



CW Academy

CWA Advanced Class Notes

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January-February, 2024



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



CW Academy

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
- ???



CW Academy

Philosophy

- 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



CW Academy

About AA2IL

- 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!





CW Academy

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

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- 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
- Get on the air!
 - There's always rags to chew, POTA/SOTA/SES stations ...
- Sending
- Word game drill
 - Animals
 - Colors



CW Academy

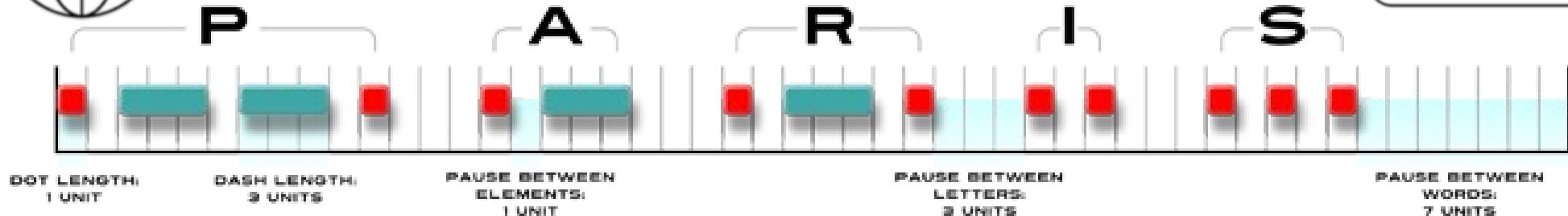
CW Sending

- 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!!!**



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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
- WPM = No. Times we can send this standard word in a minute = 60 sec. / (50 T)
- **T = 1.2/WPM seconds**
- e.g. For 25 WPM, each dit is $1.2/25 = 0.048$ s = 48 ms



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Sending Practice Ideas

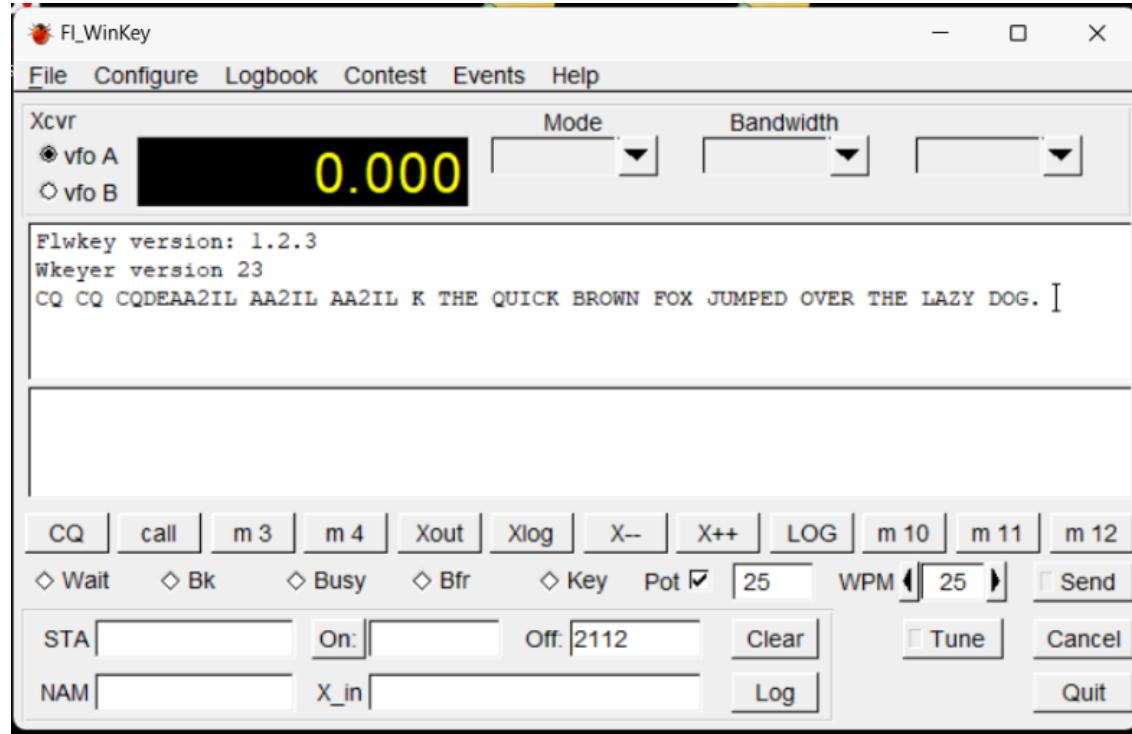
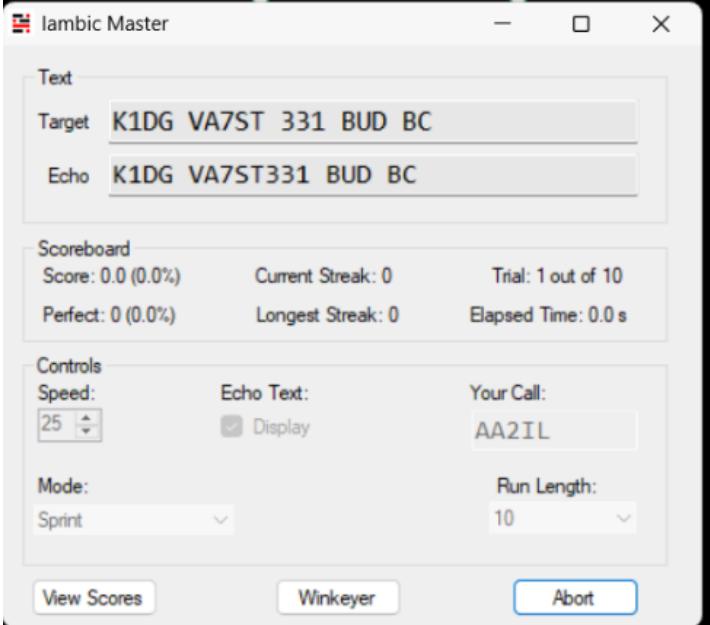
- Devote at least 5-10 min. each day to practicing with your paddles
- List of Panagrams
- List of Call Signs (e.g. from DX Cluster)
- Look around the room and/or send whatever comes to mind or what you might say in a QSO
- BEST: Get on the air and rag chew
- Use your paddles in SST or POTA activations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



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Evaluate Your Fist

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





Paddling Practice With My Keyer

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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: | | |



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“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.)

- 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

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- 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



Week 1 - Session 2

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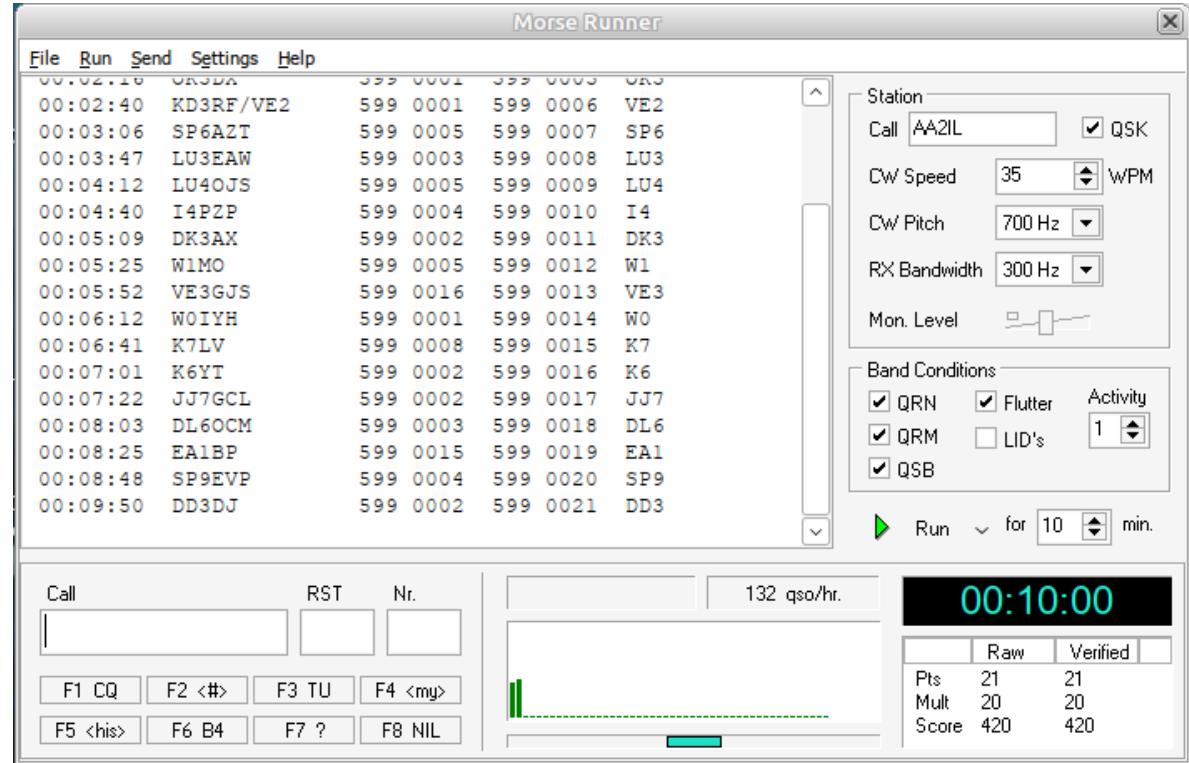
- Questions on h/w & on the air activities?
- The NAQP CW contest is on Saturday
 - Exchange is NAME and STATE (same as SST)
 - One of my favorites because power is limited to 100W and lasts only 12-hours
- **Morse Runner CE** has several different contests
 - <https://github.com/w7sst/MorseRunner>
- **Iambic Master** is a program for Winkeyer to help you with your sending
 - <https://sites.google.com/site/korkowp1/iambic-master>
- Contesting Intro
- Drill: Simulated SST & NAQP
 - Each student gets to run and others call
 - Muley and I might just jump in on this one



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Morse Runner

- Morse Runner is a realistic simulation of a contest environment
 - Signal effects
 - Multiple callers
 - Lids, etc.
- Experiment with the various settings to find where you are comfortable
 - I recommend setting the **Activity** level to 1 and turning off **LIDs**
- Introduce more effects as you become more proficient





CW Academy

Why Radio Sport?

- Major activity in our hobby
- Fun Competition
 - Some say its the most fun you can have with your clothes on
- Become a better operator
 - Difficult conditions
 - Emergency Comms
- Quickly rack up entities for “paper chasing” (WAS, DXCC, DX Challenge ...)
 - Regular Participation in CWTs is easiest path to CWops membership
- Dormant bands suddenly light up
- Test effectiveness of your station
- ...



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Some Terminology

- **Runner**

- Station Calling CQ to solicit contacts
- Usually achieve a higher QSO rate, especially if you are a “big gun”
- Need to be able to recognize calls and exchanges without too many repeats

- **Search and Pounce (S&P)**

- Tune across band answering runners
- Often lower rate because you are tuning and competing with other S&Pers
- Much easier than running since you can listen to runner until you get call and info
 - Be careful with serial numbers, not always consecutive
- Often a better strategy for “little pistols” in larger contests

- Some mix of these is needed to work everybody

- I do a lot of this



SST Weekly Practice Contest

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- “Slow” Speed Test
- Friday 2000z and Monday 0000z
- Very Relaxed Pace - Speed limit is 20 wpm
- Exchange: NAME and STATE/PROVINCE

CQ SST KC6EOA



KC7TAK

KC7TAK TU BRAD CA

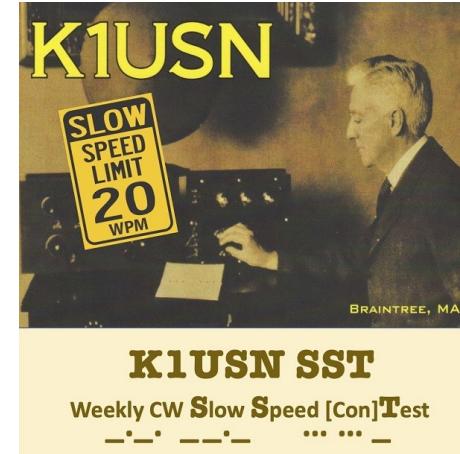


GE BRAD RYAN OR

GL RYAN 73 KC6EOA



- If you miss something: ?, AGN, CALL?, NAME?, QTH?, KC7?, TAK? ...
- Great place to get used to contesting and to try running





North American QSO Party

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- Twice each year for each mode - CW, SSB & RTTY
- Saturday 1800z – Sunday 0600z
- Single Ops only operate for 10 of 12-hours
- 100W Power limit
- Exchange: NAME and STATE/PROVINCE

CQ NA VA4ADM



WE7DW

WE7DW PAVEL MB

TU DAVE OR

TU VA4ADM

- Note: No “fluff” in exchanges



Week 2 - Session 3

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- Everyone please mute and use the SPACE BAR as a PTT
- Go over h/w and on air activities
- We're in the middle of the winter contest season:
 - NAQP SSB
 - ARRL VHF+
- DX - If you have any ambitions of “working them all:”
 - Clipperton Island (TX5S) should be QRV soon
- More Contesting
- MST



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Some More Terminology

- **SO1R/SO1V** – Single Operator, One Radio/One VFO
 - Most of us mere mortals
- **SO2V** – Single Operator, Two VFO's
 - One transmitter and two receivers (one in each ear)
- **SO2R** – Single Operator, Two (or more) Radios
 - Generally running on one radio and searching for multipliers on the other
- **2BSIQ** – Two-band Simultaneous Interleaved QSOs
 - Running on two bands, alternating CQ calls
- **Multi-Operator**
 - Larger contest stations with two or more ops



Some Contest DOs ...

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- **Do**

- Start off S&Ping until you build up skills and confidence
 - This is all many ops ever do
- If you are running, ask for a repeat if you have **any** doubt about what you copied
 - You only get one chance at the caller
- If you are S&Ping, you can either ask for a repeat or just listen to his next QSO
 - Be careful about serial numbers!
 - When you are starting out, listen before and after so not to slow down runner
- When you ask for a repeat, try to be specific which element that you missed
 - NAME?, NR?, QTH?, AGN?, ?
- If the runner misses your call, send it again then give your exchange
 - Courtesy demands that we look out for each other
- Be courteous but concise
- QRS if caller is slower or conditions are difficult (e.g. flutter or multipath)
- After the contest, record your claimed score at 3830scores.com and submit your log to contest sponsor



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... and DON'Ts

- **Don't** send unnecessary information
 - Runner's Call
 - He knows what it is and its your problem if you are S&P and get it wrong!
 - DE before your call or NR before your Serial Number
 - Wastes time, throws off timing and can be confusing
 - Signal report if it is not part of the contest exchange
 - Anything other than 5NN (or ENN) if a signal report is required
 - “Flow control” prosigns, e.g. K, BK, ...
 - Long greetings/chatter
 - SST and MST are exceptions as friendly greetings are encouraged
 - I do like to send a quick comment to people I know
 - Some contests are very slow, e.g. VHF+, so chatter is acceptable
- Bottom line is we want to keep things moving!!!



MST Weekly Practice Contest

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- ICWC Medium Speed Test
- Monday 1300z and 1900z, Tuesday 0300z
- Relaxed Pace - Speed limit is 25 wpm
- Exchange: NAME and SERIAL No.

CQ MST WB3ERS

KC6EOA TU NAT 28

TU BRAD 73 WB3ERS

N7AUE TU NAT 29

TU MULEY 73 WB3ERS

KC6EOA

TU BRAD 17

N7AUE

TU NAT MULEY 24



You don't need to wait for another CQ

- Another great place to build up confidence and skill



Week 2 - Session 4

CW Academy

- Questions on h/w & on the air activities?
 - Short Story was on Sending!
- TX5S (Clipperton Island) QRV is imminent
- NAQP SSB is on Saturday
- The January VHF+ Contest is this weekend
 - Exchange is 4-character maidenhead grid square (e.g. DM12)
 - Look for CW activity 50.09 MHz +/- and 144.2 MHz +/-
 - Look for SSB activity around 50.125 MHz, 144.2 MHz and 432.1 MHz, all +/-
 - Look for FM activity around the calling frequencies: 144.52 MHz and 446.0 MHz (Check the rules!)
 - FT8 dominates 6m with sporadic activity on 2m and 70cm
- Tonight: CWT



CWT Weekly Practice Contest

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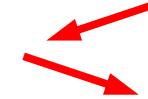
- Wednesday 1300z and 1900z, Thursday 0300z and 0700z
- Very popular and very fast – “average” speed ~39 wpm
- Exchange: NAME and MEMBER No. or STATE or “CWA”

CQ CWT AA2IL



KC7TAK

KC7TAK JOE 3177



TU RYAN WA

or RYAN CWA

TU AA2IL



or R or EE or TU (w/o my call)

- If you are aspiring to become a member of CWops, this is the easiest place to get your call recognized and build up the necessary sponsorship



The CWT is a Unique Beast

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- Goals for participants vary
 - Make as many contacts as possible in an hour
 - Sharpen or maintain skills
 - Enjoy QRQ CW
 - Try new equipment, h/w, s/w, techniques ...
 - ...
- Each session is only an hour and not scored
- Most ops are using Call History
 - Once you get call sign, you've have everything
 - Generally no need to ask for repeats of exchange
- Recommendations
 - CWA Students should NOT use call history
 - Check your copy against the Club Roster or Call History



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VHF+ Contesting

- Several times each year – January, **June, July** and September
- All modes, work each station once per band regardless of mode
- Propagation is MUCH more unpredictable than HF!
- A common practice is once you make a contact with someone, ask them to move around to different bands
- Exchange: 4-character Maidenhead Grid Square



- Pace is generally relaxed so friendly greetings & chatter are acceptable



Week 3 - Session 5

CW Academy

- Go over h/w and on air activities
- On the air – its winter contest season!
 - CQ 160m CW
 - Winter Field Day
 - Lots of DX!
- Anatomy of a QSO – Part 1
 - Hit and Run
 - Short and Sweet QSOs
- Tonight: Short QSOs
 - DX/POTA/SOTA, etc.
 - Each op gets to run and the others call



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“Hit and Run” QSOs

- By convention, a valid QSO must exchange some type of information in addition to call signs
- The minimal amount of “information” is a signal report (however meaningless it might be)
- Example – A “rare” DX station running a pile-up
 - His goal is to work as many stations as possible
 - Your goal is to bag an ATNO

CQ 3B7M UP



WB3ERS

WB3ERS 5NN



TU 5NN or 5NN 73 or 5NN WA

R 3B7M UP



- Contest exchanges (and FT4/8) obviously fall into this category also



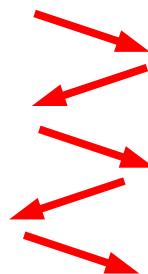
Short QSOs

- Special Event, POTA, SOTA, etc. ops also are generally trying to work as many stations as possible so they might only send a 5NN signal report (or RST + STATE)
- Some ops will exchange more meaningful information quickly (e.g. Actual RST+STATE+Op NAME)
- Example – A not-so-rare DX station who's not in a hurry:

CQ CQ CQ SV2HUD SV2HUD

KC6EOA GM 559 OP VAS VAS BK

QSL BRAD TNX ES 73



KC6EOA KC6EOA

GM VAS UR 569 569 IN CA CA OP BRAD BRAD BK

TU VAS 73 GL

- He may or may not want to engage further depending on conditions (QSB, QRN, etc.) or demand



Week 3 - Session 6

CW Academy

- Go over h/w and on air activities
- On the air:
 - CQ 160m CW
 - Winter Field Day
 - Lots of DX!
- Chasing DX
 - The bands have come back to life!
 - DXpeditioners are traveling again
 - Look for increased activity in the fall & winter, especially in the days surrounding the major International contests



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Chasing (Rare) DX

- This is quintessential ham radio and, for many, its most exciting aspect
- CW is the best mode for working weak stations rapidly
 - For better or worse, much DX activity has migrated to FT8
 - Most DXpeditions will include CW as part of their efforts
 - Occasionally, a smaller DXpedition will not use CW so you need to be flexible
- Your QRQ and contesting skills will serve you well!
- The Internet and SDR have changed the landscape
 - Instant pile-ups once a rare station is spotted
 - A Panadapter gives you “situational awareness”
 - Can do this to some extent with dual VFOs or XIT/RIT
 - Radios with dual receivers are an advantage
 - Consider using a WebSDR, be creative!
 - Embrace it and use it to your advantage!



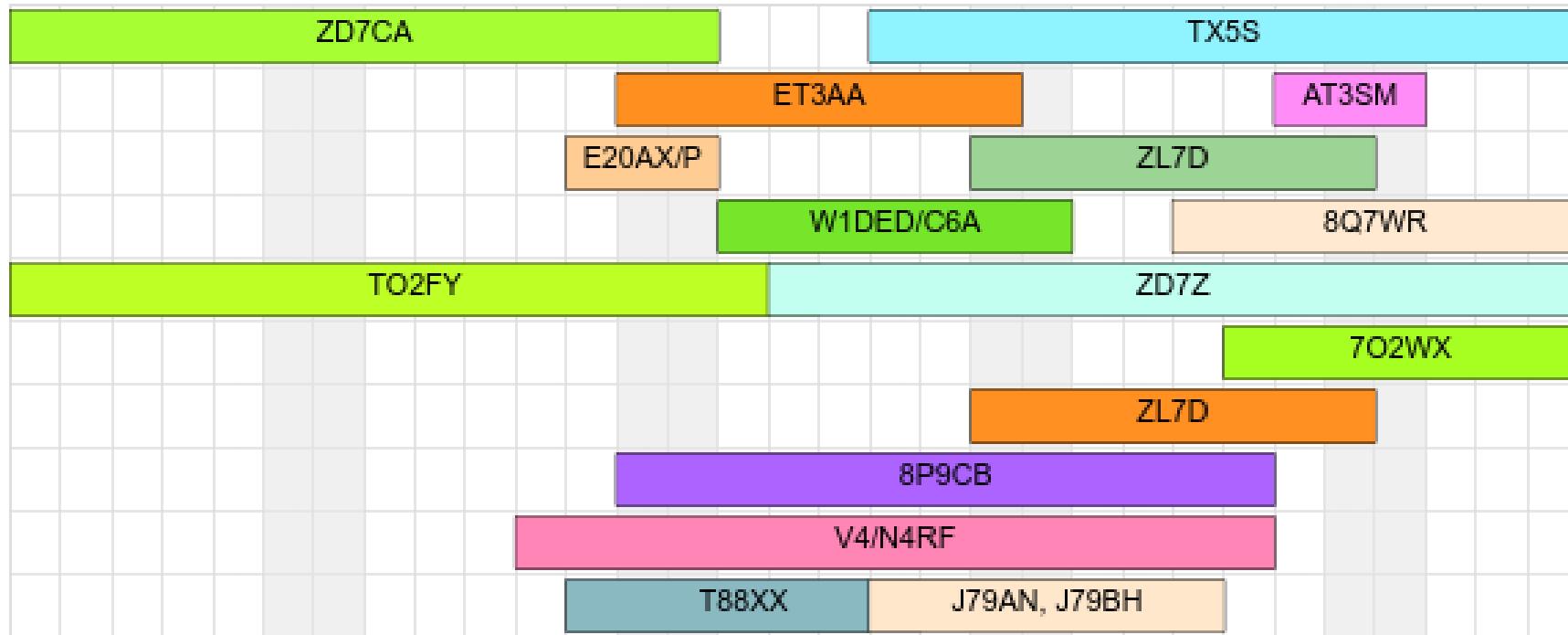
Up-coming DXpeditions

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FEATURED DXPEDITIONS TIMELINE

Last update: January 15, 2024



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



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Chasing DX (cont.)

- **Do:**

- **Listen Listen Listen and Listen** some more !!!!!!!!!!!!!!!
 - Make sure you can hear him and verify his call!
- Figure out his timing and where he is listening – and then transmit accordingly
 - Often listening UP 1-KHz or more, depending on demand
- Use full QSX (break-in) and “Split”
 - Learn how to rapidly use dual VFOs and/or XIT/RIT functions on your rig
- Be courteous and concise
- Understand Propagation and Be Patient
- Take a look at QRZ.com and/or the DXpedition website for operating plans and QSL info

- **Don’t** be the lid who:

- Tunes up and/or transmits on top of the DX!!!
- Continues to operate simplex when the DX is running split (TX5S **UP**)
- Continues to call when the DX is clearly calling someone else
- Thinks he’s the “DX Police” (These guys usually cause more QRM than the errant simplex op!)



My Contact with D60AE (Comoros) Fall 2022

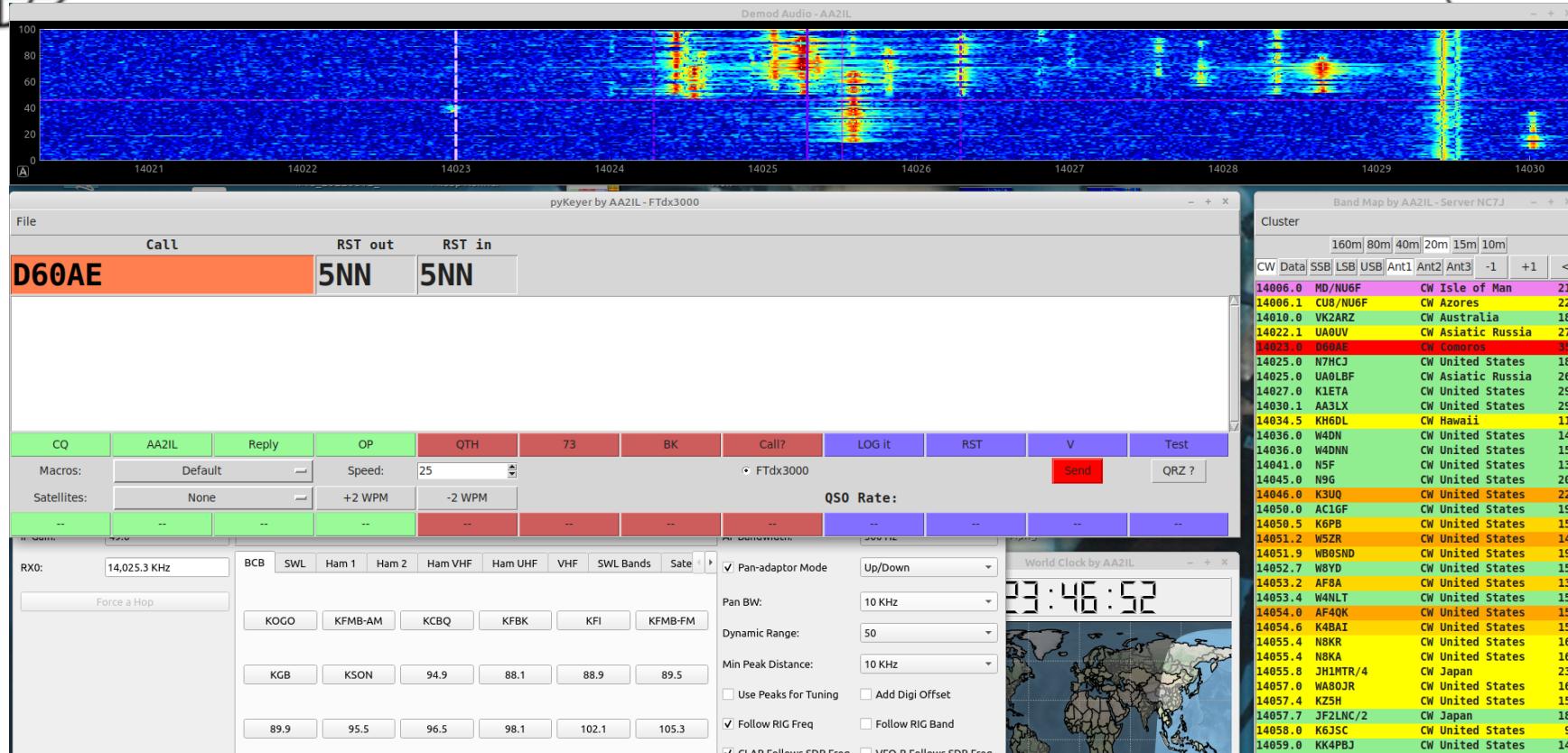
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- Turned on radio to participate in an SST
- Saw D60AE Spotted on 20m – clicked on it
- He was ~539 and a large pile-up extending up ~10 KHz
- Watched SDR waterfall to see who he was working and his patterns
 - About 7.5 KHz up, slowly moving down
- Set my rig to “split” while listening to a few more contacts
- Moved my XIT down a little more, threw out my call
 - After 4 or 5 tries, he came back with WW2IL
 - I sent AA2IL one more time, he responded correctly
 - Don’t send him your exchange until he gets you call correct
 - Exchanged 5NNs and 73s
 - Confirmed “In the Log” the next day on Clublog
- Remember, my station is a “little pistol” - 100 W and wire antennas
 - ~10,500 miles distance



Contact with D60AE (Comoros)

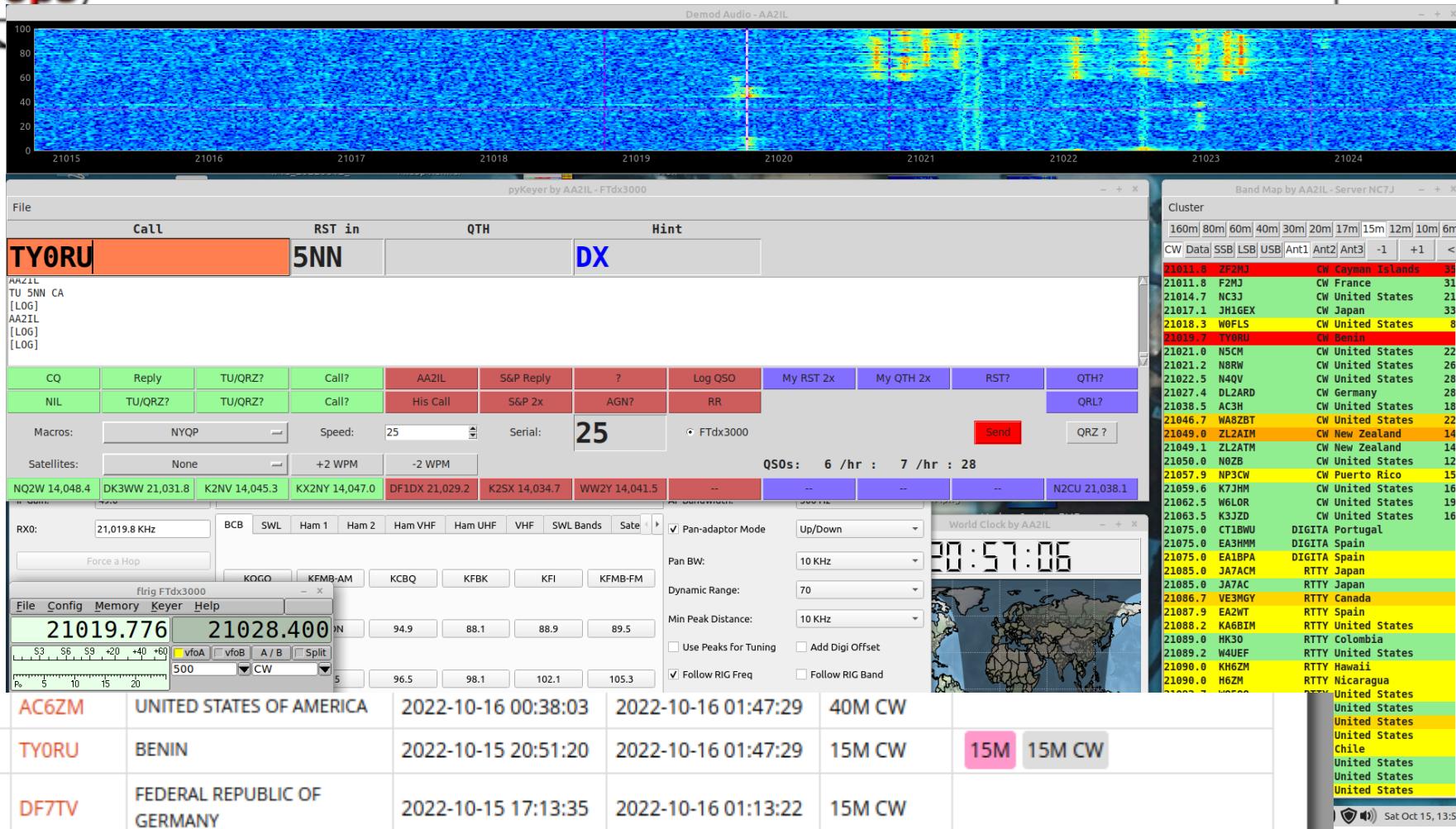
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Contact with TYORU (Benin)

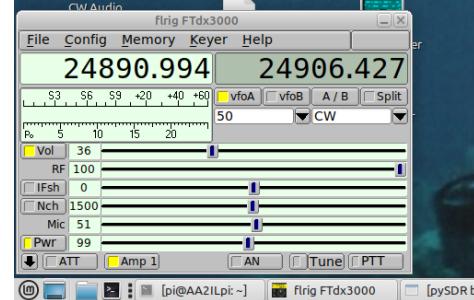
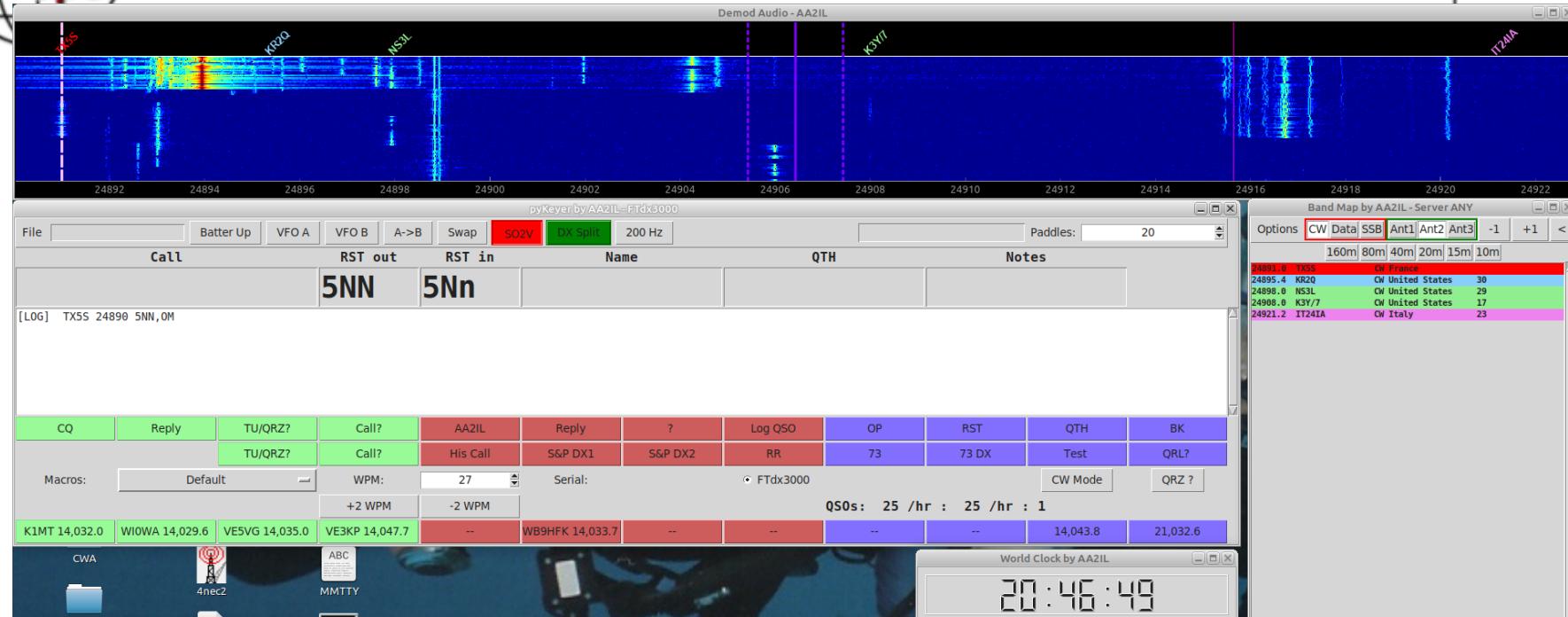
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Monday - TX5X (Clipperton Isl.)

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| DX Call | Entity | QSO Date | Match Date | Band/Mode | Outcome |
|---------|--------------------------|---------------------|---------------------|-----------|--------------------|
| VP2ETE | ANGUILIA | 2024-01-22 21:28:01 | 2024-01-22 21:55:52 | 12M Data | |
| TX5S | CLIPPERTON ISLAND | 2024-01-22 21:12:45 | 2024-01-22 21:55:52 | 17M Data | 17M Data 17M Data |
| TX5S | CLIPPERTON ISLAND | 2024-01-22 20:39:55 | 2024-01-22 21:55:52 | 12M CW | 12M 12M CW |
| TX5S | CLIPPERTON ISLAND | 2024-01-22 20:08:22 | 2024-01-22 21:55:52 | 20M CW | DXCC 20M CW 20M CW |
| W0EJ | UNITED STATES OF AMERICA | 2024-01-22 19:31:34 | 2024-01-22 21:55:52 | 20M CW | |



Week 4 - Sessions 7 & 8

CW Academy

- Jim Led this one
 - Handling mistakes
 - The Muley Map
- This weekend:
 - VT, MN and BC QSO Parties
 - NA CW Sprint



CW
op

The Muley Map

Academy





Week 5 – Session 9

CW Academy

- Go over h/w and on air activities
- This weekend
 - CQ WPX RTTY
- Anatomy of a QSO – Part 2
 - Rag Chewing
- Practice “cookie cutter” Rag Chews
 - CQ/Greeting
 - “Big Three:” RST, Name, QTH



CW Academy

RTTY Contesting

- Many CW contesters also enjoy RTTY contesting
 - Fast paced, rates can approach those of CW
 - Most modern rigs have soundcard built-in so easily plug-and-pray
 - Signaling is not as efficient as CW but higher than voice
 - Ops tend to naturally spread out so its not the QRM-fest typical of FTx contests
- Good place to experiment with SO2R/SO2V and/or Sprints
 - Decoding is off-loaded to your computer so you can concentrate on juggling two radios
- **Do NOT use cut numbers**
 - All symbols are 5-bits
 - Cap. letters, digits, punctuation and control characters are obtained by switching between two tables with 32-symbols each
 - Result is that it actually takes longer to send 5NN than 599
- **Send <CR> and spaces before and after your messages** to help separate from noise/garbage
- See rttycontesting.com for more info



CW Academy

Rag Chew QSOs

- There's no precise definition for a "rag chew" QSO but they generally begin with "the big three"
 - Signal Report (RST)
 - Location (QTH)
 - Name (OP)

CQ CQ CQ DE AA2IL AA2IL AA2IL K

AA2IL DE KB1FGC KB1FGC KN

**KB1FGC DE AA2IL = GE OM ES TNX FER CALL = UR 57N 57N IN RAMONA, CA
RAMONA, CA, ABT 30 MILES NE OF SAN DIEGO = NAME HR IS JOE JOE = HOW
CPY? <AR> KB1FGC DE AA2IL <KN>**

**AA2IL DE KB1FGC RR FB JOE TNX FER RPRT, SOLID COPY = UR RST 55N
55N = OP RICH RICH ES QTH PROSPECT, CT PROSPECT, CT = SO HW? BK**



CW Academy

Rag Chew QSOs (cont.)

- At this point, we can continue the QSO or politely end it

**KB1FGC DE AA2IL = RR SOLID CPY RICH ES GUD TO MEET U = XYL IS RINGING DINNER
BELL SO MUST SAY 73 FOR NW = HPE CU AGN SN = 73 <SK> KB1FGC DE AA2IL <KN>**

**AA2IL DE KB1FGC = FB JOE TNX FER QUICK CHAT ES WILL LOOK FER U AGN 73 73 <SK>
AA2IL DE KB1FGC K EE**

EE

- There is a lot more detail than in a “Hit an Run” QSO
- A lot of jargon and abbreviations are used to shorten the messages
- I like to use the “break” or “double dash” (=,<BT>) to separate various thoughts and also to bide a little time while I’m thinking of the next thing to say
- I also like to use accepted pro-signs to help with flow of transmissions



CW Academy

Common Abbreviations

| ABT | About | FT | Feet | PWR | Power | WX | Weather |
|-------|-----------------------------|-----|-------------------|------|----------------------|-----------|---------------------------|
| AGN | Again | GA | Good afternoon | R | Roger, Decimal point | XCVR | Transceiver |
| ANT | Antenna | GB | God bless | RIG | Radio equipment | YL | Young lady |
| B4 | Before | GBA | God bless America | RPT | Report | YR | Year |
| BK | Back to you | GD | Good day | RPRT | Report | YRS | Years |
| BTU | Back to you | GE | Good evening | RCVR | Receiver | XYL | Wife (Ex-young-lady) |
| BURO | QSL Bureau | GL | Good luck | RX | Receiver | 73 | Best regards |
| C | Yes ("Si") | GM | Good morning | SIGS | Signals | 88 | Hugs and Kisses |
| CONDX | Conditions | GN | Good night | SRI | Sorry | | |
| CPY | Copy | GUD | Good | TKS | Thanks | <AR> | End of Message |
| CU | See you | HI | Laugh | TNX | Thanks | <AS> | Stand by |
| CUL | See you later | HPE | I hope/I hope to | TU | Thank you | <BT> | Break |
| CQ | Calling anyone ("Seek You") | HR | Here | TX | Transmitter | K | Go (anyone) |
| DE | From ("de") | HW | How | U | You | <KN> | Go only |
| DR | Dear | LID | Bad operator | UR | Your/You're/You are | <SK> | End of contact |
| DX | Long-distance | NIL | Nothing | URS | Yours | | |
| EL | Element | NR | Near | VERT | Vertical | BN | BEEN |
| ES | And | OM | Old Man | VY | Very | MT | MEET |
| FB | Fine business | OP | Operator | W | Watt(s) | And so on | And so on and so on |
| FER | For | PSE | Please | WID | With | | |



Week 5 - Session 10

CW Academy

- Go over h/w and on air activities
- This weekend
 - CQ WPX RTTY
- Anatomy of a QSO – Part 2 (cont.)
 - Rag Chewing
- Practice “extended” Rag Chews
 - Rig, Antenna, Weather, Ham Adventures, Professional Career, Family, ...



CW Academy

Rag Chew QSOs

- There's no precise definition for a "rag chew" QSO but they generally begin with "the big three"
 - Signal Report (RST)
 - Location (QTH)
 - Name (OP)

CQ CQ CQ DE AA2IL AA2IL AA2IL K

AA2IL DE KB1FGC KB1FGC KN

**KB1FGC DE AA2IL = GE OM ES TNX FER CALL = UR 57N 57N IN RAMONA, CA
RAMONA, CA, ABT 30 MILES NE OF SAN DIEGO = NAME HR IS JOE JOE = HOW
CPY? <AR> KB1FGC DE AA2IL <KN>**

**AA2IL DE KB1FGC RR FB JOE TNX FER RPRT, SOLID COPY = UR RST 55N
55N = OP RICH RICH ES QTH PROSPECT, CT PROSPECT, CT = SO HW? BK**



CW Academy

Rag Chew QSOs (cont.)

- If we both choose to continue the conversation, there are a lot of things to talk about:

KB1FGC DE AA2IL = RR SOLID AGN = RIG HR IS A YAESU FTDX300 ABT 100W TO A MOXON BEAM UP 30 FT = WX HR TODAY SUNNY AND HOT, TEMP NR 100 DEG F = SO BTU RICH <KN>

R FB JOE DIDNT MISS A DIT = UR RIG AND ANT DOING NICE JOB HR IN CT = RIG HR IS KNWD TS2000 WID AMP RUNNING 500W TO A DIPOLE UP 45 FT = WX HR IS COOL AND RAIN, TEMP IN LOW 50S = FALL IS HR IN THE GREAT NE = BTU JOE KN

VY GUD RICH = I GREW UP IN UPSTATE NY AND MISS THIS TIME OF YR = WENT TO THE BEACH WID MY XYL YESTERDAY TO REMIND US WHY WE LIVE HR HI HI = I RETIRED LAST YR AFTER 35 YRS AS AN ELEC ENGR = NW I HV LOTS OF TIME TO PLAY RADIO = WHAT DO YOU DO FOR WRK RICH? <KN>

AA2IL DE KB1FGC R SOLID AGN JOE = MY FAMILY RUNS AN ANTIQUE TRUCK MUSEUM AND I USED TO DRIVE BIG RIGS = BEEN A HAM FER 25 YRS, I ENJOY CW RAG CHEWING AND CHASING DX. I ALSO LIKE TO REPAIR VINTAGE RIGS AND IM WORKING ON A SATELLITE SETUP

...

- ... and so on and so on
- Be sure to identify every 10-minutes
- Keep subject matter friendly and upbeat and non-controversial
- Keep exchanges short – don't dominate the conversation



CW Academy

Rag Chew Drill

- For practice tonight, operate as if you've met the other op before::

CQ CQ CQ N5GG N5GG K

N5GG DE AA7TO AA7TO KN

AA7TO DE N5GG = GE JR ES GUD TO CU AGN = UR 57N 57N IN DALLAS = HOW? BK

RR HI COLIN GUD TO HEAR U ALSO = UR 5NN IN LAS VEGAS, FB SIG = RIG HR IS
ICOM 7300 100W TO A VERTICAL ON MY TRUCK = WX HR IS HOT AND DRY, TEMP IN
LOW 90S = BTU COLIN KN

VY GUD JR SOLID CPY = RIG HR IS TS450 100 W TO A DIPOLE AT 40 FT = WX TODAY
WAS HOT AND HUMID, SUMMER HAS ARRIVED BK

RR FB COLIN = YOUR TS450 DOING A GREAT JOB = IT WAS GUD CHATTING WITH
YOU AGN, I NEED TO QRT NW = HPE CU SOON 73 73 <SK> N5GG DE AA7TO K

OK JR WILL LOOK FOR U AGN 73 <SK> AA7TO DE N5GG E E

E E



Week 6 - Session 11

CW Academy

- Go over h/w and on air activities
- This weekend is the ARRL International DX CW
 - “International” → We only work stations outside of the U.S.
 - We send 5NN + STATE/PROVINCE
 - DX sends 5NN + Power
 - The best strategy for “little pistols” is S&P for this one
 - Look for plenty of DX activity before and after the contest
 - Can you get DXCC in one weekend?
- Cut Numbers
- Math Drill



CW Academy

Cut Numbers

- Acceptable:
 - 0 → T
 - 1 → A
 - 9 → N
 - Creative (Avoid Using These!):
 - 0 → the letter O
 - 5 → E
 - 2 → U
 - 8 → D
 - 3 → V NO!!!!!! Sound too much like 4
 - 7 → B NO!!!!!! Sounds too much like 6
 - CQ WPX (e.g. Morse Runner):
 - 599 → ENN (signal report)
 - 1921 → AN2A (serial number)
 - Some ops are very creative!



Cut Numbers (cont.)

- In the CWTs and many of the larger contests (e.g. CQ DX, Intl DX), you will hear ops use abbreviations for numbers in the exchange
 - **599** → **5NN** or even **<ENN>** (Dummy signal report)
 - **11** → **AA** (CQ Zone 11 - Brazil)
 - **100** → **1TT** or **ATT** (100 Watts)
 - **99** → **NN** (99 Watts)
 - **1000** → **KW** (1 Kilowatt)
 - **1090** → **ATNT** (N4FP CWT Member No.)
 - **2198** → **UAND** (N5OT CWT Member No.)
- Other than the dummy signal report (5NN or ENN), I don't like this practice and advise against it
 - Eliminates the inherent redundancy which is very helpful in the presence of QRM and QSB.
 - However, others use it so you need to understand it!
- I find the easiest way to deal with a cut number is to log it and unwind the actual meaning later
- ~~One place where a cut number can be somewhat useful is~~ if you enter a contest late, you can send a leading "T" in your serial number to alert the other station to this:
 - **4** → **T4** or **TT4**
- I advise against sending leading zeros for numbers above 9
 - Don't send TT7 or T25 in MST, just 7 or 25 – very few ops get over 100 Q's in the MST



CW Academy

CW Math Drill

- 1 plus 2
- Is 3 R 3 times 5
- Is 15 R 15 div 3
- ? 15 div 3 Is 5 R 5 minus 1
- Is 6 NO 5 minus 1 Is 4 R ...
- Etc.
- Use ? Or AGN? for repeats and R to confirm answer
 - Try not using “voice” since you can’t do that on the air
- No Cut Numbers this time - We’ll do that next time



Week 6 – Session 12

CW Academy

- Go over h/w and on air activities
- On the air
 - ARRL International DX CW
 - The last “big” CW contest of the winter season
 - There is a lot of activity leading up to this contest
 - DXpeditions to Juan Fernandez Isl. And Guyana
 - Large efforts, Semi-rare entities
 - Conditions were excellent in the CWTs yesterday
- Math Drill with Cut Numbers
- Computers and Logging



CW Math Drill with Cut No.s

- A plus 2
- Is 3 R 3 times AT
- Is 3T R 30 div 3
- ? 3T div 3 Is 10 R AT minus 1
- Is AA NO 10 minus 1 Is N R ...
- Etc.
- Use ? Or AGN? for repeats and R to confirm answer
 - Try not using “voice” since you can’t do that on the air



CW Academy

Computers and Logging

- Computers are a fixture in most ham shacks now and are invaluable for contesting
 - Logging & Scoring
 - Keeping track of duplicates
 - Sending
- N1MM logger is the most popular logging program used for contesting
 - Many useful features
 - Windoz Only
 - ~~No comparable option~~ A clone is available for Linux (?)
- At this point, **you should be using a contest logger**
 - Its a good idea to let the computer do the **sending** for you, especially in the “fast” contests
 - The other ops will appreciate the “machine” code!
 - For S&P, you can also use the memory keyer in your rig for sending (e.g. Yaesu FH-2)
 - Use the “band map” to help with S&P (**verify** the call sign!)
- Try **not** to use the “call history files” and “auto-fill” until you can consistently copy exchanges
 - When you begin to use these features, you still need to verify that the information is correct!



CW Academy

Rig Memory Keyer

- Most (all?) modern rigs have a built-in memory keyer to which you can program several short messages
- My “default” messages are (mainly for quick DX contacts):
 - Msg 1 = AA2IL
 - Msg 2 = TU 5NN CA
 - Msg 3 = OP JOE
 - Msg 4 = 73
 - Msg 5 = BK
- For S&P in ARRL Intl DX, you might use something like this:
 - Msg 1 = AA2IL
 - Msg 2 = TU 5NN CA
 - Msg 3 = CA CA
 - Msg 4 = 73
 - Msg 5 = AGN? or ?
- Yaesu rigs also have a serial counter so feasibly, you use this facility to S&P in almost any contest
- **This is NOT cheating** – contesting is fatiguing and you want to employ any fair means that will maximize your Butt-In-Chair (BIC) time and therefore your enjoyment and score!!!

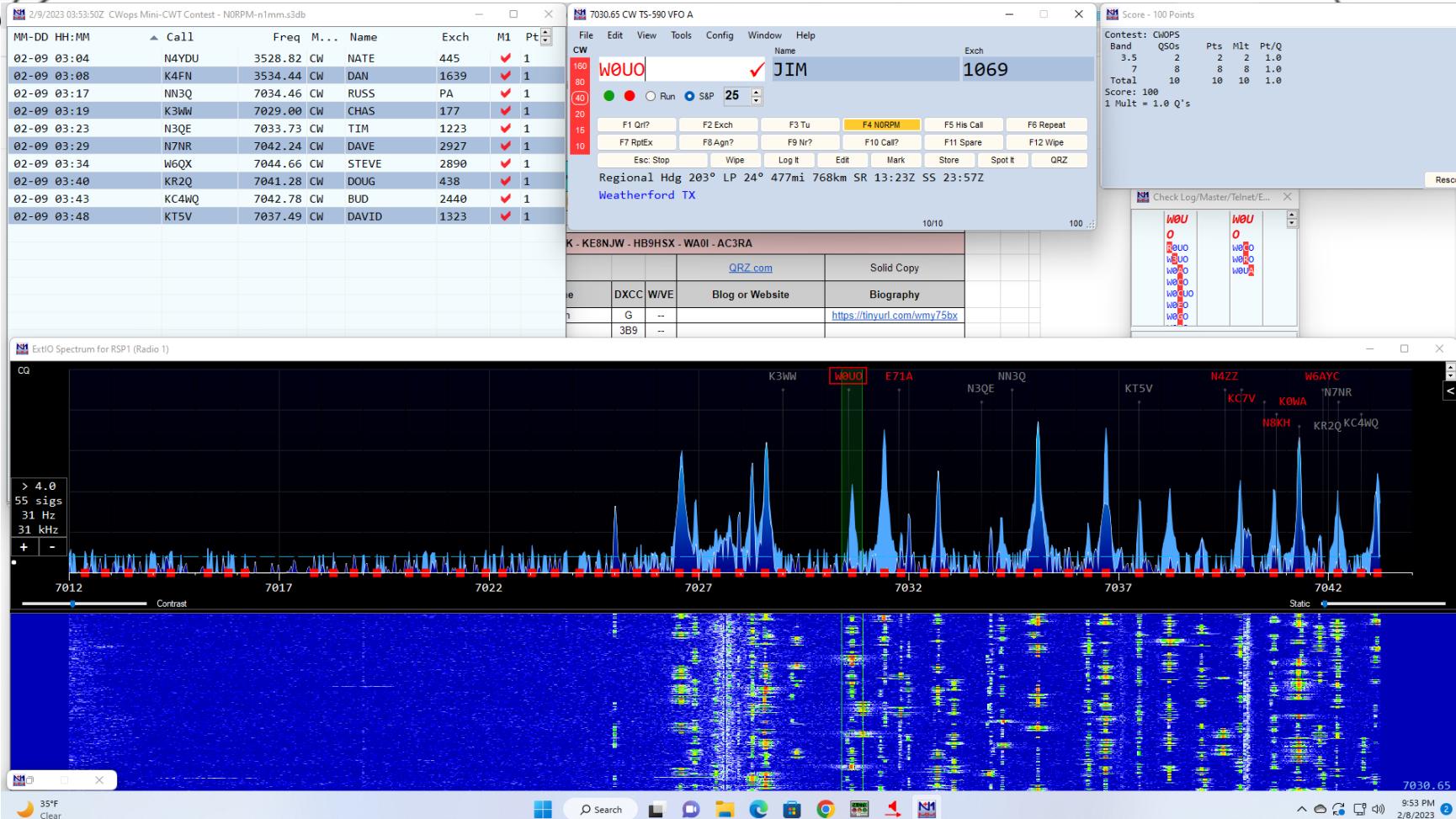




N1MM Logger

(Screenshot courtesy of N0RPM)

CW Academy





CW Academy

Other Loggers

California QSO Party

| | <p>57th Running Of The CQP! 1600 UTC October 1, 2022 to 2200 UTC October 2, 2022 CQP 2022 Begins: 2 :01 :37 :47 Days Hrs Mins Secs</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|----------------|-----------------|-------|---|--|---|-------|---|----------|--|--------|---|--------|---|-------------------------|---|--------|--------|--------------------|---|------|---|-----------------|---|---------|-----------------|
| <p>CQP Logging Software</p> <p>Top 10 Most Common Logging Software Programs Used in CQP Based On Logs Received in 2021</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"><thead><tr><th>Contest Logger</th><th>Links and Notes</th></tr></thead><tbody><tr><td>N1MM+</td><td><ol style="list-style-type: none">https://n1mmwp.hamdocs.comHow to log a county-line QSO in N1MM+</td></tr><tr><td>N1MM+ Call History File For 2022 Search for qsop_ca on this page:</td><td>https://n1mmwp.hamdocs.com/mnfiles/categories/callhistory/</td></tr><tr><td>N3FJP</td><td><ol style="list-style-type: none">http://www.n3fjp.com/How to log a county-line QSO in N3FJP</td></tr><tr><td>Writelog</td><td><ol style="list-style-type: none">https://writelog.comVersion 12.41 and after: Update of county line QSOs in Cabrillo file.How to log a county-line QSO in Writelog</td></tr><tr><td>DX Log</td><td>http://www.dxlog.net/</td></tr><tr><td>GenLog</td><td>https://www.qsl.net/w3km/</td></tr><tr><td>SkookumLogger (for Mac)</td><td>https://www.k1gq.com/SkookumLogger/</td></tr><tr><td>CQPWIN</td><td>CQPWIN</td></tr><tr><td>RUMLogNG (for Mac)</td><td>https://dl2rum.de/rumssoft/RUMLog.html</td></tr><tr><td>TR4W</td><td>https://www.tr4w.net/</td></tr><tr><td>TLF (for Linux)</td><td>https://tlf.github.io/</td></tr><tr><td>Utility</td><td>Links and Notes</td></tr></tbody></table> | | | Contest Logger | Links and Notes | N1MM+ | <ol style="list-style-type: none">https://n1mmwp.hamdocs.comHow to log a county-line QSO in N1MM+ | N1MM+ Call History File For 2022 Search for qsop_ca on this page: | https://n1mmwp.hamdocs.com/mnfiles/categories/callhistory/ | N3FJP | <ol style="list-style-type: none">http://www.n3fjp.com/How to log a county-line QSO in N3FJP | Writelog | <ol style="list-style-type: none">https://writelog.comVersion 12.41 and after: Update of county line QSOs in Cabrillo file.How to log a county-line QSO in Writelog | DX Log | http://www.dxlog.net/ | GenLog | https://www.qsl.net/w3km/ | SkookumLogger (for Mac) | https://www.k1gq.com/SkookumLogger/ | CQPWIN | CQPWIN | RUMLogNG (for Mac) | https://dl2rum.de/rumssoft/RUMLog.html | TR4W | https://www.tr4w.net/ | TLF (for Linux) | https://tlf.github.io/ | Utility | Links and Notes |
| Contest Logger | Links and Notes | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| DX Log | http://www.dxlog.net/ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GenLog | https://www.qsl.net/w3km/ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SkookumLogger (for Mac) | https://www.k1gq.com/SkookumLogger/ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CQPWIN | CQPWIN | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RUMLogNG (for Mac) | https://dl2rum.de/rumssoft/RUMLog.html | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR4W | https://www.tr4w.net/ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TLF (for Linux) | https://tlf.github.io/ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Utility | Links and Notes | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>ADDITIONAL LOGGING TOOLS</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



N3FJP Logger

(Screenshot courtesy of VA4ADM)

CW Academy

N3FJP's RAC Contest Log 3.6.5
www.n3fjp.com

File Settings Band Mode View Help

Current Band & Mode Find

Recent Contacts Last 20 All

| Rec | Call | Rcvd | PR/# | Snt | Date / Time | Bnd | Mode | Pnts | Country | # S |
|-----|--------|------|------|-----|-------------|-----|------|------|---------|-----|
| 684 | KD2KW | 599 | 84 | 599 | 12/30 20:12 | 15 | CW | 2 | USA | |
| 683 | WA2MCR | 599 | 195 | 599 | 12/30 20:12 | 15 | CW | 2 | USA | |
| 682 | VA3YV | 599 | ON | 599 | 12/30 20:11 | 15 | CW | 10 | Canada | |
| 681 | WA2JQK | 599 | 296 | 599 | 12/30 20:10 | 15 | CW | 2 | USA | |
| 680 | WK6I | 599 | 10 | 599 | 12/30 20:10 | 15 | CW | 2 | USA | |
| 679 | N2SO | 599 | 38 | 599 | 12/30 20:09 | 15 | CW | 2 | USA | |
| 678 | VE3KTB | 599 | ON | 599 | 12/30 20:09 | 15 | CW | 10 | Canada | |
| 677 | W7RG | 599 | 21 | 599 | 12/30 20:08 | 15 | CW | 2 | USA | |
| 676 | N6TQ | 599 | 158 | 599 | 12/30 20:08 | 15 | CW | 2 | USA | |
| 675 | VA3IJK | 599 | ON | 599 | 12/30 20:07 | 15 | CW | 10 | Canada | |
| 674 | NC8O | 599 | EA | 599 | 12/30 20:07 | 15 | CW | 2 | USA | |

Score Statistics

| | |
|-------------------------|---------|
| Total Contacts | 684 |
| Total QSO Points | 3,038 |
| Total Multipliers | 45 |
| Total Score | 136,710 |
| QSOs / Hr (Last 20 min) | 0 |
| QSOs / Hr (Last 60 min) | 0 |

Multippliers worked in current mode:

| Call | RSTr | Prov / Ser | RSTs | Country | 160 | 80 | 40 | 20 | 15 | 10 | CW F (Ctrl+Shift W) |
|-------|------|------------|------|--------------------|-----|----|----|----|----|----|-----------------------|
| AA2IL | | | | Belgium | NS | NS | NS | NS | NS | NS | F1: ((RAC)) VA4ADM VA |
| | | | | Bonaire | NS | NS | NS | NS | NS | NS | F2: \$ 5NN MB |
| | | | | Bulgaria | QC | QC | QC | QC | QC | QC | F3: TU VA4ADM ((TEST |
| | | | | Canada | ON | ON | ON | ON | ON | ON | F4: VA4ADM |
| | | | | Canary Is. | ON | ON | ON | ON | ON | ON | F5: 5NN MB |
| | | | | Chile | MB | MB | MB | MB | MB | MB | F6: NR NR? |
| | | | | Costa Rica | SK | SK | SK | SK | SK | SK | F7: AGN |
| | | | | Czech Republic | SK | SK | SK | SK | SK | SK | F8: QRL? |
| | | | | Dominican Republic | AB | AB | AB | AB | AB | AB | F9: VVV DE VA4ADM |
| | | | | England | AB | AB | AB | AB | AB | AB | F10: |
| | | | | European Russia | BC | BC | BC | BC | BC | BC | F11: |
| | | | | Federal Republic o | NT | NT | NT | NT | NT | NT | Settings |
| | | | | France | NB | NB | NB | NB | NB | NB | |
| | | | | Ireland | NB | NB | NB | NB | NB | NB | |
| | | | | Israel | NL | NL | NL | NL | NL | NL | |
| | | | | Italy | NU | NU | NU | NU | NU | NU | |
| | | | | Jamaica | YT | YT | YT | YT | YT | YT | |
| | | | | Mexico | PE | PE | PE | PE | PE | PE | |
| | | | | Norway | PE | PE | PE | PE | PE | PE | |
| | | | | Puerto Rico | PE | PE | PE | PE | PE | PE | |
| | | | | Romania | PE | PE | PE | PE | PE | PE | |

Possible Duplicate!

Clear Spot Last

Pos Dups / Partials Any Portion

AA2IL AA2IL AA2IL/6

Bearing: 237 Start tracking op time 08:21:59

Miles: 1,492 Band: 15 Mode CW

VA4ADM RS(T) MB 9:10:06 PM
03:10:06 UTC

Cont: NA

My Screen – Last Night's CWT

CW Academy

Demod Audio - AA2IL

pyKeyer by AA2IL - FTdx3000

Call **Name** **Exchange** **Super Check Partial**

| | | | |
|-------------|--------------|-------------|-----------------------|
| nf8m | FRANK | 1634 | NF8M EF8M NJ8M |
|-------------|--------------|-------------|-----------------------|

GM TU AA2IL [LOG] K4GM 7021 GE0,779
 CQ CWT AA2IL
 VE3EJ JOE 3177
 TU AA2IL [LOG] VE3EJ 7021 JOHN,513
 NF8M JOE 3177

| | | | | | | | | | | | |
|---------|---------|---------|--------|----------|-----------|----------|---------|---------|--------|-------|------|
| 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 | | | TEST | QRL? |
| Macros: | | | CWT | WPM: | 32 | FTdx3000 | | | | | |
| | | | +2 WPM | -2 WPM | | | | | | | |

QSOs: 144 /hr : 104 /hr : 76

| | | | | | | | | | |
|---------------|--------------|----|----|----|----|----|----|---------|----------|
| W1WEF 7,035.6 | N4ZZ 7,028.9 | -- | -- | -- | -- | -- | -- | 7,021.6 | 14,036.9 |
|---------------|--------------|----|----|----|----|----|----|---------|----------|

76 QSOs x 74 Uniques = 5624 Last Worked: VE3EJ

IF Bandwidth: 000 kHz **IF:** 0 KHz **IF Gain:** 50 **RX0:** 7,021.6 KHz

Pan-Adaptor Mode

World Clock by AA2IL

Band Map by AA2IL - Server W3LPL

Options CW Data SSB Ant1 Ant2 Ant3 -1 +1 <

| | 160m | 80m | 40m | 20m | 15m | 10m |
|----------------|--------------------|-----|-----|-----|-----|-----|
| 7000.9 DL4MFH | CW Germany | 15 | | | | |
| 7003.9 EA8AF | CW Canary Islands | 20 | | | | |
| 7005.5 JJ1JOQE | CW Japan | 18 | | | | |
| 7009.0 SM4OTI | CW Sweden | 26 | | | | |
| 7009.0 SM4TTI | CW Sweden | 26 | | | | |
| 7009.0 SM40 | CW Sweden | 27 | | | | |
| 7010.0 HABNZ | CW Hungary | 19 | | | | |
| 7012.0 YO9KWC | CW Romania | 33 | | | | |
| 7012.0 YO9CRC | CW Romania | 33 | | | | |
| 7018.6 RT4H | CW European Russia | 26 | | | | |
| 7020.5 NY3A | CW United States | 10 | | | | |
| 7021.6 AA2IL | CW United States | 31 | | | | |
| 7022.3 VE5MX | CW Canada | 38 | | | | |
| 7022.3 KESMX | CW United States | 35 | | | | |
| 7022.8 HA6NL | CW Hungary | 33 | | | | |
| 7023.1 KSVB | CW United States | 29 | | | | |
| 7023.1 K1SEI | CW United States | 31 | | | | |
| 7023.2 K7RI | CW United States | 38 | | | | |
| 7023.2 K7RT | CW United States | 39 | | | | |
| 7024.0 WBEAS | CW United States | 31 | | | | |
| 7024.0 WLTO | CW United States | 36 | | | | |
| 7024.6 WLTM | CW United States | 11 | | | | |
| 7024.6 SM51MO | CW Sweden | 32 | | | | |
| 7024.7 SM51M | CW Sweden | 32 | | | | |
| 7025.0 NJ3TT | CW United States | 35 | | | | |
| 7025.3 K1DW | CW United States | 32 | | | | |
| 7025.9 AA3B | CW United States | 38 | | | | |
| 7025.9 AA3X | CW United States | 38 | | | | |
| 7025.9 AA3K | CW United States | 38 | | | | |
| 7026.3 N9FZ | CW United States | 13 | | | | |
| 7026.5 NABW | CW United States | 38 | | | | |
| 7026.7 NABK | CW United States | 37 | | | | |
| 7026.9 WA3AN | CW United States | 37 | | | | |
| 7027.3 K9ZD | CW United States | 43 | | | | |
| 7027.6 KL2A | CW Alaska | 38 | | | | |
| 7027.9 WB6J | CW United States | 41 | | | | |
| 7028.0 MBFJ | CW England | 40 | | | | |
| 7028.6 K4KAI | CW United States | 30 | | | | |
| 7028.6 K4KAI | CW United States | 31 | | | | |
| 7028.9 NAZZ | CW United States | 41 | | | | |
| 7028.9 N4OZ | CW United States | 39 | | | | |
| 7028.9 NAZO | CW United States | 39 | | | | |
| 7028.9 N4ZO | CW United States | 38 | | | | |
| 7029.5 N2YO | CW United States | 29 | | | | |
| 7029.5 T2Y0 | CW Tuvalu | 41 | | | | |
| 7030.1 KR2AA | CW United States | 36 | | | | |
| 7030.3 K0ZR | CW United States | 32 | | | | |
| 7030.3 K0QR | CW United States | 32 | | | | |
| 7030.3 K0QL | CW United States | 47 | | | | |
| 7030.6 K3MM | CW United States | 39 | | | | |

Howdy Ho!



Week 7 - Session 13

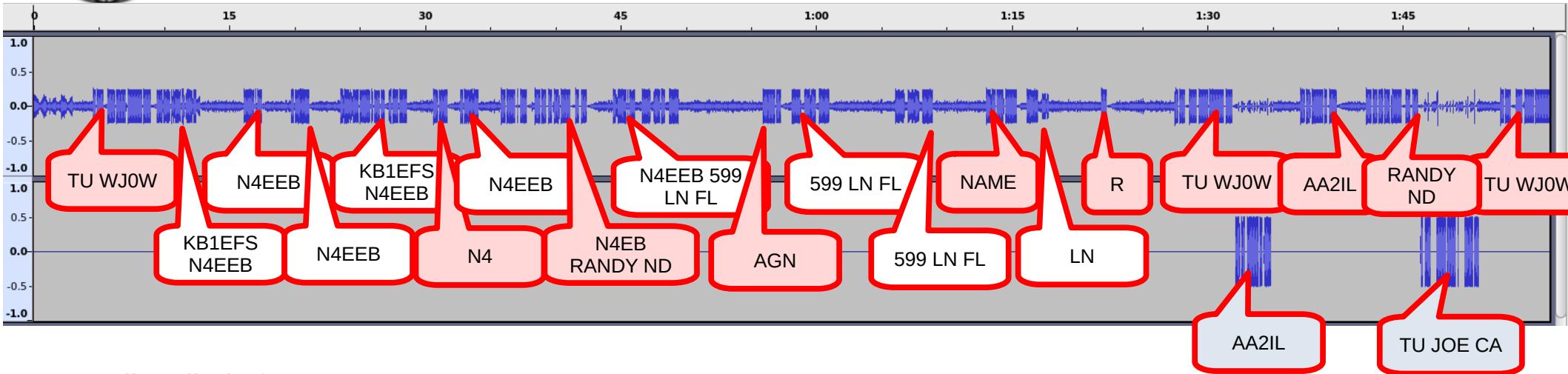
CW Academy

- Go over h/w and on air activities
 - How much fun was that this past weekend?!
- On the air:
 - SC and NC State QPs
 - NAQP RTTY
- A Comment on Speed
- After the contest
- Round Robin Q&A



CW Academy

Fast is NOT Always Faster



- Audio Clip is from Jan. 2023 NAQP – PSE_QRS.mp3
- Running OP is clearly struggling (major kudos for putting ND on the air!)
- Persistent Pouncer with a somewhat difficult call and name only finally slows down after several repeats
 - Other pouncer gave up and moved on
 - “LN” is probably a shortened version of “ELLEN” but just doesn’t work in this context (IMHO)
- Runner never gets call correct so won’t get credit for QSO
- I was able to complete a contact quickly with no repeats simply by tapping on the brakes



Some Notes from Intl DX Contest

CW Academy

- These were some of the best condx in many years
 - 20m was open around the clock
- This contest is difficult for Low Power stations
 - Competing with QRO stations
 - Spend a lot of time trying to break pile-ups
- RST is always 5NN
- Cut numbers for power:
 - I always translate these to their numerical equivalent
 - According to discussion on CW ops email reflector, the log checking software does recognize 4tt, 1oo, K, KW, etc.



After the Big Event

CW Academy

- Take a deep breath
- Write some quick notes on what was good and what to do different/better next time
- Submit summary to 3830scores
- Upload ADIF log to Clublog and LoTW
- Submit CABRILLO log to contest sponsor

analyzer.adventureradio.de





CW Academy

Accuracy is Important!

- Your score is generally the product of the number of QSOs and the number of “multipliers” (one or both may be weighted)
 - To get credit for a QSO, you must copy the call sign **and** exchange correctly
 - Your score tends to increase quadratically the longer you operate but ...
 - Errors tend to reduce your score quadratically as well
- Scoring for ARRL contests is particularly brutal as there is usually an additional penalty for each busted call sign
 - Not in Log (NIL)
 - Incorrectly copied/logged
- The winners of many large contests are often determined by which ops make fewer mistakes
 - Goal: “Aim for a “Golden Log”
- This is not as much of a concern in the practice contests (SST/MST/CWT) since they are not adjudicated but ...
- How you practice will likely be reflected in your performance in an actual contest



CW Academy

IARU HF Log Check Report

2022 IARU HF CHAMPIONSHIP AA2IL

There were 404 calls found.

Your full callsign is = AA2IL

Your ITU zone was 6

Easy exchange: 5NN ZONE

Call sign and/or call history give big clues
as to ITU Zone

CALLSIGN CHECK RESULTS

40CW JI1RFN is a busted call. The correct call is JI1RFB. **QSB?**

You had 1 calls in your log which were not found in the database of good callsigns. All of these were judged to be busted calls and will be removed from your score - along with an **additional penalty of one QSO** per busted Callsign.

EXCHANGE CHECK RESULTS

40CW K2ZW : 8 should be 6

Probably didn't correct pre-fill from call history

100.0% of your non dupe QSOs had their exchanges checked.

There was only one exchange error found. This QSO will be removed from your your score with **no penalty**.



IARU HF LCR (cont.)

CW Academy

CROSS CHECK RESULTS

15CW K4ZW QSO not found in log.

Can't control what other guy does

87.8% of your remaining good QSOs were cross checked.

There was one bad cross check QSO removed.

You had one not-in-log which will be deducted from your score.

There is an **additional penalty of one QSO** for every not-in-log.

DUPE CHECK RESULTS

KA0PQW is a dupe on 40CW at line # 403

There were 404 QSOs checked for dupes.

There was one dupe found. It was **removed with no penalty**.

Error rate = 0.7% (100 X (Busted QSOs / Duped QSO total))

Easy exchange --> fewer mistakes!



Week 7 - Session 14

CW Academy

- Go over h/w and on air activities
- On the air:
 - SC and NC State QSO Parties
 - NAQP RTTY
- DX Cluster and Reverse Beacon Network
- Round Robin Q&A



CW Academy

Spotting Networks

- The DX Cluster refers to websites that list DX stations that other ops have “spotted”
 - Rare and not so rare DX
 - Running stations in a domestic contest
 - dxwatch.com and dxheat.com are my “go to” sites but there are many others
- Reverse Beacon Network (RBN)
 - A world-wide system of SDRs monitoring one or more bands and using automatic decoders
 - CW and RTTY Skimmers
 - You can view data “live” or download and analyze historical data off-line
 - This is an excellent tool for assessing your station’s performance
 - Send CQ <YOUR_CALL> or TEST <YOUR_CALL> a few times to get spotted
 - reversebeacon.net – can also get raw RBN spots in real-time
 - PSK Reporter does something similar for FT4/8 signals → Almost everyone is a spotter/monitor!
- The use of these tools, even once, puts you in the “assisted” category in a contest
- These tools have altered the landscape for chasing DX
 - No longer have to endlessly “spin the big knob” to find DX
 - Generates instant pile-ups



DX Cluster

Ops Manually Enter “Spots”

CW Academy

dxheat.com

| Filters | DX de | Freq | DX | Tags | Comments | UTC | Date | |
|---------|--------|----------|-------------|--------|------------------------------------|--------------------------------------|----------|----------|
| All | W7BOB | 28 180,8 | Spain | EA7KRB | ⌚ ⓘ | 17:53 | 18/10/23 | |
| None | KA3JAW | 29 600,0 | USA | S01AS | FN20JQ<ES> Heard 3x3 4x4 | 17:53 | 18/10/23 | |
| | KI5MFF | 28 495,0 | USA | KC5OUR | ⌚ ⓘ | Valencia Mid School Students calling | 17:52 | 18/10/23 |
| | N4WMB | 28 565,0 | Portugal | CS8ABG | ⌚ ⓘ | | 17:52 | 18/10/23 |
| Sources | LU6YR | 28 074,0 | Germany | DL1RAE | ⌚ ⓘ | FT8 db-17 From FF51 1965 Hz TNX QS | 17:51 | 18/10/23 |
| W3LPL | W7BOB | 28 180,8 | Spain | EA7L | ⌚ ⓘ | | 17:51 | 18/10/23 |
| | NU4N | 14 286,0 | USA | N2PQJ | ⌚ ⓘ | POTA 2147 NY | 17:51 | 18/10/23 |
| | W5AP | 21 315,0 | USA | W8EDU | ⌚ ⓘ | name Adam | 17:51 | 18/10/23 |
| DXCC | WU5E | 28 455,0 | Norway | LA5XO | | | 17:50 | 18/10/23 |
| VALID | NS8BIG | 28 580,0 | Venezuela | J88IH | ⌚ ⓘ | | 17:50 | 18/10/23 |
| OTHER | W0KAL | 14 327,0 | USA | K4DSX | ⌚ ⓘ | | 17:49 | 18/10/23 |
| | PU9FDO | 28 565,0 | Portugal | CS8ABG | ⌚ ⓘ | 59 CQ DX | 17:49 | 18/10/23 |
| Modes | LU6YR | 28 074,0 | Russia | R2BY | FT8 db-14 From FF51 1965 Hz TNX QS | 17:49 | 18/10/23 | |
| CW | W2TAD | 28 074,0 | USA | W1AW/0 | ⌚ ⓘ | FT8 - Nebraska | 17:48 | 18/10/23 |
| PHONE | KE8RRG | 28 387,0 | France | F5NBX | ⌚ ⓘ | | 17:47 | 18/10/23 |
| DIGI | KI6WJ | 28 076,8 | USA | KL7HFI | ⌚ ⓘ | | 17:46 | 18/10/23 |
| | KG8V | 21 270,0 | Netherlands | PA3DRK | ⌚ ⓘ | USB EN82hn ->JO21ol | 17:46 | 18/10/23 |
| | W3LPL | 28 022,0 | Argentina | 3B8HL | | Heard in NC | 17:46 | 18/10/23 |
| Bands | NC1M | 21 289,0 | Slovenia | S51CK | | | 17:45 | 18/10/23 |
| SHF | KI6WJ | 28 076,7 | Spain | EA1A | ⌚ ⓘ | | 17:44 | 18/10/23 |
| UHF | PY2RT | 28 075,7 | Germany | DG7LBB | ⌚ ⓘ | FT8 Sent: -15 Rcvd: -24 | 17:44 | 18/10/23 |
| VHF | W8FJ | 24 891,9 | Turkey | 9J2REK | ⌚ ⓘ | | 17:43 | 18/10/23 |
| 4m | VE2JM | 24 960,0 | China | HB0WR | ⌚ ⓘ | | 17:42 | 18/10/23 |
| | WP4U | 50 313,0 | Europe | NP2X | ⌚ ⓘ | cqing | 17:39 | 18/10/23 |
| | KA3JAW | 29 600,0 | Spain | EA1BXX | ⌚ ⓘ | FN20JQ<ES>IN70DW Corrected Cal | 17:39 | 18/10/23 |
| | W2FTJ | 28 573,0 | Italy | IZ0WEI | ⌚ ⓘ | CDM I* | 17:38 | 18/10/23 |

dxwatchcom

| show/hide my last filters | | | | | rows to show: | 25 <input checked="" type="checkbox"/> |
|---|-------|---------|----------------------------------|--|---------------|--|
| showing spots for DX call: AA2IL,TO8FH,ZD9W | | | | | | |
| send a spot / search spot by callsign | | | | | | |
| de | dx | freq | obs | | time | |
| HB9XCL | TO8FH | 21026.9 | [AF-027] fb signal in HB9 trx | | 1749z | 18 Oct |
| F8AVK | TO8FH | 28421 | [AF-027] Up5 | | 1746z | 18 Oct |
| EA4HCZ | ZD9W | 18140 | 10UP | | 1742z | 18 Oct |
| IK5MEJ | ZD9W | 50000 | pse qsy try on 50 mhz trx | | 1742z | 18 Oct |
| F5MZB | TO8FH | 24896 | [AF-027] QSX 24897.0 UP 1.00 | | 1742z | 18 Oct |
| DF8V | TO8FH | 18105.7 | [AF-027] mci qso qsx 18108,7 | | 1742z | 18 Oct |
| YO9GDN | ZD9W | 18140 | up 5-15 | | 1739z | 18 Oct |
| RA6LO | ZD9W | 18140 | QSX 18140 | | 1737z | 18 Oct |
| EA4TX | TO8FH | 24896 | [AF-027] QSX 24897.48 IOTA AF027 | | 1737z | 18 Oct |
| F8AVK | TO8FH | 28426 | [AF-027] Up5 | | 1734z | 18 Oct |
| F4FGC | ZD9W | 28021.6 | Tnx Yuris 73 up 4 | | 1733z | 18 Oct |
| F8AVK | TO8FH | 28421 | [AF-027] up5 | | 1731z | 18 Oct |
| OK2LI | TO8FH | 7060.5 | [AF-027] FT8/H -14 trn 73! | | 1730z | 18 Oct |
| AA9RR | TO8FH | 21027 | [AF-027] UP 1 | | 1729z | 18 Oct |
| IK8TGH | TO8FH | 21027 | [AF-027] trn 73 iso | | 1728z | 18 Oct |
| DL3HR | TO8FH | 24896 | [AF-027] UP, calling EU | | 1727z | 18 Oct |
| EC1D | TO8FH | 21027 | [AF-027] CW 599 | | 1726z | 18 Oct |
| W3LPL | TO8FH | 24895.9 | [AF-027] Heard in VA | | 1725z | 18 Oct |
| IK8TGH | TO8FH | 24896 | [AF-027] tnx up up | | 1723z | 18 Oct |
| W3LPL | TO8FH | 18105.7 | [AF-027] RTTY Heard in WI | | 1720z | 18 Oct |
| W3LPL | TO8FH | 21026.9 | [AF-027] Heard in PA | | 1720z | 18 Oct |
| EC1D | TO8FH | 18105.7 | [AF-027] RTTY 599 up 4.5 | | 1718z | 18 Oct |
| IV3ZUY | ZD9W | 28021.5 | Up 5 trn qso 73 | | 1718z | 18 Oct |
| EA5JN | TO8FH | 28421.5 | [AF-027] UP 5 EASY TNX | | 1718z | 18 Oct |
| F8AVK | TO8FH | 28421 | [AF-027] up5 | | 1717z | 18 Oct |



Reverse Beacon Network (RBN)

Spots Automagically Generated by Skimmers

CW Academy

reversebeacon.net/main.php?zoom=40.02,-0.43,1.35&rows=100&max_age=1,day&spot_types=1&spotted_call=&hide=distance_km

REVERSE BEACON NETWORK Hosted by www.dxwatch.com SSN: 151 SF: 169 A5 K: 1 DxWatch Callsign Lookup

welcome main dx spots nodes FTP downloads about contact us

630m 160m 80m 60m 40m 30m 20m 17m 15m 12m 10m 6m 4m 2m
ow my psk3t psk63
CQ DX BCN I/B NCDXF

Unfreeze Zoom Max rows: 100 Max age: 1 Days New spots: 100 Show Spotters Advanced Mode CW Speed: Min all Max all Copy URL to Clipboard

| spotter-callsign | | spotted-callsign[spotted-callsign] | | | | | | | | |
|------------------|---------|------------------------------------|---------|------|------|-------|--------|--------------|------|--|
| spotter | spotted | distance mi | freq | mode | type | snr | speed | time | seen | |
| DD5XX | EAT7EGU | 1082 mi | 14051.0 | CW | CQ | 8 dB | 26 wpm | 2033z 06 Jun | now | |
| OG66X | RD3AEY | 754 mi | 7053.3 | CW | CQ | 19 dB | 10 wpm | 2033z 06 Jun | now | |
| DF7QB | EAT7EGU | 1112 mi | 14051.0 | CW | CQ | 6 dB | 25 wpm | 2033z 06 Jun | now | |
| NN3RP | K2MD | 175 mi | 7030.1 | CW | CQ | 2 dB | 23 wpm | 2033z 06 Jun | now | |
| PYTZC | NEAP | 6123 mi | 21023.9 | CW | CQ | 14 dB | 24 wpm | 2033z 06 Jun | now | |
| EA2RCF-4 | 4O4O | 1077 mi | 18083.0 | CW | CQ | 14 dB | 25 wpm | 2033z 06 Jun | now | |
| G4ZFE | EAT7EGU | 1033 mi | 14051.0 | CW | CQ | 9 dB | 26 wpm | 2033z 06 Jun | now | |
| G4ZFE | 4O4O | 1095 mi | 18083.0 | CW | CQ | 16 dB | 24 wpm | 2033z 06 Jun | now | |
| G4HSO | REAP | 1547 mi | 21024.0 | CW | CQ | 32 dB | 24 wpm | 2033z 06 Jun | now | |
| G4HSO | US7QN | 1398 mi | 21030.5 | CW | CQ | 4 dB | 20 wpm | 2033z 06 Jun | now | |
| G4HSO | 4O4O | 1093 mi | 18083.0 | CW | CQ | 11 dB | 24 wpm | 2033z 06 Jun | now | |
| ES2RR | 4O4O | 1192 mi | 18083.0 | CW | CQ | 25 dB | 25 wpm | 2033z 06 Jun | now | |
| LASTPA | 4O4O | 1548 mi | 18083.0 | CW | CQ | 5 dB | 25 wpm | 2033z 06 Jun | now | |
| JN1ILK | REAP | 4598 mi | 21024.0 | CW | CQ | 31 dB | 23 wpm | 2033z 06 Jun | now | |



RBN Real-Time Filters

CW Academy

The screenshot shows a world map with a central cluster of red dots and blue lines radiating from North America towards Europe, Africa, and Asia. Below the map is a table with columns for callsign, spotter, distance, freq, mode, type, snr, speed, time, and seen.

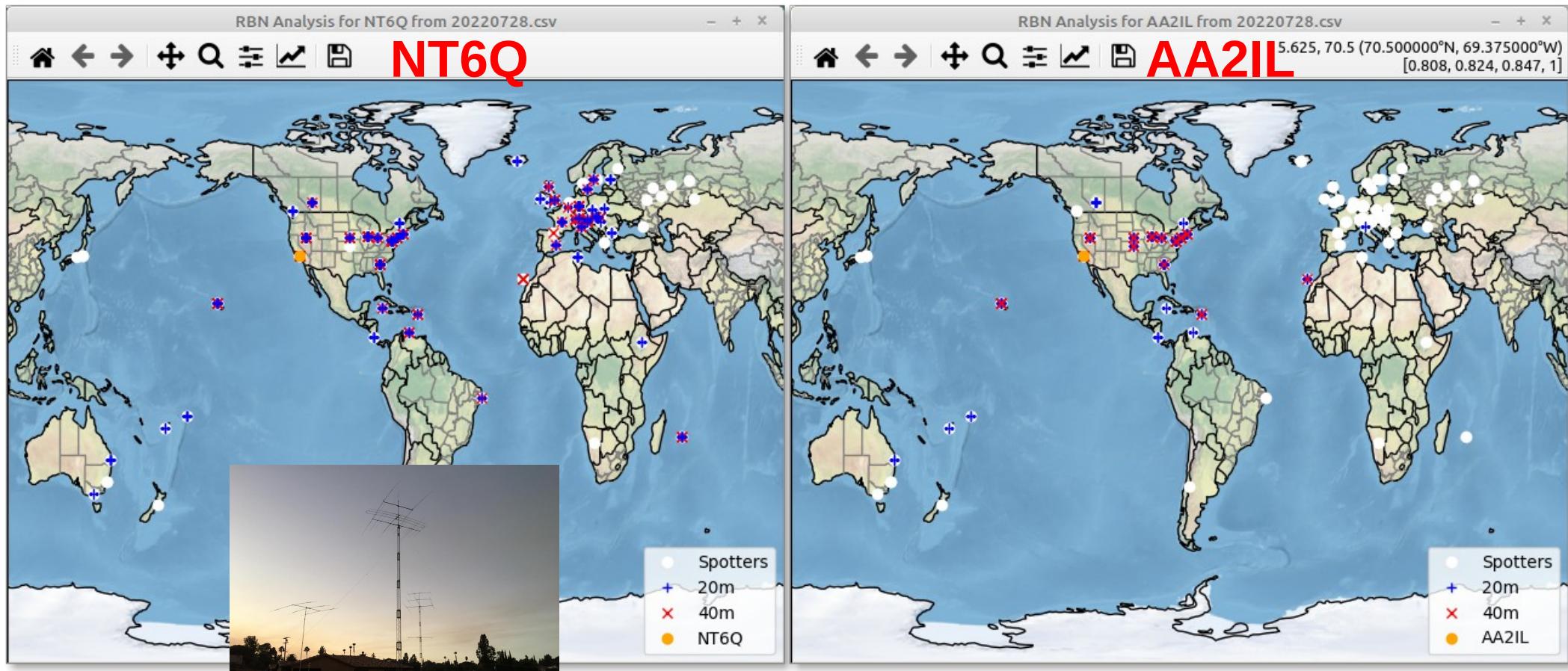
| callsign | spotter-callsign | distance mi | freq | mode | type | snr | speed | time | seen |
|-----------|------------------|-------------|---------|------|------|-------|--------|--------------|-----------------|
| ● spotter | ● spotted | | | | | | | | |
| DR4W | 4L4DX | 1695 mi | 18076.9 | CW | CQ | 18 dB | 25 wpm | 2027z 06 Jun | now |
| + OH6BG | 4L4DX | 1764 mi | 18077.1 | CW | CQ | 26 dB | 25 wpm | 2027z 06 Jun | now |
| BD8CS | 4L4DX | 3424 mi | 18077.0 | CW | CQ | 15 dB | 25 wpm | 2027z 06 Jun | now |
| EZ2RCF-4 | 4L4DX | 2409 mi | 18077.0 | CW | CQ | 5 dB | 25 wpm | 2023z 06 Jun | 98 seconds ago |
| IK4VET | 4L4DX | 1712 mi | 18077.1 | CW | CQ | 16 dB | 24 wpm | 2025z 06 Jun | 102 seconds ago |
| DC6YVZ | 4L4DX | 1724 mi | 18077.0 | CW | CQ | 13 dB | 25 wpm | 2023z 06 Jun | 103 seconds ago |
| VU2CPL | 4L4DX | 2772 mi | 18077.0 | CW | CQ | 15 dB | 25 wpm | 2025z 06 Jun | 109 seconds ago |
| ES2RR | 4L4DX | 1503 mi | 18077.0 | CW | CQ | 24 dB | 25 wpm | 2025z 06 Jun | 110 seconds ago |
| TF3Y | 4L4DX | 3005 mi | 18077.0 | CW | CQ | 12 dB | 25 wpm | 2025z 06 Jun | 111 seconds ago |
| DMSGG | 4L4DX | 1616 mi | 18077.0 | CW | CQ | 18 dB | 25 wpm | 2025z 06 Jun | 113 seconds ago |
| HA8TKS | 4L4DX | 1297 mi | 18077.0 | CW | CQ | 21 dB | 25 wpm | 2025z 06 Jun | 114 seconds ago |
| VR2FUN-77 | 4L4DX | 4678 mi | 18077.3 | CW | CQ | 21 dB | 25 wpm | 2025z 06 Jun | 115 seconds ago |
| JN1ILK | 4L4DX | 4794 mi | 18077.0 | CW | CQ | 11 dB | 25 wpm | 2025z 06 Jun | 115 seconds ago |
| SQ5J | 4L4DX | 1345 mi | 18077.1 | CW | CQ | 14 dB | 25 wpm | 2025z 06 Jun | 116 seconds ago |
| GATE | 4L4DX | 2229 mi | 18077.0 | CW | CQ | 7 dB | 25 wpm | 2025z 06 Jun | 117 seconds ago |



Big Gun vs Little Pistol

CWT 0300-0400 July 28, 2022

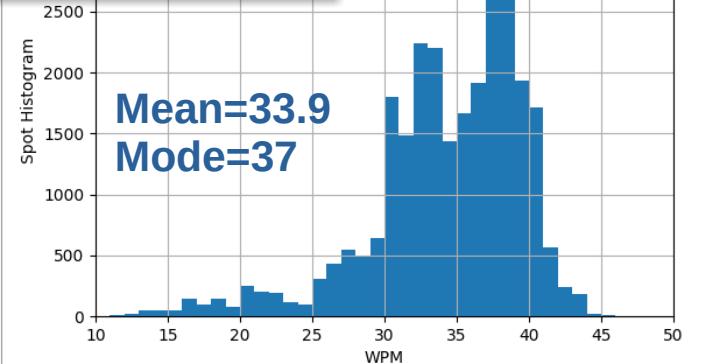
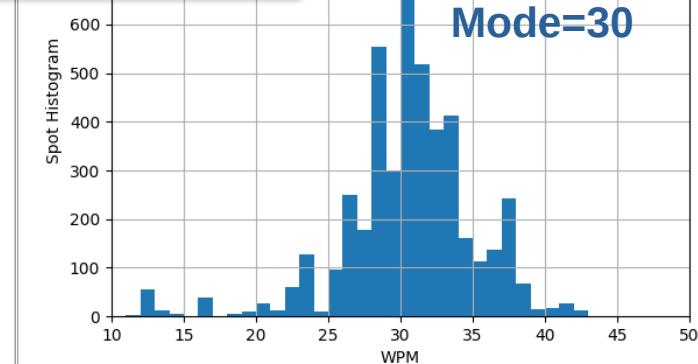
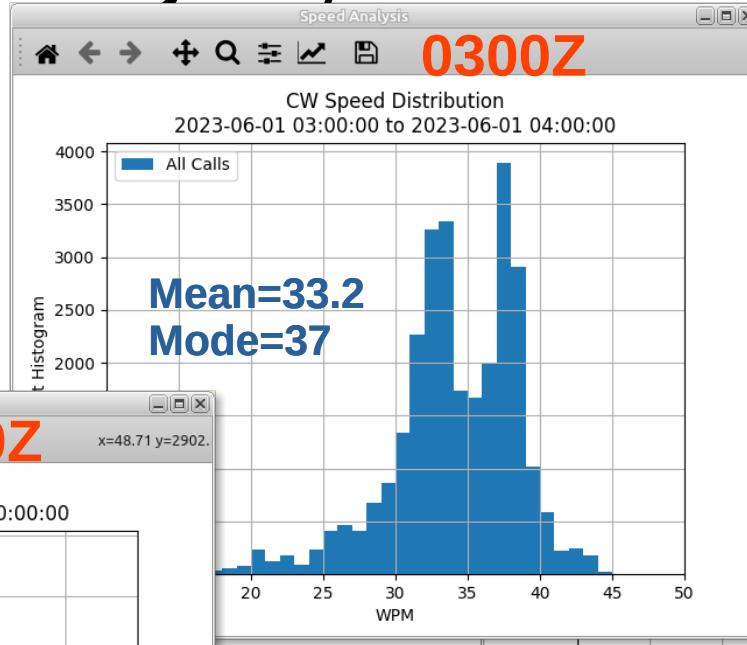
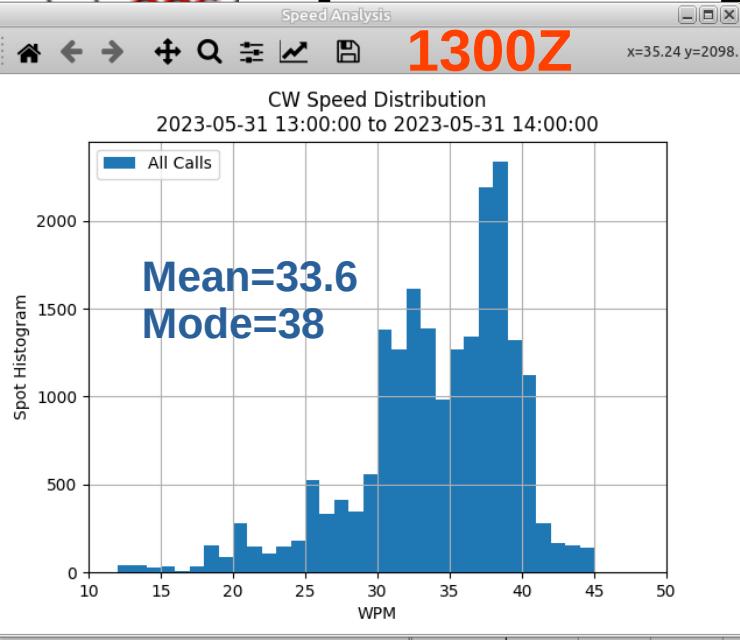
CW Academy





Speed Analysis – May 31, 2023 CWTs

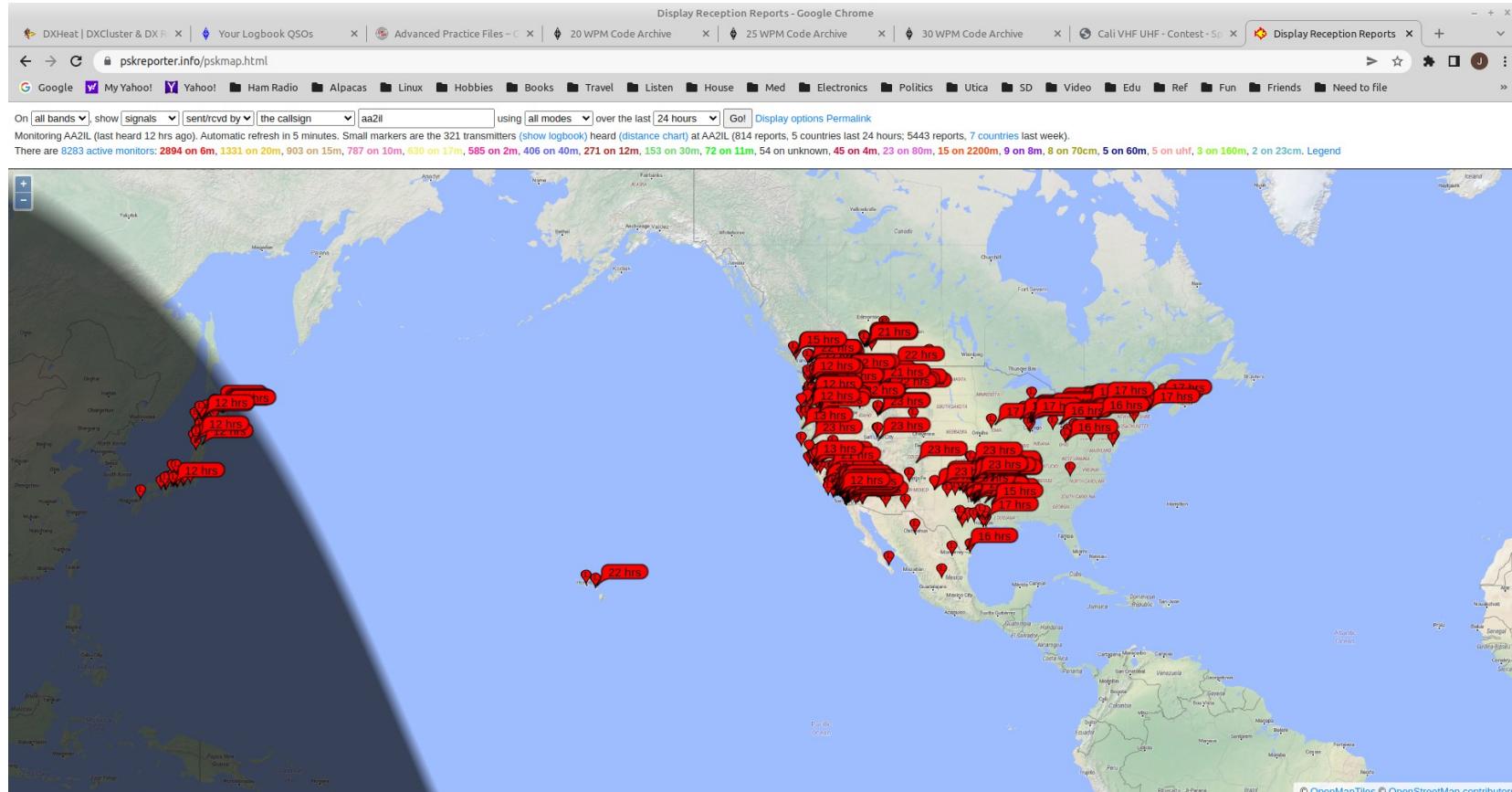
CW Academy





PSK Reporter – Stations Who Heard Me on 6m During the June 2022 VHF Contest

CW Academy





Week 8 - Session 15

CW Academy

- Go over h/w and on air activities
- ARRL International DX – SSB is this weekend
 - Very popular, condx should be great!
 - Look for increased DX activity surrounding the contest
 - Its often easier to chase CW DX during a major phone contest
- CWops Club
- Round Robin Q&A



CWops Membership Requirements

CW Academy

- Demonstrate Proficiency at 25-WPM or higher
 - Easiest way is to make several contacts in the CWTs
 - You can also schedule contacts with current members to gain sponsorship (or call/answer CQ or have a give-back QSO or ...)
- Nomination + 3-sponsors
- You don't need to be perfect!
 - Implicit is the understanding that you will continue to improve as you get more involved with the club activities
- Dues: \$15/yr or \$60 for 5-years or \$125 for life



CWops Activities

CW Academy

- CWTs, CW Open, OTA Give Back, QTX
- CWA - **Please consider becoming a Advisor**
 - You can also be a co-advisor
- Solid Copy - Monthly Newsletter
- E-mail Reflector
- Awards: CWT Participation, ACA, CMA, WAS, DXCC, WAE, WAZ ...
 - Upload your logs to <https://cwops.telegraphy.de/>
 - Post CWT summaries to <https://3830scores.com/>



More Contest DOs and DON'Ts

CW Academy

- Before the contest:
 - Become familiar with the rules (who to work, exchange, scoring, multipliers, log submission deadline)
 - Update and test computer OS and logging software (Also test your rig and antennas)
 - Take a look at the NCJ for hints from top-tier contestants
- After the contest:
 - Upload your summary to 3830scores.com
 - Track your progress
 - Get more visibility for your call sign
 - Credits toward club awards
 - Upload your log to LoTW and Clublog
 - The final courtesy of a QSO is a confirmation (QSL)
 - Submit your log to the contest sponsor
 - Helps with log checking
 - Many sponsors will provide you a log-check report so you can see how accurate you are
- During the contest:
 - Don't send "B4" to a Dupe
 - Just work him again - Its almost always faster
 - He may not have you correctly in his log
 - He may be using an old-school paper log
 - Call your CWA advisors/classmates/friends for extra brownie points!!!



What If You Miss Something?

- Occasionally, you will miss a call sign or part of an exchange:
 - QSB, QRM, QRN, Poor Fist, Fatigue ...
- If you are running, you **must** ask for a repeat if you have any doubts:
 - Call sign: N0? or PM? or 0? or CALL? or ? or “the pregnant pause”
 - Serial: NR?
 - Name: Name?
 - QTH: QTH?
 - Entire Call or Exchange: ? or AGN?
- If you are S&Ping, use your discretion whether to ask for a repeat or just listen to the next QSO
 - How competitive are you?
 - How busy is the runner?
 - Try not to slow the runner or next caller down
 - Don't ask for his call sign unless he hasn't ID'd in several QSOs
 - Be careful with serial numbers – they are not always consecutive!
- In either case, try to be specific what you need
- Perfection is not necessary in an un-scored practice contest but don't get lazy!



CW Academy

Scoring & Classifications

- **YOUR SCORE = QSO POINTS x MULTIPLIERS**
- **Unassisted** – No spotting assistance or multi-signal decoder
- **Assisted** – Use of Spotting Assistance
 - DX Cluster, Reverse Beacon Network, CW Skimmer, WSJT-X ...
- **QRP** – 5-Watts or less
- **Low Power** – 100-Watts or less
- **High Power** – Over 100-Watts
- Single Op, Multi-op, ...



Session 16 – Graduation!!

CW Academy

- Certificates
- Major CW contests throughout the year:
 - NAQP – January and August
 - ARRL International DX CW – February
 - CQ WPX CW – May
 - ARRL Field Day - June
 - IARU HF Championships – July
 - CWops CW Open – September
 - California QSO Party - October
 - ARRL Sweepstakes - November
 - CQ WW CW – November
 - State QPs - February – November
 - ARRL 10m and RAC Winter QP – December
- Final slide deck for class is available at
https://github.com/aa2il/CWA/blob/master/0-CWA_Notes.pdf





My Favorite Ham Websites

- Contesting related:
 - WA7BNM's Contest Calendar: contestcalendar.com
 - WA7BNM's Contest Score Rumors: 3830scores.com
- DX Cluster:
 - DX Heat: www.dx-world.net
 - DX Watch: dxwatch.com
- Activity:
 - Reverse Beacon Network: reversebeacon.net
 - PSK Reporter: pskreporter.info
- Chasing DX:
 - DX World: dx-world.net
 - DX News: dxnews.com
- Propagation:
 - VOCAP: voacap.com
 - DX View: hf.dxview.org
- Just Plain Cool:
 - ADIF to MAP: analyzer.adventureradio.de
- There are many other very good sites



Final Comments

CW Academy

- It has been a genuine pleasure working with each of you
 - You each have made significant progress
 - There is an optional self-evaluation on the CWops website
- Please keep in touch
- Keep on practicing
- Get on the air!
- Please provide feedback to us on this class:
 - Overall format (too much talk, not enough practice?)
 - Topics you would like to see
 - Topics that we should have skipped ...
- If any of you are linux hackers and are interested, I'd like some collaborators on the operating tools I showed you



Additional Material

CW Academy

- More Contesting Info
- Sending
- Morse Code Timing
- A simple iambic keyer/code practice oscillator
- FT8
- My station and software



CW Academy

ARRL Field Day

- Fourth Weekend in June
- One of the most popular operating event all years
 - “Its not a contest” – Logs are not adjudicated
 - RAC Section list as been updated (and a few other rule changes)
- Exchange:
 - No. TRANSMITTERS, CLASS and SECTION

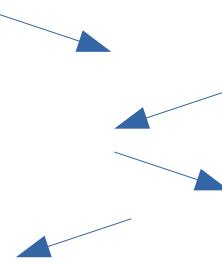
CQ FD AA2IL

N7AUE TU 2E SDG

73 AA2IL

N7AUE

TU 1B NV





CW Academy

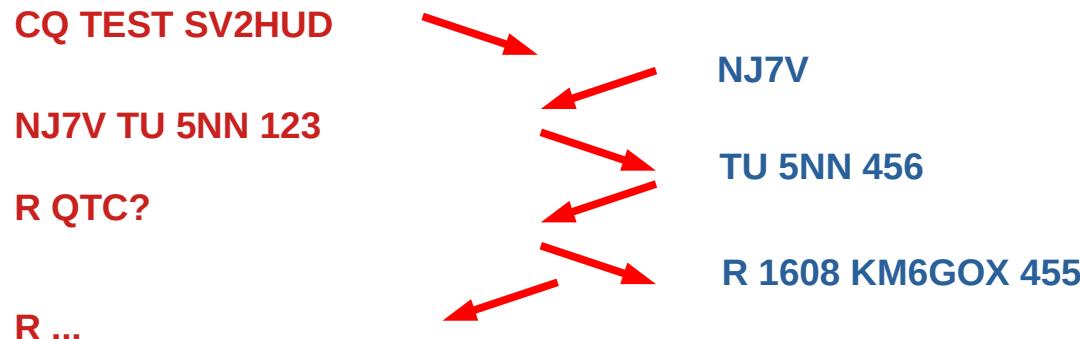
Sprint Contests

- The QSY requirements make these events quite different compared to a typical contest:
 - If you call CQ, you must QSY at least 5-KHz before you can call CQ again
 - If you pounce, you can answer one caller and then you must QSY
- The order of the elements in the exchange indicates who is the CQer and who is the pouncer:
 - **CQ NA AA2IL**
 - **N7AUE**
 - **N7AUE AA2IL 123 JOE CA**
 - **AA2IL 456 JIM NV N7AUE**
 - **TU**
 - **W0WL**
 - **W0WL N7AUE 457 JIM NV**
 - **N7AUE 789 JOE WA W0WL**
 - **TU**
- See <https://www.kkn.net/n6tr/sprint.html> for an in depth look



QTCs

- Some European contests include “QTCs” which add another level of difficulty to the exchange
 - A QTC is info from a previous contact you had in the contest
 - True test of skill since nearly impossible to predict
- Example (Time Call Number)

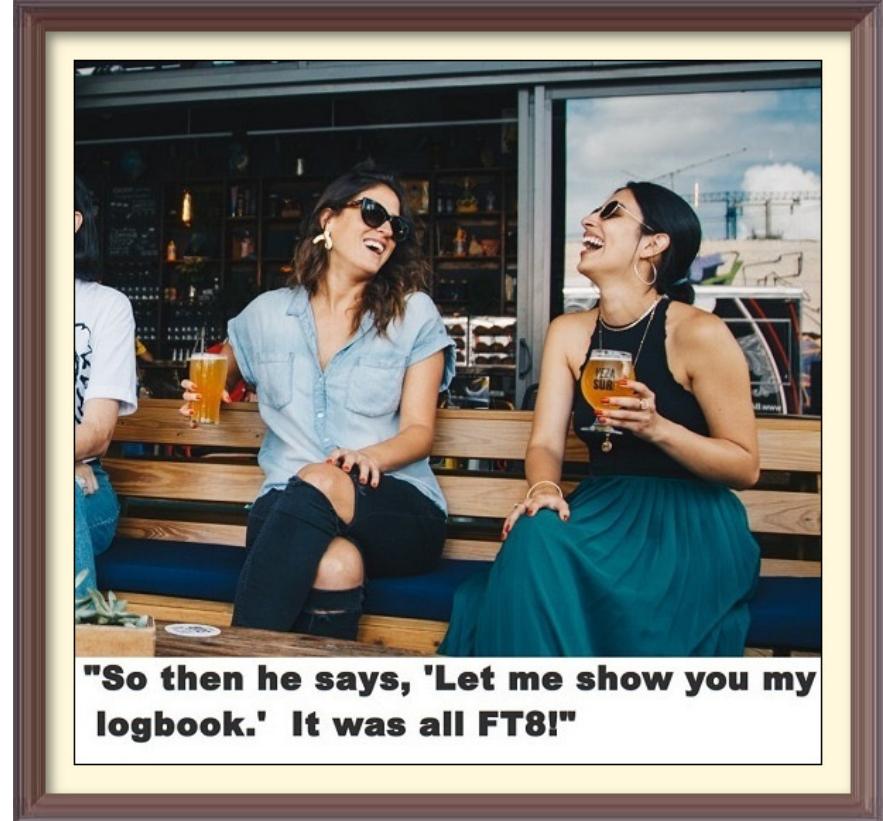


- YL3JD's QTC Trainer: <https://yl3jd.fizioikskile.lv/qtc/>
- YL3JD's Contest Trainer: <https://yl3jd.fizioikskile.lv/fsm/>



The Elephant in the Room

CW Academy



"So then he says, 'Let me show you my logbook.' It was all FT8!"



CW Academy

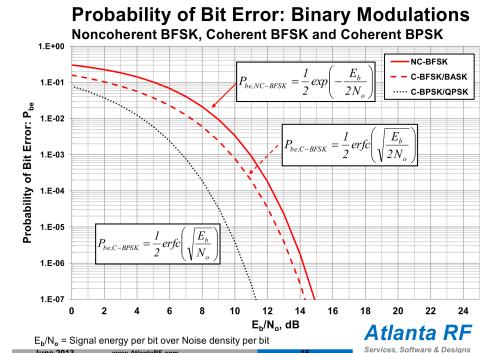
What about FT8?

- There is no question that FT8 is by far the most popular mode in use these days
 - Nearly all DXpeditions include a significant FT8 component in their operating plan
- There is also no denying that this mode stirs up some very heated comments amongst CW devotees.
- On the plus side:
 - The use of error control coding introduces redundancy that improves performance compared to RTTY
 - In an age of ever increasing restrictions (e.g. HOAs) and RF noise, it offers many ops an opportunity for many to still enjoy our great hobby
 - It can provide a gateway to newcomers (who we hope will eventually become bored with FT8 and endeavor to learn CW!)
 - It is possible to enjoy being on the air while doing something else
 - There's always a party to be found on somewhere!



FT8 – The Rest of the Story

- Major Objections include:
 - The existence of “robot” variants of WSJT-X that don’t require any human intervention – not as prevalent as it is made out to be
 - Lack of a conversational capability - JS8CALL is not very popular
 - Dependency on an accurate clock – easy to overcome using a cell-phone or GPS dongle
- IMHO, the WSJT software and operating technique have not kept up with the explosive popularity of this mode
 - Confining a large number of ops into a single voice channel with no standard method to “spread out” results in a “QRM-fest”
- Its sensitivity/capabilities are greatly exaggerated:
 - Referencing the SNR of a signal that only occupies a few Hz of bandwidth to 2.5KHz is questionable:
 - $\text{SNR}_{\text{ft8}} = S / N = [E_b R] / [N_0 B_{\text{ref}}] = E_b/N_0 R/B_{\text{ref}}$
 - E_b = Average Energy per Information bit
 - N_0 = Noise Power Spectral Density (assumed white)
 - R = Information data rate = ~77-bits/15-sec.
 - $R/B_{\text{ref}} = (77/15)/2500 \sim -27 \text{ dB}$
 - $E_b/N_0 = \text{SNR}_{\text{ft8}} + 27 \text{ dB}$ is the standard measure of SNR when evaluating the performance of a digital comm schemes
 - **The myth that FT8 somehow magically digs signals out from well beneath the noise floor and is therefore much more sensitive compared to other modes, including CW, is simply NOT TRUE!**
- The F/H mode is confusing and of dubious value since it reduces the fox’s signal by 6-dB each time he doubles the number of streams
 - Burying this option in an obscure menu doesn’t help – turns out “hounds” don’t need it if they stay above 1-KHz!
 - Signals from the MSHV variant look similar but are not F/H





Why do I Still Use FT8 Occasionally?

CW Academy

- Its radio – it still requires some skill to navigate through propagation and QRM
 - CW is much more satisfying!!!
- Chasing DX
 - You need to be where the action is
 - The behavior in some recent CW DX pile-ups has been a blemish on our great hobby (DQRM, lids, cops). The FT8 pile-ups were much more orderly (not at all perfect!).
- VHF Contesting and EME
 - FT8 is dominant on 6m and JT65 is dominant on EME
- Although exaggerated, the signal reports are real and objective measures (unlike the usual 5NN)
- PSK Reporter immediately shows what bands are open and who's on
- I can still play radio while doing something else



AA2IL Homebrew Software

CW Academy

- Source and some binaries are available at github.com/aa2il
 - Integrated suite of apps
 - Developed under linux but most recently ported to Windoz
 - Windoz binaries also available – see “Releases” on RHSs
 - Very little documentation
 - Would welcome collaboration!
- **pyKeyer**
 - Contest rig control (via flrig) and logging
 - Practice mode for contests and sending
- **bandmap**
 - DX Cluster spots
 - Worked/”Need” tracking
- **wclock** – World clock with gray-line map
- **pySDR**
 - Software Defined Receiver
 - Panadapter
 - Does not work yet on Windoz

The screenshot shows the GitHub repository page for `aa2il/pyKeyer`. The main area displays a list of files and their commit history. On the right side, there's a sidebar with repository statistics and a 'Releases' section. The 'Releases' section is circled in red, showing a single entry for 'pyKeyer v1.0 by AA2IL' with a green 'Latest' badge. Below the releases, there's a note about publishing packages and a 'Languages' section showing Python as the primary language.

Releases 1

pyKeyer v1.0 by AA2IL [Latest] last week

No packages published Publish your first package

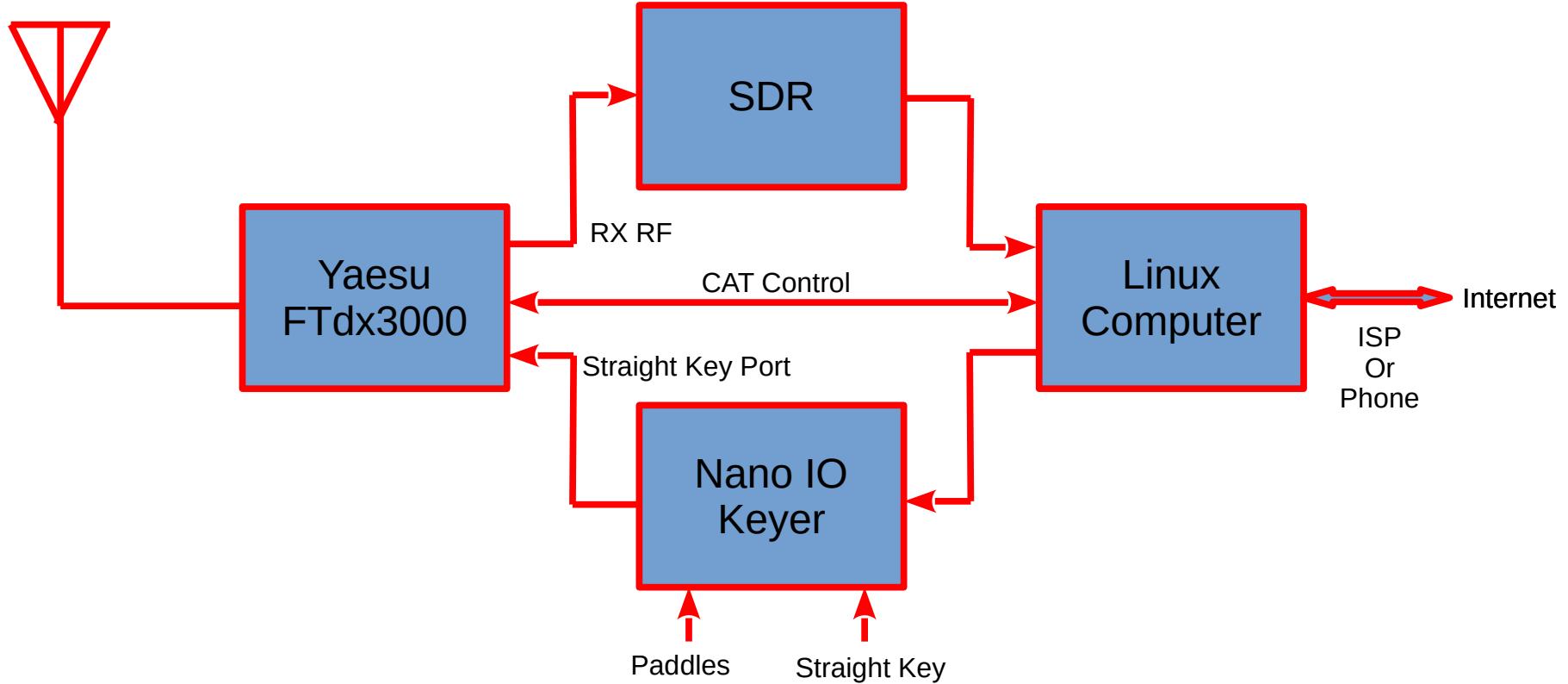
Languages

Python 93.0% Shell 5.6% Other 1.4%



AA2IL HF Station

CW Academy





CW Academy

Other Topics – Next Time?

- SOTA/POTA
- VHF+ and Satellite Contacts
- Other games:
 - Dear Diary – sending practice, what did you do today?
 - Never ending story – each person adds to the story
 - It was sunny today
 - My dog went outside
 - He chased a cat ...
- Log for Old Men – A couple of students were using this one
- Muley had an interesting variation of SST drill where he and I jumped in under other call signs