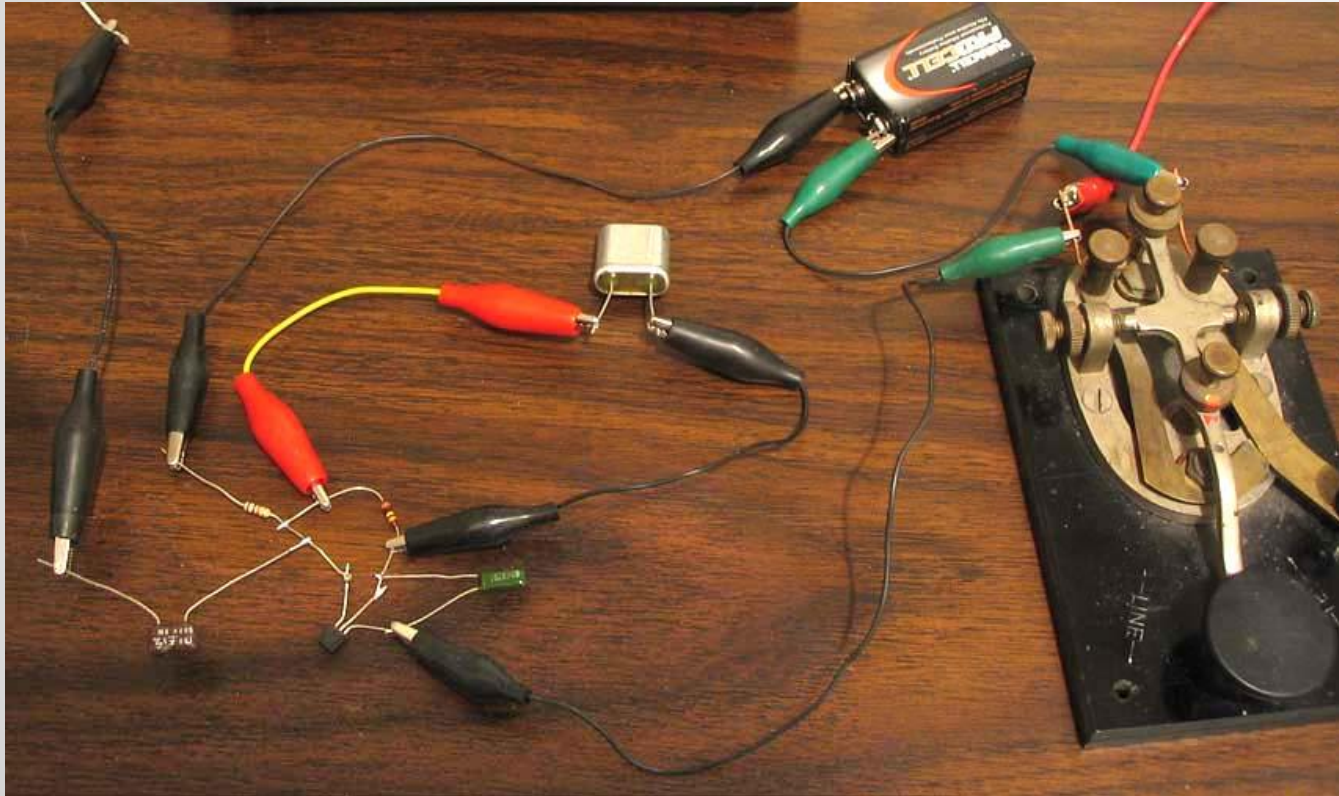
# Why CW?

- ~~Narrow bandwidth~~
- ~~100 W CW is like 1 kW SSB~~
- ~~Reliable in poor band condx~~
- ~~Universal language (Q-codes, abbreviations)~~
- ~~Quicker to DXCC~~
- ~~Contests - higher QSO rate, more pts/QSO~~
- **It's fun**
  - It's rewarding to develop CW skills and use them on the air

# Why CW?

- Requires only simple equipment - cheap and easy to build
- Extreme example - “Easy Ten” transmitter - 6 parts plus 9V battery, straight key and random wire antenna
  - one 2N3904 transistor
  - one 80M crystal
  - two capacitors
  - two resistors

# Easy Ten Transmitter - K7NS



# Why CW?

- Very portable
  - PFR-3A transceiver w/ int. battery, keyer, tuner
    - Rx current consumption = 34 to 47 mA
    - Tx current consumption = 650 to 750 mA
  - Antenna
  - Mini paddles
  - Earbuds
- No decoder required, other than the one between your ears

# Portable CW Station - WB9DLC



# Ludwig Koch

- German psychologist
- Objective - find the most efficient method for teaching prospective radio-telegraphy operators to:
  - send 100 words in five minutes,
  - copy a 100 word telegram in five minutes, and
  - copy 125 words of ordinary text in five minutes, one word = five letters.



# Koch's Research Findings

- 1936 research report
- Findings:
  - Auditory learning at all times - no visual aids
  - Learn at 12+ wpm
  - Normal spacing between characters and groups
  - Start with 2 letters
  - Send random 5-letter groups
  - Add a letter when reach 90% copy
  - Character order matters

# Auditory Learning at All Times

- Train your brain to process sounds reflexively, not analytically
- Visual aids and mnemonics add processing time

sound+visual/mnemonic method = analysis (bad)

sound → visual → character

sound only method = reflex (good)

sound → character

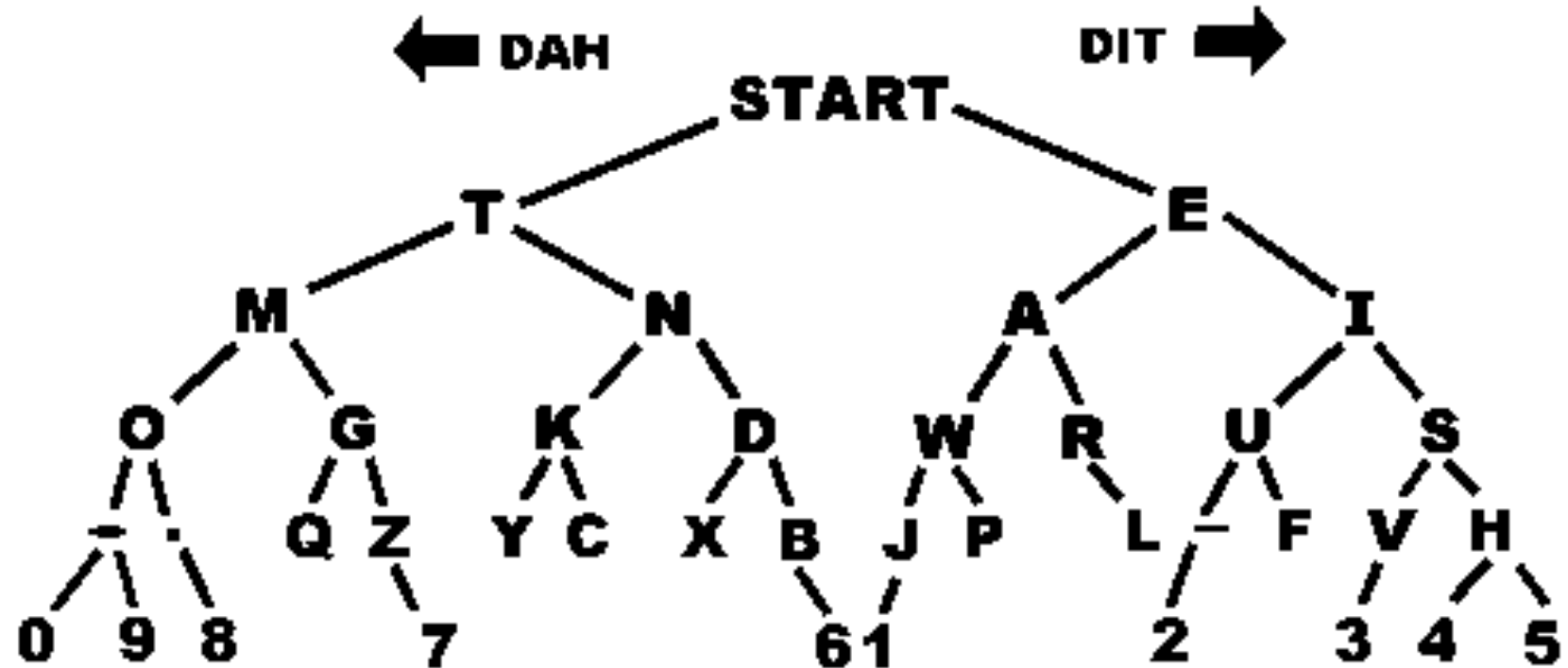
# Don't use this!

[www.learnmorsecode.com](http://www.learnmorsecode.com)

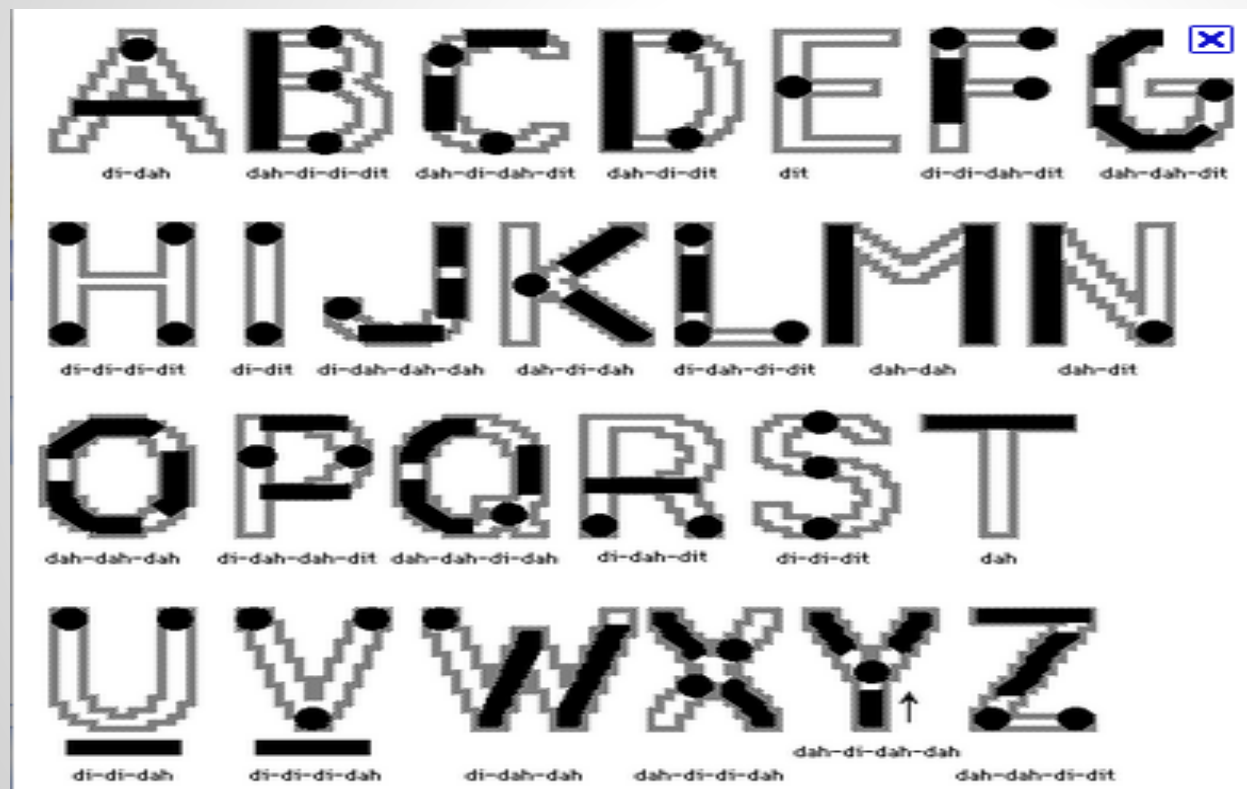
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# Don't use this!

[www.learnmorsecode.com](http://www.learnmorsecode.com)



# Don't use this!



# Learn at 13+ WPM

- Slow code (5 wpm) - counting dots and dashes
  - May hit a plateau at ~ 10 wpm
- “Fast” code (13+ wpm) - hear a sound pattern (rhythm recognition)
  - You begin to recognize the sound pattern of a particular character
  - No time for counting

# Learn at 13+ WPM

- Koch found that 12 wpm allowed individuals to increase speed without hitting a wall
- Many proponents suggest learning at 18-20 wpm rather than 12 wpm
  - For example, some suggest character speed of 18 wpm with an effective speed of 13 wpm (combination of Koch method and Farnsworth spacing)

# Character Order and Progression

- Koch's research suggested beginning with letters that are distinctly and obviously different
- Gradually learn to discriminate between smaller differences
- There is a Koch character order for learning CW (software follows this order)



# Length of Practice Sessions

- 30-minute sessions worked best for Koch's students
- 45+ minute sessions led to diminishing returns
- Even 15 minutes per day is OK
- Practice every day

# Koch Method - Summary

- Computer sends you two morse code characters - k and m - at 13+ wpm
- Random five letter groups (or random length groups)
- Three-minute sessions, 15-30 minutes total/day
- Copy on paper or keyboard
- Compare your copy with what computer sent
- If percentage of correct copy > 90%, add a third character (follow Koch character order)
- Continue for all 26 letters, ten numbers and punctuation

# LCWO

[www.lcwo.net](http://www.lcwo.net) - Fabian Kurz DJ1YFK

- Online
- Customizable - character speed, tone, length
- Keeps track of your progress
- Bonus stuff - callsigns, plain text, mp3s

# Other Koch Method Software

PC: <http://www.g4fon.net/>

[www.justlearnmorsecode.com](http://www.justlearnmorsecode.com)

Apple: Koch Trainer by Pignology, LLC

Ham Morse by AA9PW

Linux: <https://code.google.com/p/kochmorse/>

Android: IZ2UUF Morse Koch CW

BB: Morse Coach by Binarywright Systems

# Listen to Good Code

- Listen only to accurately sent code while you are learning the CW characters
  - Computer-generated code is best during this phase
  - Avoid listening to sloppy on-air QSOs
  - W1AW on-air practice sessions (13+ wpm only) are good once you are familiar with most characters

# Head-copy vs. Writing/Typing

- Subject to debate
- My training involves mostly trying to copy in my head, but only because I practice on the train with a smartphone and earbuds
- My typing skills aren't great
- Typing skills come in handy for CW contesting

# Farnsworth Method

- Characters are sent at regular speed, but extra spacing is added between characters & words to slow the overall transmission
- E.g., 18 wpm character speed and 13 wpm effective speed
- Idea is to allow you to learn the sound pattern (not count the dits and dahs)
- Critique - not learning proper spacing/timing, which you should know when you start to send

# Copy “Good CW” before Sending

- One view - practice copying code for a while before your start to practice sending
- Ingrain the sound of perfectly-formed morse characters (i.e., computer-generated code) in your brain
  - Helps you develop good timing for sending



# Learning to Send CW

- Rule #1: accuracy over speed
  - Better to be slow & understood than fast & sloppy
  - Proper spacing, character length
  - Speed will improve over time
- US Navy training series - straight key adjustment & technique

<https://www.youtube.com/watch?v=nVkJr0GyJPI>

<https://www.youtube.com/watch?v=ncOcgArGJHI> - another good straight key tutorial

# Learning to Send CW

- Buy or build a code practice oscillator
  - Send from a newspaper or book
- CW Decoder v. 3.00 by WD6CNF

<http://www.amqrp.org/projects/cwdecod/decoder.htm>

- Good way to check accuracy and spacing during sending practice
- Run an audio cable between rig's speaker output and PC's microphone jack

# After you learn the CW characters...

Increase your speed and ability

Contesting: Morserunner, RufzXP, QRQ,  
IZ2UUF's app, lcwo.net

QSOs: on-air QSOs, IZ2UUF's app

Books: ebook2cw, ebook2cwgui

News: <http://aa9pw.com/morsecode/>

# Summary

- Koch method

- Audio only
- 13+ wpm
- Start with two characters
- Add a character when you reach 90% copy
- Character order matters
- 15-30 minutes per day, every day

#1 ingredient for learning CW = persistence

# Links

So You Want to Learn Morse Code by N1IRZ

<http://www.qsl.net/n1irz/finley.morse.html>

Koch's research

[http://www.9h1mrl.org/ukrae/arc\\_cd/extra/morse/html/c29.htm](http://www.9h1mrl.org/ukrae/arc_cd/extra/morse/html/c29.htm)

Your Novice Accent and What To Do About it (good operating habits)

<http://www.atcweb.com/tsn/Accent.pdf>

Clubs:

FISTS - <http://fistsna.org/>

SKCC - <http://www.skccgroup.com/>

NAQCC - <http://www.naqcc.info/>