



CWA Advanced Class Notes

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Session 0

CW Academy

- Meet and Greet
- Introduce ourselves
- Test Jitsi and Sidetone audio
 - No time limit on Jitsi “free” account
 - No special audio settings
 - Jitsi seems to prioritize audio over video when allocating bandwidth
- Do the first three h/w assignments before the first class on Monday



Overview

- 8-weeks (M & Th 6-7PM on the West Coast, 0200-0300 UTC Tu & Fri in EU)
 - MST follows immediately after on Mondays
 - **Please use headphones!!!**
- Daily Practice
 - Two or three 15-minute sessions per day is much more effective than one 4-hour block once per week
 - Homework: Short stories, QSOs and CWT exchanges
 - Practice sending also!
 - RufzXP and MorseRunner
 - There is a “community edition” of Morse Runner that includes several different contest formats
 - DO NOT use any special lists of call signs!
 - Evaluate your sending (e.g. Iambic Master, recording ...)
 - **GET ON THE AIR!!!**
 - SST, MST and CWT are great contest practice
 - Ragchews
 - In-class exercises will reinforce skills but are no substitute for practice and OTA time
- We will supplement each class with related topics to help improve your operating skills and overall enjoyment of our great hobby



Coarse Course Overview

CW Academy

- Sending
- Practice Mini-tests: SST, MST CWT
- Hit-and-Run and Short QSOs
- Rag-chewing
- Logging
- Chasing DX
- Cut Numbers
- Sending
- DX Cluster and RBN
- More Contesting
- CW Ops
- ???



Philosophy

CW Academy

- Its a hobby, not a competition!
 - Keep it fun!!!
- Just like on the air (OTA), there are different skill levels coming into this class
 - Compare yourself **only to yourself**, not your classmates
 - Don't get frustrated or worry about slowing down your classmates
 - All of us, even the CW “speed demons,” have been where you are now
 - More skilled ops, PSE QRS! GET THE MESSAGE THROUGH!!!
- Challenge yourself
 - Listen to homework a little faster than you are comfortable with
 - Strive to make a few more QSOs in the CWTs
 - Try “running” in the SSTs and MSTs
 - Practice sending a little faster ...
- Practice, get OTA and HAVE FUN!!!
- In-class activities will focus on contesting at first and gradually build up to longer QSOs



About AA2IL

CW Academy

- Grew up in Upstate New York
 - Job Transfer brought me to San Diego in 1993
 - Current QTH is in a rural area in the foothills North East of SD
- First licensed in the late 1970s as a teenager
 - Went silent for over 20-years
- Retired in Oct. 2021 after 35-years as an Electrical Engineer (signal processing)
- Radio activities include
 - Chasing DX and contesting
 - VHF/UHF and satellites
 - Antennas, Linux software development and micro-controllers
- Modest HF station
 - Main rig is an FTdx3000, no amplifier
 - 100W and wire antennas
- I took this class in spring 2002
 - Biggest take-away was how crucial daily practice is to improving speed

Go Brass Flounders!





GitHub Repository

- I have set up a repository on GitHub for items related to CW and this class:
 - <https://github.com/aa2il/CWA>
- There have been complaints about the “new” CWA practice files. The “old” versions of these files are available there. Use these instead if you prefer:
 - “OLD Advanced QSOs”
 - “OLD Advanced Short Stories”
- The sub-folder “N1MM” contains a collection of “quick-start” guides for N1MM logger
 - N1MM is the most popular contest logging program but certainly not the only one available
- The file “Panagrams.pdf” contains a long list of panagrams you can use for sending practice.
 - Panagrams are helpful in that they hit each letter of the alphabet at least once
- Poke around and feel free to suggest other material to include there
- Get an audio player that allows you to change the replay speed (e.g. audacity)



Week 1 - Session 1

CW Academy

- Go over Homework and On-The-Air (OTA) activities
- The NAQP CW contest is on Saturday
 - Exchange is NAME and STATE (same as SST)
 - One of my favorites because power is limited to 100W and lasts only 12-hours
- DX - If you have any ambitions of “working them all:”
 - Clipperton Island (TX5S) should be QRV soon
- Get on the air!
 - There’s always rags to chew, POTA/SOTA/SES stations ...
- Sending
- Word game drill
 - Animals
 - Colors

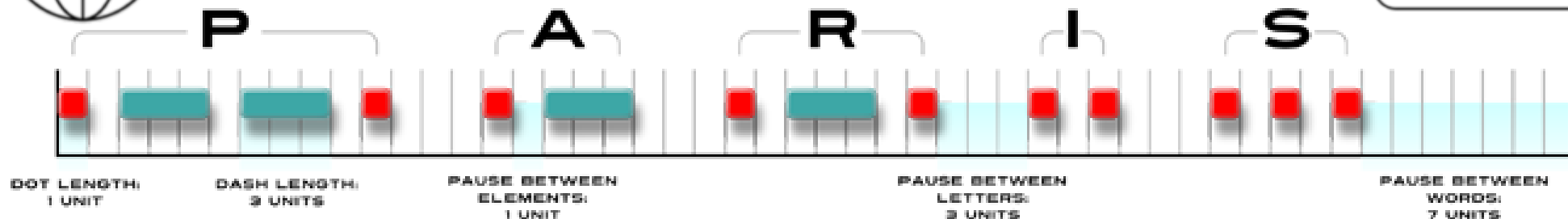


CW Sending

- Sending clean and crisp code is as important as copying
 - Your “fist” is your signature on the air
- General rule of thumb is to never send faster than you can comfortably copy
 - Will depend on conditions and context
- But, as you head copy skills improve, you will likely outpace your “clean” sending speed
- Most CONTEST ops are using a computer for sending
 - You are encouraged to do this, especially in fast-paced events like the CWTs
- However, a well-rounded CW operator must have a decent “fist” so you need to devote time to practicing sending
- **For class sessions, keep your speed under 18-20 WPM!!!**



PROPERLY SPACED MORSE CODE TIMING



"PARIS" [at 50 units in length] is used to represent 1 word which can then be divided into a minute to get the WPM rate.

- T = Duration of a dit (seconds)
- "Paris" is the "standard" word length = 50 dits
- $\text{WPM} = \text{No. Times we can send this standard word in a minute} = 60 \text{ sec.} / (50 T)$
- **$T = 1.2/\text{WPM}$ seconds**
- e.g. For 25 WPM, each dit is $1.2/25 = 0.048 \text{ s} = 48 \text{ ms}$



Sending Practice Ideas

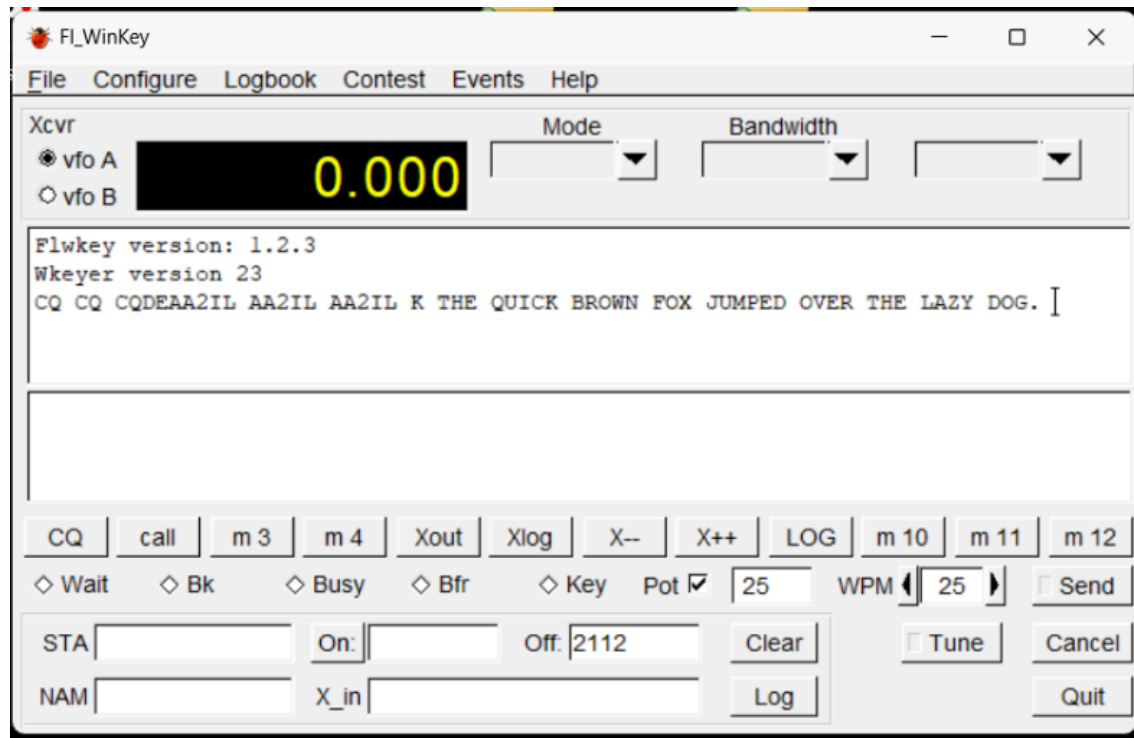
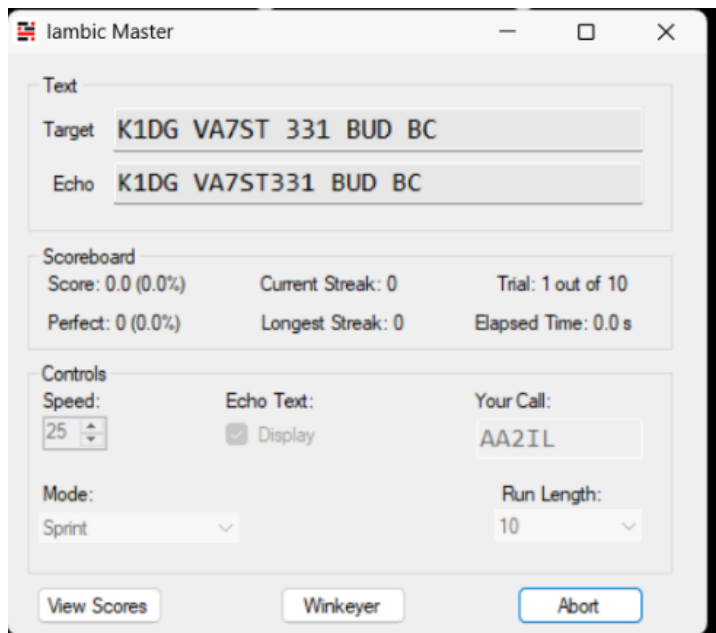
- Devote at least 5-10 min. each day to practicing with your paddles
- List of panagrams
- List of Call Signs (e.g. from DX Cluster)
- Look around the room and/or send whatever comes to mind or what you might say in a QSO
- BEST: Get on the air and rag chew
- Use your paddles in SST or POTA activations
- Try sending slightly above your comfort zone (off the air)



Evaluate Your Fist

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- Programs exist that evaluate your sending
 - Iambic Master + Winkeyer
 - FLwkey + Winkeyer
 - Morseino
 - Role your own (nanoIO, K3NG, ...)
- Other options
 - Use a code reader (ONLY FOR THIS PURPOSE!!!!)
 - Listen to a recording of your sending





Paddling Practice on My Keyers

CW Academy

Sending Practice by AA2IL

How quickly daft jumping zebras vex. |

☒ Panagrams ☐ Call Signs ☐ Letters ☐ Letters+Numbers ☐ Special Chars ☐ All Chars ☐ Stumble ☐ QSO ☐ Book

Paddles: 25 Monitor: 0

Previous Next Quit

pyKeyer by AA2IL

File Batter Up VFO A VFO B A->B Swap SO2V DX Split Paddles: 25

Call	Name	Exchange	Super	Check	Partial
~S022s~U022u ~S024s~U024u ~S025s~U025u NST TEST QUICK FOX JUMPS NIGHTLY ABOVE WIZARD. HOW Q~CKLY DAFT JUMPING ZE BRAS }X. HOW QUICKLY DAFT JUMPING ZEBRAS VEX.					

CQ	Reply	TU/QRZ?	Call?	AA2IL	S&P Reply	?	Log QSO	Name 2x	No. 2x	NAME?	NR?
QRZ?	TU/QRZ?	TU/QRZ?	Call?	His Call	S&P 2x	AGN?	RR				QRL?

Macros: CWT WPM: 25 None Send QRZ ?

+2 WPM -2 WPM QSO Rate:



“Squeeze” Sending

- CWops encourages use of paddles and electronic keyers
 - Cleaner fist at faster speeds
 - Most ops “hit a wall” at 15-20 wpm using a straight key
 - Eventually, you will hit a wall with a keyer also → keyboard sending
- There are two types of paddles
 - Single lever
 - Dual lever
- With a dual lever paddle, you can “squeeze” the levers together to form letters with alternating dit/dah patterns:
 - Reduces number of “motions” required to form a symbol
 - A, C, K, N, R, period, ...
 - Can even combine squeeze technique with “non-squeeze” to form most other symbols
 - L, F, Q, Y, ...



“Squeeze” Sending (cont.)

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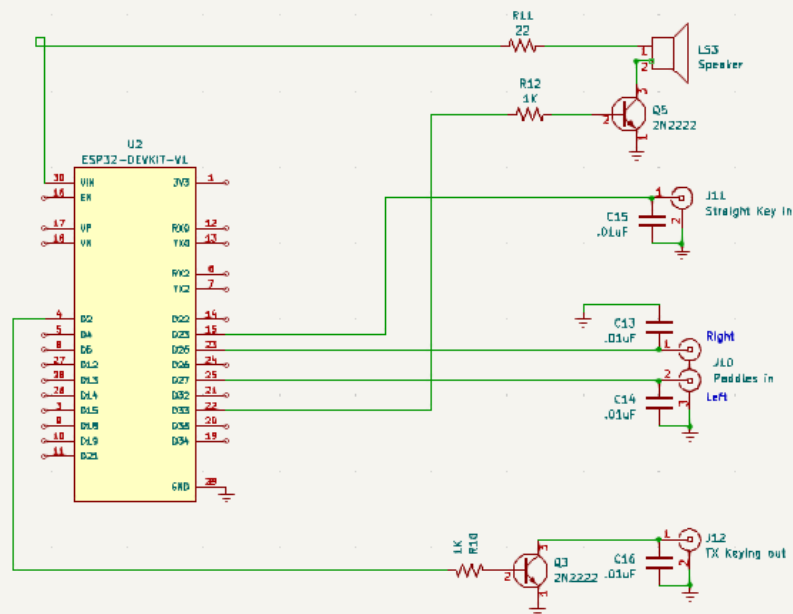
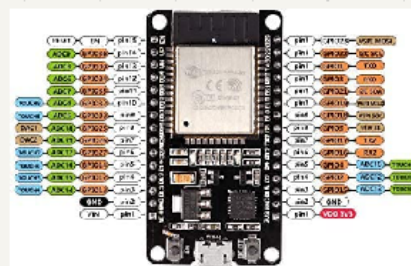
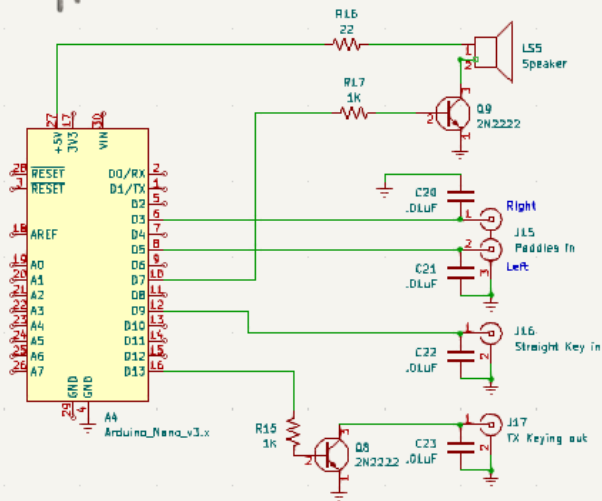
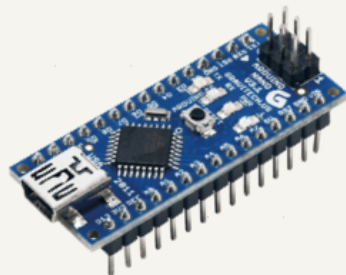
- If you don't “squeeze,” there is no real difference between single and dual-lever paddles
- The advantage of squeezing dual-paddles over a single-lever paddle is not nearly as much as using an electronic keyer over a straight key
 - HST guys use single-lever paddles because less prone to making mistakes
- There are two Iambic “squeeze” modes:
 - Mode A: Sending stops after current element is sent
 - Mode B: Alternate element is sent before sending stops
- Excellent video demonstration by AA4OO:
 - <https://www.youtube.com/watch?v=6R4t3Wq1Gic>



Homebrew Arduino Nano Keyer/Code Practice Oscillator

CW Academy

- A number of keyers are commercially available and are quite popular, e.g.
 - Winkeyer
 - Morseruino
- You can easily “roll your own” using a micro-controller (Arduino, ESP-32, ...)
 - This is a much cheaper option, especially if you have a well-stocked junk box
 - K3NG – Has every feature imaginable and includes Winkeyer emulation
 - Fldigi Nano IO (W1HKJ) – easily fits in an arduino nano
- I use adaptations of both the Nano IO and K3NG/Winkeyer emulator
 - Full schematics and firmware source are available at <https://github.com/aa2il/nanoIO>
 - Doubles as a code practice oscillator and gives you feedback on your timing
 - Minimal parts count



AA21L

Sheet: /ESP32 Keyer1/

File: ESP32-Keyer.kicad_sch

Title: Two versions of bare-bones keyer

Size: A4

Date:

Rev:

KiCad E.D.A. kicad 7.0.10-7.0.10-ubuntu22.04.1

Id: 4/4