



Field Day 2025, Ocean Monmouth ARC using call N2MO. Photo by Denis OBrien N2JF



## NEWSLETTER PROMOTING **MORSE CODE**

SUMMER 2026

### **FIELD DAY CLASSES OPEN TO THE PUBLIC**

For the first time, LICW will make its Field Day CW training available to the broader amateur radio community, not only to LICW members.

This is an important step for our club and a meaningful opportunity for LICW to give back.

**ARRL Field Day 2026** takes place on the weekend of June 27–28. The Field Day operating period begins at 1800 UTC Saturday and runs through 2059 UTC Sunday. This year's theme is "Amateur Radio: A National Resource." That theme fits LICW well.

Field Day has always had a special place in the story of LICW. LICW was conceived after Field Day 2017 with a simple idea: help more amateur radio operators learn and enjoy CW so they would be ready for the next Field Day. That original spirit remains part of who we are.

As we approach this year's ARRL Field Day, LICW will offer focused Field Day CW training and practice during the month of June. We will conduct nine

Field Day CW training classes each week, giving participants multiple opportunities to attend.

These sessions will help operators better understand the structure, rhythm, and flow of a Field Day CW contact, including listening, sending, the Field Day exchange, common abbreviations, recovery, and confidence-building in a real operating context.

Our goal is a simple one: *Help more hams enjoy CW on Field Day.*

***These sessions will be open to all amateur radio operators. You do not need to be a member of LICW to attend, and there will be no charge for the training.***

Since many LICW members are also active in local radio clubs, we are asking for your help.

Please reach out to your local club, Field Day team, CW group, or amateur radio friends and encourage them to participate in this project. This training may be especially helpful for operators who are curious about CW, returning to CW after time away, preparing for a first Field Day CW contact, or simply interested in understanding how Field Day CW operation works.

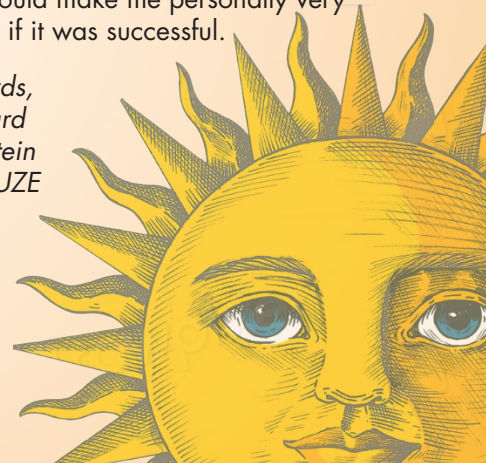
Participants do not need to be advanced CW operators. The goal is not perfection. The goal is preparation, confidence, encouragement, and participation. Whether someone plans to operate, assist, observe, log, or simply learn, they are welcome.

The June Field Day CW training schedule and Zoom access information is available on the LICW website: <https://longislandcwclub.org>

Field Day helped inspire the creation of LICW. Now we have an excellent opportunity to share that spirit beyond our own community.

Thank you for helping us support the broader amateur radio community and this would make me personally very proud if it was successful.

Regards,  
Howard  
Bernstein  
WB2UZE



## IN THIS ISSUE...

Page

### FEATURED ARTICLES:

<a href="#">LICW WINS CLUB OF THE YEAR AWARD – Mike Padron, N1CC</a>	.5
<a href="#">IMAGES OF HAMVENTION, XENIA OH 2026 – Todd Mitchell, NØIP</a>	.6
<a href="#">CW AT 10,000 LEAGUES UNDER THE SEA – Bob Houf, K7ZB</a>	.8
<a href="#">RE DAYTON FLEA MARKET – Howard Bernstein, WB2UZE</a>	.9
<a href="#">IMAGES OF FIELD DAY – Tim Sammons, N6CC</a>	.10
<a href="#">HAWAII POTA – Jim Stinson, NØIPA</a>	.12
<a href="#">LISTENING FORWARD, AND WHY HEAD COPY FEELS LIKE MAGIC – Quentin Caudron, K7DRQ</a>	.14
<a href="#">CW SIGNALS WEB SITE AND FLASH CARD TRAINER – Todd Mitchell, NØIP</a>	.15
<a href="#">BOOT CAMP: AN INTRODUCTION TO CHARACTER FLOW – Tom Weaver, W0FN</a>	.16
<a href="#">WHY I LOVE CW – Ed Cabic, N2EC</a>	.17
<a href="#">THE HIDDEN REASON FOR NOT GETTING ON THE AIR – Jason Oleham, KM4ACK</a>	.18
<a href="#">FIRST CW CONTACT...AND A THANK YOU – Mark Trogon, N4ABX</a>	.18
<a href="#">KEY FRIGHT: TWO PERSPECTIVES – Paul Tanzar, W4PDT and Tommy Judson, N5CTC</a>	.19
<a href="#">FIELD DAY: READY TO DO IT AGAIN! – Nassau Amateur Radio Club</a>	.27
<a href="#">DAYTON FLEA MARKET BOAT ANCHOR WALK THROUGH NOW ON OUR YOUTUBE CHANNEL</a>	.29
<a href="#">A FIRST, QRP EXPERIENCE – Michael F. Welborn, WW4MW</a>	.32
<a href="#">LICW FORUM AT HAMVENTION 2026 NOW ON OUR YOUTUBE CHANNEL</a>	.35
<a href="#">IS MORSE CODE STILL ALIVE? – Dr. Jim Kennedy, K2PHD</a>	.35
<a href="#">MORSE CODE WORLD UPDATE</a>	.37
<a href="#">LICW FIELD DAY TRAINING: A NOTE OF THANKS – Mike Padron, N1CC and Howard Bernstein, WB2UZE</a>	.50

### REGULAR COLUMNS:

<a href="#">LETTER FROM THE EDITOR: Field Day</a>	.3
<a href="#">THE LICW MORSE PRACTICE PAGE – Tom Noller, AB5TN</a>	.4
<a href="#">YL OPEN HOUSE – Anne Dirkman, KC9YLmm</a>	.4
<a href="#">NATIONAL TRAFFIC SYSTEM NET TRAINING – Ed Conway, N2GSL</a>	.20
<a href="#">M32 POCKET MORSERINO – Roger Burkhart, N3GE</a>	.22
<a href="#">KN6EY CODE BUDDY UPDATE – Jasper “Jay” Fox Sr., NK2Y</a>	.23
<a href="#">THE LICW ANTENNA FORUM – Kimball Williams, N8FNC</a>	.24
<a href="#">ESSENTIAL OPERATING SUBJECTS – Cathy Goodrich, W4CMG</a>	.26
<a href="#">LICW-SKCC ASSISTANCE CLASS – Cathy Goodrich, W4CMG</a>	.27
<a href="#">KEYS ON A BUDGET: 3D PRINTED CW PADDLES WORTH YOUR FILAMENT – Richard Rieben, KE4WLE</a>	.28
<a href="#">KIDS CW CLASS NOTES – Bob Cady, W7JNM</a>	.30
<a href="#">WILD ABOUT BUGS: SENDING WITH A BUG – Tom Waits, WA9CW</a>	.34
<a href="#">CLUBMEMBER NOTES</a>	.36
<a href="#">THE DOCTOR IS IN – Greg Algeri, WA1JXR</a>	.37
<a href="#">FIELD DAY PROTOCOLS (START OF COMPREHENSIVE CW PROTOCOLS SECTION)</a>	.38
<a href="#">OUTSIDE THE BOX: Capacitance Raises Frequency / Double-Choked Systems / Cable Labels</a>	
<a href="#">RESOURCES ONLINE</a>	.52



## The Dits and Dahs of Summer: Field Day

As you are reading this, **FIELD DAY** [<https://www.arrl.org/field-day>] looms large on the horizon! According to the ARRL, "Every June, more than 31,000 hams throughout North America set up temporary transmitting stations in public places to demonstrate ham radio's science, skill and service to our communities and our nation. It combines public service, emergency preparedness, community outreach, and technical skills all in a single event. Field Day has been an annual event since 1933, and remains the most popular event in ham radio."

The Field Day weekend is the perfect time for amateurs to get out into the Great Outdoors, to test their readiness for portable ops, road-test their new and not-so-new portable gear and try out the latest in antenna designs. And more than this, it is the perfect time for all involved to get together with their rigs, lawn chairs, coolers and bbqs and enjoy a relaxed weekend of contesting, hobnobbing and just plain fun! This year, Field Day will be held across the continent on June 27 and 28.

I have been a dedicated fan of Field Day for almost ten years now, and every year I get together with the Nassau Amateur Radio Club (Long Island, NY) to set up antennas and tents on a circular field very close to the Atlantic Ocean, where there is almost always a cool breeze to offset the sun beating down on our camp. We set up our tents and generators and usually erect 3 or 4 wire antennas, the most popular of which has been an all-band inverted-L, and are ready to go in plenty of time to meet the 2pm start on Saturday. Our club uses what I think is a great system for experienced ops and newbies alike: each tent/station has a two-person team working the contest, one on the radio and key (or mic), the other logging contacts on a wireless networked laptop using networked logging software. No one person is on the hotseat; if the logger misses a call or



region, the radio op can usually fill that in, and if the radio op is deluged by equipment issues and misses the same items, the logger can usually help out! I have enjoyed numerous sessions this way and made some enduring friendships with teammates in the process.

There seems to be a chronic lack of CW ops during Field Day, which is where US and Canadian members of the LICW Club can shine. We are *NEEDED* during Field Day, especially as stations can garner extra points for CW activities. So get in there, roll up your sleeves, and hit the key!

Two last tips: if you plan to get outside and enjoy Field Day this year, be sure to pack a jacket or sweatshirt for the sudden and frequently unanticipated cold air that nightfall brings. And **DO NOT FAIL** to pack a can of *EFFECTIVE* bug spray/repellant! USE IT and dress in long sleeves and long pants during dusk and at night, those critters can eat you alive! (Ask me how I know...)

\* \* \*

In this Summer Issue of the Long Island CW Club Newsletter, you will find informative articles about Field Day from Tom AB5TN and on "Listening Forward" by Quentin K7DRQ, inspiration from Jim NOIPA with "Hawaiian POTA" and jaw-dropping military history from Bob K7ZB with "CW at 10,000 Leagues Under The Sea". Plus information about the latest model of Morserino from Roger N3GE, printing your own 3D gear with Rich KE4WLE, an expanded section of CW Protocols, and more!

I hope you have a wonderful, enjoyable, CW-filled Summer! ★

73 – Rich Spohn, WB2GXM



Field Day at Baldwin Harbor Park, NARC, Long Island, NY, 2023

## THE LICW MORSE PRACTICE PAGE

– Tom Noller, AB5TN

### ARRL FIELD DAY EXCHANGE PRACTICE

With the ARRL Field Day coming up quickly, it seemed to be a good time to add Field Day exchanges to the MPP. So, after consulting with Ron, KC2PSA, and Stuart, AK4EX, two new exercises have been added to BC3. You will find them under CONTESTS in the LETTER GROUP dropdown list.

The first one in the LESSON list is called ARRL SECTIONS and is a list of all the US and Canadian sections. You will see two options under PRESETS. “Contests Spell” will play the code and then speak each letter. “Contests Words” will play the code and then speak the full name.

The second exercise is called FD EXCHANGES. This one will send a call sign, then a number and letter combination for the number of radios and the ARRL class, and then the ARRL/RAC section. You select “Contest Spell” in the PRESET list to have it speak everything character

by character or “Contest Words” to have it speak the section full name.

Here is an example: AB5TN 1D NTX. This says that ABv5TN is operating with 1 radio and from home (D) located in the North Texas section.

Obviously, you can change the words per minute speed to fit your level.

Here are hyperlinks that will open the MPP with everything set up for you. All you need to do is click on PLAY. The MPP will randomize the exchanges each time you open it.

[ARRL Sections - Spell](#)

[ARRL Sections - Names](#)

[FD Exchanges – Spell](#)

[FD Exchanges - Names](#)

I hope you find these new exercises helpful. Have fun at Field Day. ★

– Tom, AB5TN

## YL OPEN HOUSE

By Anne Dirkman, KC9YL

The ladies of LICW enjoyed another get-together at Bob Evans restaurant on Hamvention Friday, sharing stories of forums attended, eyeball QSOs, equipment purchases, and vendor and flea market finds. Our follow-up Monday night get-together included tales of door prizes won, food truck yummys, POTA bingo fun, license upgrades, and travel adventures.

Join in the fun on Monday evenings in Room C – 9:00 PM Eastern Time and see what the YL4CW Open House is all about. New members or frequent flyers – all YLs are welcome. If you’re looking for equipment recommendations, sending tips, study recommendations....or need a nudge to actually get on the air and are just seeking a bit of moral support – this is the place!

See you on the air!!! ★  
– 73, Anne KC9YL



Field Day at Baldwin Harbor Park, NARC, Long Island, NY, 2023



# LONG ISLAND CW CLUB



Teachers of Morse Code  
longislandcwclub.org

## LICW WINS CLUB OF THE YEAR AWARD, HAMVENTION, XENIA OH



LICW members were out in force at the Dayton Hamvention Awards Banquet, where LICW received the prestigious Club of the Year Award. From left: Rick Bean W8KO, Roland Williams AE6VL, Bob Leichner WO6W, Howard Bernstein WB2UZE, Mike Padron N1CC, Don Zvareck KCØDWZ, Steve Greenbaum N1SG, Chris Rismiller N8PEM, David Dee N2DEE, Chuck Wright K8MDB, and Jack Gerbs WB8SCT.

**The Long Island CW Club** was awarded the prestigious **Club of the Year Award** at the 2026 Dayton Hamvention in Xenia, Ohio.

[This video](#) captures the acceptance of the award by our founder, Howard Bernstein, WB2UZE.

This honor is a testament to the unique culture Howard created, the dedication and determination of our volunteer instructors, moderators, and volunteers, and the commitment of our members who make LICW such a welcoming, supportive, and effective learning community.

We are proud to share this recognition with every member of the LICW family. ★

– Mike Padron, N1CC

## HAMVENTION, XENIA OH 2026



The Long Island CW Club group at Dayton Hamvention, Xenia, OH 2026.



Howard Bernstein, WB2UZE, Co-founder of the Long Island CW Club, addresses the troops.



# HAMVENTION, XENIA OH 2026 (CONTINUED)

Speaker photos by Todd Mitchell, NØIP



Mike Padron, N1CC



Steve Greenbaum, N1SG



Roland Williams, AE6VL



Cathy Goodrich, W4CMG



Todd Mitchell, NØIP, holds the fort at the LICW Booth.



Bob Lechner, WO6W



# CW AT 10,000 LEAGUES UNDER THE SEA

– Bob Houf, K7ZB MT1(SS)DV

Since the earliest days of Radiotelegraphy, a series of Q-Signals were created to provide quick communication of common messages. These are still used today by the military, maritime and civilian radiotelegraph services, including amateur or ham radio operators.

QSL? means 'can you acknowledge receipt'? And QSL 'I can acknowledge receipt'.

Commercial radio stations, shortwave stations and hams have in the past (and some still do) sent a post card called a QSL card to confirm a contact, whether two-way or as a listener. In days gone past shortwave listening was a popular pastime, and SWL (Short Wave Listener) cards were prized possessions, especially for distant (DX) or rare and unique stations.

I became a young ham (WN8KEX) in 1963, and CW was my favorite operating mode right up until I joined the US Navy at age 18 in 1967. After Boot Camp in San Diego, I was trained for the next 18 months in Polaris Electronics and Polaris Missile School. I was then assigned duty on a Polaris missile submarine where I would log my 10,000 leagues (about half of Captain Nemo's 20,000 leagues under the sea) on Cold War patrols.

Now being a Missile Technician and a ham radio operator (WA8KEX) meant I would do double duty (actually triple duty – I also became a Navy SCUBA diver on the submarine) by standing watch in the boat's radio shack.

It happened this way.

I reported on board the USS Alexander Hamilton SSB(N)617 Gold crew in late 1969 as a Missile Technician and as a newbie got

assigned to the diving and rudder planes until the Radioman (RM) Lead Petty Officer discovered we were both hams. On my first patrol he got me off the planes and into Radio ASAP when he learned I could copy code at 35WPM. Although I was an MT, I qualified as Radioman of the Watch with permission from the Executive Officer whose brother had been a ham and that helped.

Since I qualified as a Radioman of the Watch on the USS Alexander Hamilton SSB(N)617 Gold crew, I copied TACAMO Morse code during the Cold War from 1970-72. The deal was that I could stand watches in the radio shack while out at sea on our 75-day patrols in the Mediterranean Sea and above the Arctic Circle. I did that when I was off watch back in the Missile Compartment, which was my normal duty station. My first two patrols were extremely busy getting submarine qualified on the boat and the Missile Compartment watch

stations and occasionally standing watch in Radio.

TACAMO – "Take Charge and Move Out" was created in the early 1960's to ensure if nuclear strikes took out our land-based military communications that a command to fire message could still be transmitted. The system is alive and well today and not classified. Like the Doomsday Machine in 'Dr Strangelove' in the 1960's film noir – if it is kept secret, it is not a deterrent, so you can read about it here: <https://en.wikipedia.org/wiki/TACAMO>

With this as background, I created an "LWL" QSL card (I did this tongue-in-cheek) for Long Wave Listening confirmation of TACAMO CW transmissions sent from a specially modified Hercules C-130 aircraft.

In case of a nuclear attack on the US, the National Command Authority would issue commands to launch retaliatory nuclear strikes from our missile subs through the



Robert E. Houf MT1(SS)DV US Navy Submarine Force



## A LWL QSL\* card to the TACAMO VQ-4 EC-130Q from the USS Alexander Hamilton SSB(N)617 Gold Crew



Ur sigs: RST 569 CW on Freq: ~17KHz  
 Date: 1970-72  
 QTH: Mediterranean Sea/Arctic Ocean  
 WX: Wet  
 OP: RMoW MT1(SS)DV HOUF  
 NOTES: gud cpi es gl  
 \*Long Wave Listener confirmation card

signals sent at [VLF](#) (17KHz) from the aircraft and received by our boats while submerged. ([VLF Video](#))

Of course, we maintained radio silence during patrols, but we could copy VLF when we put out our long trailing floating wire antenna when we were below the surface. We could then pick up the transmissions from the TACAMO EC-130Q's flying in very tight circular patterns just above stall speed, with a 5-mile-long wire trailing behind them which circled down in a helical form just above the sea somewhere out in the Atlantic. An equivalent system was in place in the Pacific for submarines out of Pearl and Guam.

This allowed the VLF signal to travel great distances, and we could then copy it while submerged.

The transmissions were digital with the exception that Morse code was also used back in my day. We would strap on headphones and sit at an IBM Selectric 'mill' and copy 5-letter code groups sent in International Morse code from a Navy RM up in the aircraft. That RM was working in tough conditions because the C-130's had to fly at a steep angle approaching 45 degrees which put them at about 1G and they were sending on a straight key at 15wpm.

Once the messages were received, I handed them off to the RMs and then I left for the Missile Compartment because it meant we were going to have a Weapons System Readiness Test soon – a drill in preparation for the real thing.

Which never came, thank God, or we wouldn't be reading this story now.

The special LWL QSL card I made shows a TACAMO C-130 with the antenna spooling out with its counterpoise – you can just see the drogues at the end of the wires - and the middle photo is of the aircraft internal transmitter gear where the signals were sent.

My submarine is shown in the card with our ship's patch and a pencil sketch of what the radio shack on board an FBM Polaris submarine looked like - the RM with his headphones is sitting at the mill copying TACAMO CW messages.

I put a small QSL data block on the card detailing some of the conditions of a typical message received as if we had been SWL QSLing a ham station.

A ham under the sea copying CW – perhaps Captain Nemo would have been proud... ★

– Bob Houf K7ZB, MT1(SS)DV  
 USS Alexander Hamilton SSB(N)617  
 Gold Crew 1967-73

## RE DAYTON FLEA MARKET

It rained on and off Saturday which is the day we do the live walk through during our 1pm Boat Anchor Forum. Miraculously the rain stopped at 1255pm. We were then able to do the walkthrough live and it was recorded and will be released on our Youtube channel this week. I will let you know when it is up.

Anyway, due to the weather, vendors were scarce and we did not see anything too exceptional. Here are 2 photos that I would like you to see:



*Globe King which I have never seen in person. It weighs almost 300 pounds and the price was more than 3 times each pound, with the rare outboard Globe VFO. I would have bought the VFO but it was not to be sold separately. Later model Globe Kings had the built in VFO. I still have my World Radio Labs paper newsletter advertising flyer, which is on brown sulphate paper and fragile. I used to love looking at all the rigs for sale, some of which I have now. That Globe King was always a marvel to a teenager. Today I know that Rob K6RB of CWops has one in operation. know that Rob K6RB of CWops has one in operation.*



*RT 618 transceiver by MCS: This was a cool looking military rig and heavy too. Does anyone know about this one? There was no price shown.*

73 – Howard WB2UZE

## IMAGES OF FIELD DAY



N6CC operating Field Day CW with the GRC-109, in Stanislaus National Forest above Caples Lake CA.



N6CC during "Vintage Field Day" circa 2012. Running CW with the GRC-109 and a Command Set with 80 and 40 meter systems powered by an AC supply with gas generator. Stanislaus River campsite CA.



## IMAGES OF FIELD DAY (CONTINUED)

All photos courtesy Tim Sammons, N6CC



Field Day 2019 from Crandall Peak, Stanislaus National Forest. Running CW with the 10 watt TRC-77 and friends.



N6CC operating a GRC-109 Special Forces CW set up in Tahoe National Forest for Field Day 2014.

## HAWAII POTA

– Jim Stinson, NOIPA

It was 4°F in Colorado when I left for the airport to fly to the Big Island of Hawaii. My last trip to the tropics put me on Maui, where I activated on the volcano there, Red Hill KH6/MA-001. So, I was very excited to see that the Big Island of Hawaii has not one, but two volcanoes over 13k' high. You wouldn't think of snow on the hills in Hawaii, but those two monsters rise over 30,000 feet from the ocean floor!

Maunakea's (White Mountain) elevation, coupled with their clear skies and lack of light pollution so far away from cities, makes an ideal location for telescopic and radiographic observatories. So, there are 12 observatories with 13 telescopes, including the radio telescopes. Up there, I saw an array of 7 radio telescopes laid out.

The area on the volcanoes is managed by the University of Hawaii. Under their management, Hawaii has prohibited all radio transmission, to include cell phone and Bluetooth beyond the lower base camp facility. There goes any SOTA activation of the Maunakea.

Other SOTA summits on the island are inside of protected park areas, or



on private property, making a SOTA expedition to the Big Island pretty much a no-go.

However, almost the whole island is covered in parks, with a historic trail running down the entire West coast. So, a two-fer for any beach you activate from!

Prepping for the trip, I contacted a local Ham, Heather AH6RF, to get the skinny on the summits. After delivering the bad news for SOTA, she briefed me on the POTA opportunities. She also offered a tour of one of the observatories since SHE WORKS IN ONE! Heather also told me that QRP in Hawaii is not the same as QRP on the mainland. Man, was she right.

My kit for the trip was the trusty KX2, my faithful trapped EFHW, and my HT. I left the collapsible mast home. On site, I added a beach towel, lawn chair, reef-safe sunscreen, and a sixpack (in addition to the built-in sixpack...hidden under a keg).

The first beach park was beautiful white sand, soothing surf, blazing sun, and speedos as far as you could see. No trees where I was, so I broke out the backup antenna, the AX1 vertical. Two hours later I had logged an astounding zero contacts. Well, at least I didn't have to submit a log for this one.

Next was a trip to the East side where the volcano Kilauea is still active. This visit none of the lava fountains that are pretty regular nowadays was happening. Only steam and other vapors. After hiking around the park,





I set up in a corner of the parking lot (it was cold and rainy) and strung out the end-fed. Within 20 minutes I had a half dozen in the log. Piece of cake.

30 minutes later I still had half a dozen contacts in the log.

It wasn't getting any warmer, the rain was building, and I had a hankering for some Hawaiian pizza, so I called it at 7 QSO's. Not a very successful day in the park, but who knew pineapple on pizza was so amazing!

Time to get smarter than the airwaves. Hawaii is skinny on the beach and fat in the middle. Made of volcanic rock and covered with dense vegetation, but surrounded by saltwater. Did I mention the pineapple? I've got to avoid ground effect, get a visual on the horizon and get my signal out over the saltwater. A little timing might help if I can make use of some Gray Line, too.



Next day was sightseeing. They wouldn't let me take my radio on the boat, so I had to suffer through watching whales breach and slap the water and wave at me with their tails. According to HappyWhale.com we were following a female named Uncle Bert. No Hawaiian pizza on board, but they did have Kona Brewing's Longboard Lager.

The tour guide lady pointed out a historic shrine over on the shore that was kind of on its own, not much jungle around it, on the beach, and is a PARK!

The topography to the East was low and a map study showed that between the mountains over the horizon was Southern California. Straight up over the horizon was Alaska and West over the horizon was Japan. My spousal unit loves to watch sunsets on the beach, so I'd

have Gray Line in my favor. A plan was coming together.

I parked the XYL on the beach in a comfy chair facing West; tossed my lead weight and cord high in the banyan tree (I don't know what kind of tree it was. It had branches.) and strung my EFHW down the sandy walk (the beach wasn't in the park, so I had to go back a ways) over a couple knoodling at a bench and tied off to a shack. I popped a can of Kona, and set out the last piece of pineapple pizza.



My first QSO was 3118 miles to Alaska. Then Aldo (NA7DO), 2600 miles to WA. In 20 minutes, I had Washington to Alaska to Japan a whopping 4100 miles away. Those were the short bands.

I waved at the wife and the sunset.

Hoping to catch some locals with NVIS on the long bands I dialed down to 30m and then 40m. No local hams, but I caught 6 more QSO from Washington and California, 2500 miles away. There was some local QRM from a power source clicking and popping on these lower bands. So, I asked senders to send doubles. Between the pops, I got the RSTs and logged them.

In just over 35 minutes, not a record by any stretch, I logged 12 QSOs in a POTA two-fer and saved my Hawaiian vacation. See you next year, Uncle Bert!

*Jim – KH6/NOIPA 72 . . . ★*

# LISTENING FORWARD, AND WHY HEAD COPY FEELS LIKE MAGIC

– Quentin Caudron, PhD, K7DRQ

If you've been head-copying for a while, you've had moments like this: you're a few characters into a word, and before the sender has finished sending it, the word arrives whole in your head. Maybe the sender's signal flickers out for half a second, hidden under QSB, and your brain quietly serves up the next few characters anyway, or you suddenly realize you've been "ahead" of the code for the past few seconds, hearing words form before the dits and dahs have all landed.

It feels mildly miraculous when it happens, but it isn't. We have a name for what your brain is doing, and over the past two decades, neuroscience has built up a fairly serious framework around it. It's called *predictive coding*, and once you see it in your own listening, you can't really unsee it.

## THE BRAIN DOESN'T WAIT

The traditional picture of perception goes bottom-up: sound waves hit your ear, get decoded into characters, assembled into words, and then understood. It's a tidy and intuitive notion, but I think it's mostly wrong.

The picture that's emerged from cognitive neuroscience instead (championed in particular by Karl Friston and Andy Clark<sup>1,2</sup>) is closer to this: your brain is constantly running forward, generating predictions about what it's about to sense. What you experience as "hearing" is mostly your brain confirming or correcting its own forecasts. Sensory input isn't the content of perception; it's a correction signal on the prediction.

The brain doesn't wait for the world to deliver. It guesses ahead, and the world either confirms the guess (in which case you barely notice) or contradicts it (in which case you suddenly do).

## HIERARCHY

The other key piece is that this prediction machinery is layered. Higher levels of cortex make slower, more abstract predictions ("we're discussing antennas") and pass those predictions down to faster, more concrete levels ("the next word is probably *dipole* or *vertical*"), which pass them down again to the level forecasting the next character, which forecasts the next dit or dah. Predictions flow down. Mismatches climb back up.

When you're in a smooth QSO and everything is clicking, those predictions are mostly right. The corrections flowing back up are small, and effort is low. You float along; as we say at LICW, the code is just *coming to you*. When the topic suddenly turns, when the sender misspells a word, when QRM knocks out a character, predictions break down at one level, mismatches climb the layers, the higher levels scramble to revise — and it feels like grasping, confused, effortful.

This is, I think, the cleanest description of what we already know from sitting in front of a key for years. It's also why context matters so much. Context is what the upper layers know, and what they know constrains everything below. It's why "we just had a long discussion about the rig, so when I miss a few characters in the next sentence, I can probably fill them in." It's why a great fist — clean, rhythmic, predictable — is so much easier to copy than a stuttery one. Predictable input is forecastable input, and forecastable input is input that doesn't rock the boat.

## EVIDENCE FOR BRAIN PREDICTION

I want to share one piece of evidence I find particularly validating, because

so many CW ops have felt this. Researchers studying the auditory cortex use what they call *omission paradigms*. They play a regular pattern of sounds (beep beep beep beep) and then, occasionally, silently drop one. There's just nothing where a sound should have been.

Researchers see that the auditory cortex *responds* to the missing sound: not just to the surprising silence around it, but specifically to the sound that wasn't there. Heilbron and Chait,<sup>3</sup> in a 2018 review of predictive coding evidence in audition, point to omission studies as some of the cleanest direct evidence for genuine forward prediction in the auditory system, rather than mere reactive processing.

Think about every QSB-laden QSO you've ever had. You're copying along fine, and then a wave of QSB hits. A moment later, you find yourself confidently writing or saying the character that was hidden behind the static. You weren't guessing; your auditory cortex was already running the forecast. It had a prediction in flight, the incoming signal failed to arrive, and the prediction held. You've been doing experimental neuroscience to yourself for years, and you just didn't know!

## NEUROSCIENCE AND LICW TEACHINGS

If your brain is genuinely predicting forward — if listening is mostly forecast-checking — then a lot of LICW philosophy starts to look less like folklore and more like applied neuroscience.

Here's the bridge that ties it all together. Your brain has a limited budget of attention to spend at any given moment. You can spend most of it on the incoming signal, scrutinizing every dit. You can spend most of it



on the higher-level forecast, riding the topic and the rhythm. You can't max out both at once. Where you spend your attention budget changes everything about how copy feels.

**Alert indifference** is spending the attention budget wisely. Lean too hard on the incoming signal and every transient thump and hiss becomes a crisis your brain has to deal with – you're "grasping at the code." Lean too light and you stop noticing real surprises (we've all zoned out during a QSO...). The leaf-on-a-pond image I've used in a previous newsletter article is just the right balance: light enough to flow with the forecast, alert enough to register meaningful corrections.

**Letting the code come to you** is letting the prediction machinery work. The conscious mind is at its worst when it interferes. When it tries to manually decode each character, it's effectively dumping the entire attention budget on the incoming signal and starving the upper layers. "Don't think, let the subconscious handle it" is almost mechanical advice: get out of the way and let the layers settle. I say this knowing full well that it's easier said than done, but once you're able to get there, you'll notice how much easier copying gets.

**The Recognition and Retention buffers** we talk about in the Intermediate and Advanced curricula are basically those layers showing up in our working language. Recognition is happening at the level forecasting next characters; retention is happening at the level forecasting next words and gist. They reinforce each other. A strong retention buffer feeds top-down predictions into recognition; strong recognition feeds clean input into retention.

**Sending with a great fist** is a gift you give the receiver's predictive machinery. You're delivering a clean, easily-forecastable stream. Their layers lock in fast. Their attention can stay light, and they can copy you fluidly.

## SO WHAT ?

There are two takeaways for me, one practical and one gentler.

**The practical one:** sharper character recognition will always help, but the bigger gains in copy come from time spent in the flow. This is incidentally what Project OverLearn is all about. The forecasts your brain makes in a QSO get built from real CW running through your ears at conversational speed, with all its rhythms, common words, and operator quirks. Letting characters slip past while staying in the stream isn't tolerating failure – it's giving the predictive machinery the conditions it needs to learn. *Subliminal recognition, the Word Discovery mindset*, the whole shift from decoding to knowing – these are what predictive coding looks like from the inside.

**The gentler one:** if some of this lands, please be patient with yourself when copy feels hard. What we're asking the brain to do is genuinely impressive: running forward predictions over a noisy, slow, real-time signal, in a code most of us learned in adulthood, often while QSB and QRM are playing havoc with the input. That it works at all is wonderful. That it eventually feels effortless is, frankly, neuroscience at its most quietly miraculous.

It's not magic. It's just a brain doing what brains do, and a CW op leaning into it.

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## CW SIGNALS WEB SITE AND FLASH CARD TRAINER

**CW Signals** is a web-based resource developed and maintained by LICW instructor Todd Mitchell, NOIP. It offers a **flashcard trainer** as well as **structured courses**, including LICW BC1, BC2, and Kids Tier 1 at the time of this writing. Running strictly in the browser, [cwsignals.com](http://cwsignals.com) does not send any student information to the server (or anywhere else) and is fully COPPA-compliant. The website is built for accessibility across all screen sizes and supports screen readers.

The **flashcard trainer** uses a heat-based spaced repetition system (SRS), the first of its kind in CW instruction, and tracks both mastery of flashcards and response time for each flashcard. Using this data, the trainer also provides customized sending drills that focus on the student's most challenging material.

Lessons in structured courses use voice and CW to teach Morse sounds like the practice tapes of old. Each lesson includes a flashcard exercise that must be mastered before the next lesson is unlocked.

At the time of this writing, [cwsignals.com](http://cwsignals.com) is in alpha and is updated frequently as development continues. New features are in the works, including a lexicon of prosigns, Q-signals, and abbreviations derived from source documents spanning more than a century. ★

73 – Todd NOIP

# BOOT CAMP: AN INTRODUCTION TO CHARACTER FLOW

– Tom Weaver, WOFN

Typical Morse code drills can be thought of as a constant and mentally strenuous effort to stay on a ‘Recognition Train’. Falling off is failure, often leading to looking back and trying harder to recognize the ‘miss’. Maintaining a ‘maximum recognition’ attitude is the primary goal, in other words, traditional code practice with a traditional mindset.

Project OverLearn was created on the realization that Flow practice sessions don’t need permission from recognition success percentages. Waiting for recognition success rates to ‘permit’ flow practice is a great way to delay the acquisition of flow skills – sometimes for years!

*Boot Camp isn’t about staying on the recognition train; it’s about acquiring the Flow Skills needed to stay on the flow train.*

Flow skill improvements yield recognition fluency improvements, not necessarily the other way around. Progress towards Morse code fluency accelerates as our brains learn to process CW in a new way using newly acquired flow skills. Trying to think hard enough and fast enough to keep up with rapid-fire “one letter at a time” processing isn’t how Morse code fluency works.

During Boot Camp, we learn to replace the “recognition perfectionist” mindset with a resilient, relaxed, and an ‘Alert Indifference’ mindset. Flow is prioritized over maximum recognition goals. We learn to be alert for, yet indifferent to, recognition results. We maintain forward momentum and hear every character’s sound, regardless of recognition.

In practical terms, Boot Camp teaches you to normalize *missing*.

Missed characters are how you improve the essential *Instant Flow Recovery (IFR)* skill. *Emotional Equality*: You’ll learn to treat recognition and non-recognition as emotional equals. This attitude is what powers Morse code fluency.

*The Maximum Recognition Paradox*: Prioritizing recognition success tends to slow progress. Listening to faster flow rates is postponed while you try to get every single character! During Boot Camp you learn to *accept*, flow through mistakes, and remain alert and receptive to the next character.

Boot Camp represents a fascinating shift in pedagogy. It essentially describes the “Zen of Morse Code.” By decoupling the emotional sting of “missing” a character from the physical act of listening, Boot Camp focuses on bypassing the cognitive bottleneck that stalls most students.

Traditional practice treats the brain like a serial processor, resulting in crashes when it hits an error. Project OverLearn recognizes the brain can also be a parallel processor that prioritizes the “stream.”

Here is a breakdown of why this Flow-First approach is so effective for skill acquisition:

## Why “Alert Indifference” Works

In neurological terms, the “recognition perfectionist” is stuck in the Prefrontal Cortex—the slow, analytical part of the brain. By the time that part of your brain says, “Aha, that was a ‘K’”, three more characters have flowed by.

Project OverLearn’s Boot Camp appears to push the skill down into the Basal Ganglia and Cerebellum, where pattern recognition becomes reflexive. *By “normalizing missing,” you aren’t just being nice to yourself; you’re preventing the “startle response” that breaks the flow state.*

Key Flow Skills Identified:

- *IFR (Instant Flow Recovery)*: The ability to treat a missed character as “cognitive silence” rather than “failure,” keeping the ear open and receptive for the very next character sound unit.
- *Emotional Equality*: Neutralizing or reducing the dopamine hit of a “win” and the cortisol hit of a “loss” so the nervous system stays regulated and relaxed at conversational character flow speeds.
- *Forward Momentum*: The understanding that Morse code is a river, not a series of stationary rocks. ★

## THE “FLOW VS. RECOGNITION” BREAKDOWN

Feature	Traditional Mindset (Recognition)	Boot Camp Mindset (Flow)
<b>Primary Goal</b>	Maximum Accuracy	Continuous Momentum
<b>Reaction to Error</b>	“Wait, what was that?” (Stalling)	Instant Flow Recovery (IFR)
<b>Mental State</b>	Strenuous, “Hard Thinking”	Alert Indifference
<b>Speed Barrier</b>	Hard ceiling at individual character “thinking” speeds	No ceiling, reflexive pattern recognition, subliminal character processing, comprehension of words and meaning
<b>Emotional Tone</b>	Frustration/ Perfectionism	Emotional Equality



## WHY I LOVE CW

– Ed Cabic, N2EC

I had a friend who I saw this weekend at a hamfest send me a note and he asked me what it is that I love so much about CW. Well, there are a lot of things about it that I love. When I first got my license, when I was 10 years old, I was not a CW fan. It was an obstacle to be surmounted and I learned it in the worst way, which made it unpleasant, so I put it on the shelf for years. I came back to CW as I started getting into activating POTA and found out that CW was a bit of a superpower when it came to that endeavour. By that time I had read a few books on the psychology of Morse code training and realized that much of my youthful distaste for the mode was due to the fact that I had learned to copy through cumbersome translations from a visual model to an auditory one, which was incredibly laborious. I had mostly forgotten the code by this time, so I started to practice it at speed utilizing the Koch methodology.

I was able to internalize the code very quickly at a character speed of 20 WPM, albeit with some Farnsworth to begin, and as that became easier I ramped my character speed up to 40 WPM. This really helped me with automatic character decoding, and allowed me to get to POTA activation quite quickly, but if someone got off the rails, I would be lost since my endurance and ability to copy the unexpected was not where I wanted it to be. So I started focusing on ragchews and extended copy, and gradually built up my ability to operate for long periods of time. I also dropped the pencil and switched entirely to head copy. This was the breakthrough for me and took me rather quickly into higher speeds and accuracy. I struggled to write above 20 WPM, but once I was just listening, I was able to go faster and faster. As I continued, the decode

became increasingly automatic, and I started to relax more and really enjoy the copy. I'm comfortable now up to around 40 WPM and actively working on increasing that speed. My buddy Pete founded the QRQ Crew club which focuses on 35 WPM + CW, and they have an active group of ops always looking for a QRQ sked. Also, I teach Intermediate and Advanced classes at LICW and attend the ADV 2 (25-35 WPM) and ADV 3 (35 WPM +) classes, where we essentially ragchew at speed on Zoom. This has really put the gasoline on the CW fire for me, as it were.

All the while, I started to notice how great CW can be. The operators are top-notch. I've met so many fascinating people both here and abroad who are brilliant and engaging. It is almost counterintuitive – you would think that the conversations you have on SSB would be freer, more easy, more prolonged than those on CW as we're used to just talking. But I find the exact opposite. I think part of it is that when you're having a conversation on CW, you're completely engaged, and usually the other party is as well. While some people can be like the guy in the YouTube video hammering out code while smoking a cigarette, eating breakfast with coffee, and talking to a guy in the room at the same time, when I'm on the air, that's where my focus is locked. No scrolling on my phone, no distractions, just the sound of the code being sent via the ionosphere, directly into my mind. CW is surprisingly intimate. When you talk to someone, they are apart from you. They are where the speaker is, in another physical location. With CW, they're in your head. You're melded together in the sidetone as an active participant, even while you're just listening.

They're inside your head. And that is a unique and quite pleasant method of communication.

I also love the challenges that come with the mode. I have so much fun trying to break a huge pile-up as I'm chasing rare DX (or even an everyday POTA). There is strategy involved – listening, observing, finding where the station is listening and then tail-ending on that frequency, shifting your VFO slightly to shift your pitch just outside the drone of the melee. It can be incredibly satisfying. And the reverse is equally fun. The challenge of decoding a pileup and maintaining rate is exhilarating. The more I do it, the more the "DSP" between my ears becomes attuned to extracting signals from the noise and individual tones in a cacophonous symphony of carriers. I also love that it is almost a universal language. While I enjoy a good ragchew, plenty of QSOs are more minimal, so I get to talk to people who don't need to understand English to communicate with me. Another thing that is great about CW is that while we can invest in super-rigs like the Elecrafts and Flex Radios out there, we can also make a Pixie kit for \$12 off of Amazon and still make the contact. I had a QSO with a friend in Massachusetts with a Cricket kit I built (similar to a pixie but a bit nicer) using its internal PC board straight key and a 9 V battery at an ionosphere incinerating 0.6 Watts. That's pretty magical.

And that's how I tend to feel about CW – it is magical. We take the simplest signal, a single carrier, and we use it to communicate in ways that are more pleasant than the others, with people who are fully engaged in that conversation. It is incredibly satisfying. ★

## THE HIDDEN REASON FOR NOT GETTING ON THE AIR

– Jason Oleham, KM4ACK, reprinted with permission

The other day my wife called out from the garden. She needed a piece of wood cut to a specific length.

We walked over to the shed, grabbed a full length board, unwound the extension cord from its spool, and fired up the saw. A few quick cuts later, the piece was ready. The whole thing took less than ten minutes.

The reason it was such a quick and easy project is simple: we try to remove friction wherever we can. We didn't have to run to the store for lumber. We didn't have to search for an extension cord. Everything we needed was already where it should be.

At this point, you're probably wondering what in the world this has to do with radio.

The same principle applies to getting on the air.

If there's friction between you and operating—especially portable operating—you'll do it less often. Organization is one way to reduce that friction. Keeping your batteries charged is another. If you have to hunt down your rig, coax, or that one USB cable before you can leave the house, suddenly something that should be fun starts to feel like work.

And it's usually not one big obstacle that keeps us from getting on the air—it's a handful of small ones stacked together. The battery needs charging. The coax is in a different bag. The logging tablet isn't where you thought it was. The antenna wire is tangled from the last outing. None of these things are difficult to solve, but when they appear all at once, the effort starts to feel bigger than the reward.

That's when the thought creeps in: "Maybe I'll do it another day."

Reducing friction means making the path to operating as short and simple as possible. Keep your gear in the same place. Store the small items—adapters, cables, and connectors—where you can grab them quickly. Recharge batteries when you get home instead of the night before the next trip. Coil your coax and antenna before putting them away so they're ready for the next outing.

The goal is simple: when the urge to get on the air strikes, you want to be able to grab your gear and head out the door without a second thought. The fewer steps between the idea and the action, the more often you'll find yourself operating.

Do something today that will make it easier to get on the air next time. Future you will be thankful. ★

## FIRST CW CONTACT...AND A THANK YOU

This past week I made my first CW contact as a POTA Hunter and LICW student! With my Xiegu G90, a WWII Navy straight key, and a vertical wire antenna, I made my first contact from my backyard at my home in North Carolina with KOSN who was activating from Lolo National Forest in Montana. To say that I was elated is an understatement! It was not a textbook job of sending on my part as I was a bit nervous. I'm sure my word spacing was a little erratic. However, the joy of this first contact has reinforced my confidence that I can continue to improve my CW sending and copying. I certainly have a lot of work ahead of me, but I'm motivated and look forward to the challenge.

I completed BC2 a few weeks ago but still had not taken the step to make

that first contact. After watching three of my classmates during a Friday evening BC Guided Practice/Intermediate Prep class make actual on-air HF QSOs while the rest of us watched them over Zoom, I knew I had to make my first contact. Shout out to James AE6JG who teaches that class because his effort to have the class see how a real-time HF QSO works between several students and an experienced LICW member was very instructive.

A quick for what it's worth note to BC1 and BC2 students. The BC Sending and BC Guided Practice/Intermediate Prep classes will really improve your copying and sending skills if you can find the time to work those classes in. For context this comes from someone who has struggled with copying and

sending code but has found that I have improved significantly through attending these classes. Also, the structured Activator/Hunter script of a POTA QSO is an ideal way to make your first CW contact successfully. You can learn how to do this by attending a BC Guided Practice/Intermediate Prep class.

Finally, I must say thank you to James AE6JG (BC2 and BC Guided Practice/Intermediate Prep), Ron KC2PSA (BC2 and BC Guided Practice/Intermediate Prep), Michelle KC1UML (BC Sending) and Dave WB0IXW (BC1) for their help and instruction. They have each been very helpful in getting me to this point in my CW journey. ★

– 73  
Mark Trogdon, N4ABX



## KEY FRIGHT: TWO PERSPECTIVES

### “TYPE 2” KEY FRIGHT

Embarking upon learning CW, it won't be long before you are encouraged to try your fledgeling skill live on the air. That is when you will also hear about, and possibly be plagued by, “key fright”. Analogous to voice mode's “mic fright”, it is the overpowering reluctance to apply your newly acquired ability on the air “for real”. Fortunately there is plenty of support at hand. Within LICW and throughout the CW community, there are Elmers and scores of OPS patient and willing to calm your nerves and get you past those first time jitters.

But key fright actually comes in two forms: The stereotypical case above is that of imagining you are not good enough to handle a CW QSO. However, there is another, more insidious form of key fright: that of believing you are not yet good enough. Demonstrative progress and ample encouragement are unconvincing. “It's kind of them to try and encourage me, but I know I'm not ready yet.” Even after somehow managing a first QSO, it's not enough! We pull back again because, hey, it was a fluke, a lucky performance (classic impostor syndrome). This is “Type 2 Key Fright”.

This harsh self judgement is typically not unique to learning CW. It is personal baggage some of us unfortunately bring to learning any challenging skill. Unrealistic expectations driven by perfectionism. We don't so much fear how others might judge us; we know they will judge us as we have prejudged ourselves. It's a pernicious trait that, illogical as it is, is difficult to overcome. It manifests itself as erratic participation, procrastination, a self-fulfilling sense of failing, lacking ability. It steals the rewards of milestones, the satisfaction of achievement, and ultimately the fun we should be having. We eventually manage to break through, given enough incentive and time.

For me, that incentive and time is now. I just turned 80, which has an astonishing impact on all sorts of thoughts and behaviors. I realize I no longer have time to be a perfectionist. It is time to operate, not waste what's left of this solar cycle, or me.

Luckily I met a great code buddy which turned out to be a game changer.

I cannot recommend strenuously enough the value of working with another student. The curriculum presents it as an adjunct to classroom learning, but I've belatedly discovered that experiencing another student's own progress, objective feedback, and repeated trusted encouragement is a powerful counterpoint to perfectionist-driven doubt. It's much harder to believe you aren't ‘good enough’ when there's a friend waiting for your next dit.

It has been said by many others, many times before, in class, on groups.io, Discord, and other channels: “trust the process”. In CW, ‘good enough’ is where the fun begins. I'll let you judge for yourself when we have a QSO.

– Paul Taznar, W4PDT

### KEY FRIGHT OR P.T.S.D.?

First off to lay the ground work: I was born into the ham radio hobby. A half-dozen and family members were hams so I had no choice. This started during WW II.

I never was any more interested than to do enough to be allowed to tag along sometimes. They did interesting things and being a big kid they “let” me do some foot soldier things. You know – dig tower foundation holes, erect tower sections, climb on the roof to attach an insulator for a wire – that sort of “ham” thing.

I must have picked up an aptitude toward doing “radio” in general because when my draft notice arrived in the mail causing me to have to report to take a battery of tests to see where I fit into the military, I found out that was being placed in radio communications.

So after being hustled off to boot camp and completing a grueling indoctrination into the military, I was given a set of orders and told to report to another boot camp at a Navy base in Bainbridge MD, all the way across the continent from San Diego, CA.

This time it was to learn CW communications. That was a part of ham radio I never gravitated toward wanting to learn. So began 6 months of 8 hour days of machine-sent CW, always at a speed slightly higher than the average comprehension level of the class, whew!

My failing was I didn't know how to type along with half of the class. However, there was a bunch that did know how to type and it was a competition between us. I did know the code, but for the first few weeks my fingers found all the space in-between the little round keys on the mill. Fortunately, it typed only uppercase, but had half a dozen extra keys according to the instructor.

The mill keys had squiggly shapes on them that the instructor finally told us were the cyrillic alphabet characters and it had more letters than were on a typical U. S. typewriter keyboard.

The instructor stood at the back of our small class so he could look over our shoulders to see if we were getting it or not. I sat in the back row and he finally figured out I knew the characters but not what key to punch on the mill. So he started a little “personal coaching” as he called it. His nickname for me was “shaky” because my fingers had to sometimes search for the correct key. Of course my anxiety level was very high then, as it is now, whenever using CW.

Note: That high “anxiety level” back in the day was eventually called P.T.S.D. Heard all sorts of encouragement like - “Buckle up Buttercup”, etc.

That's about when my key fright started; however, I overcame it enough to graduate in the top tier of my class. The day he handed out our certificates of completion he called several of us into his office and told us he was looking forward to seeing us again out in the field. He said he would enjoy serving with us.

Anyway, after 60 some odd years, that feeling of anxiety (P.T.S.D.) has just about gone away but I still experience an anxious feeling when trying to communicate with CW.

And just for grins, I need to add that I was never required to copy CW for the military after that class, go figure. That is, except for a very short while on station in Karamursel, Turkey before P.C.S. orders arrived in my mailbox to Scotland. And I did have to send and receive CW several times over the years at different levels to become a Navy Chief by the time I retired.

– Tommy Judson, N5CTC★

# NATIONAL TRAFFIC SYSTEM NET TRAINING

– Ed Conway, N2GSL

## RADIOGRAM PREAMBLE

### What is the Preamble or Header of a Radiogram?

In the last issue we discussed [The Radiogram](#), a format used to convey a formal message. The format has three major sections that make up the radiogram. The *Preamble* or *Header*, *Addressee*, and the *text* which includes the signature. The Preamble can be thought of as the Meta Data for the message. Information identifying the message and information about the message are contained in the fields that are contained in the Preamble.

The preamble is consistent from radiogram to radiogram allowing the receiving station to “know what is coming next”. Let’s review the fields that make up the Preamble. The first field is the “Radiogram **Number**”. The number is assigned by the station

that enters the Radiogram into the National Traffic System (NTS). This station is the “*Originating Station*”. This number means something to the Originating Station. The number is how the Originating Station can find the message when they receive information concerning this message. For example, a new message may well be sent back to the origination station informing the operator when the message was delivered to the addressee.

The **Precedence** assigns an urgency to the message. The levels of urgency are *EMERGENCY*, *PRIORITY*, *WELFARE*, and *ROUTINE*. Most of the messages that are relayed each day throughout the NTS are designated as *ROUTINE*, meaning that the message is handled after all other traffic with higher priority.

Various handling instructions can be designated using **HX** followed by

a letter that corresponds to specific instructions. We will look at the handling instructions later in this article. <https://nts2.arrl.org/>

The **Station of Origin** is the call sign of the ham that puts the message into the system.

The **Check** is the number of word groups in the body of the message. This is used to as a verification the receiving station has copied the same number of word groups as identified by the originating station when the message was created.

The **Place of Origin** is usually the location of the originating station.

The **Time Filed** is the time that the originating station first listed the message in NTS and is optional. When used, it is always in UTC.

The **Date** is the date that the originating station entered the

NUMBER	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE		
TO				THIS RADIO MESSAGE WAS RECEIVED AT					
TELEPHONE NUMBER				AMATEUR STATION		PHONE			
				NAME					
				STREET ADDRESS					
				CITY, STATE, ZIP					
FROM			DATE	TIME	TO			DATE	TIME
REC'D					SENT				
<small>THIS MESSAGE WAS HANDLED FREE OF CHARGE BY A LICENSED AMATEUR RADIO OPERATOR, WHOSE ADDRESS IS SHOWN IN THE BOX AT RIGHT ABOVE. AS SUCH MESSAGES ARE HANDLED SOLELY FOR THE PLEASURE OF OPERATING, NO COMPENSATION CAN BE ACCEPTED BY A "HAM" OPERATOR. A RETURN MESSAGE MAY BE FILED WITH THE "HAM" DELIVERING THIS MESSAGE TO YOU. FURTHER INFORMATION ON AMATEUR RADIO MAY BE OBTAINED FROM ARRL HEADQUARTERS, 225 MAIN STREET, NEWINGTON, CT 06111</small>					<small>THE AMERICAN RADIO RELAY LEAGUE, INC. IS THE NATIONAL MEMBERSHIP SOCIETY OF LICENSED RADIO AMATEURS AND THE PUBLISHER OF QST MAGAZINE. ONE OF ITS FUNCTIONS IS PROMOTION OF PUBLIC SERVICE COMMUNICATION AMONG AMATEUR OPERATORS. TO THAT END, THE LEAGUE HAS ORGANIZED THE NATIONAL TRAFFIC SYSTEM FOR DAILY NATIONWIDE MESSAGE HANDLING.</small>				



message into NTS and must agree with the UTC date. If the message is entered at 8pm local time in New York on Feb 26 then the Date is Feb 27 as it is 0100 UTC on the 27th.

### **What are Handling Instructions?**

The *Handling instructions* allow the originator of the message to ask for outcomes or dictate procedure regarding things like the method of delivery or feedback to the originating station. There is no requirement that handling instructions be used. They are optional and up to the originating station to specify as the station requires. There have been recent updates to the Handling Instructions. Here is a link to the latest from the joint venture between the ARRL and Radio Relay International, [NEW HANDLING INSTRUCTIONS \(HX\) {2025-11-16}](#). Handling instructions always begin with *HX* followed by letter. When transmitting the radiogram via morse code, you always send the *HX* with a letter. So, if you are looking to have the delivery station report date and time of delivery (TOD) to the originating station, you will send *HXC*. Here are the handling instructions from the list:

**HXA** – Delivery by email and/or text message preferred.

**HXB** – Cancel message if not delivered within \_\_\_\_ hours of filing time; service originating station.

**HXC** – Delivering station to report date and time of delivery (TOD) to originating station. If received directly on the air by the addressee, then the addressee is responsible for the reply.

**HXD** – All stations handling this message report to originating station the identity of station from which received, plus date and time. Report identity of station to which relayed, plus date and time, or if delivered report date, time and method of delivery. During disasters or periods of high demand on circuit capacity, avoid using this instruction.

**HXE** – Delivering station gets reply from addressee, originating message back. If received directly on the air by the addressee, then the addressee is responsible for the reply.

**HXF** – Hold delivery until \_\_\_\_ (date).

**HXG** – If postage or other expenses involved, may cancel message and service originating station.

**HXI** – Please deliver as a radiogram-ICS-213 message.

**HXR** – Please confirm that the addressee has read the message and reply to originator. Reserved for Emergency, Priority and Certified precedence messages.

**HXT** – Special traffic test message, ID \_\_\_\_.

The data for the blanks in the instructions is sent following the *HX\_*. For *HFX*, if the message is a birthday greeting and you would like the addressee to receive the message on their birthday, the Handling Instruction sent would be *HXF May 12*.

### **Summing Up**

The Preamble or Header of the Radiogram has not changed much over the decades. It contains information that is used to track messages, identify the origin location/station, and set the precedence for the message. The Check number is critical to determining if the body of the message was relayed correctly.

If you are interested in the National Traffic System, Radiograms, or CW net operation, please join us on Tuesday evening at 7pm in Zoom A for National Traffic System Training. This is the “theory” class and on Monday evenings at 7pm in Zoom E we put the theory to practice by conducting a simulated traffic net using V-band in conjunction with Zoom. ★

– 73, Ed Conway N2GSL

## **CAPACITANCE RAISES FREQUENCY**

Using an inductor to electrically lower the frequency of a short antenna is a common practice. But how many hams realize that inserting a *capacitance* in series in the antenna will *raise* its frequency? In [this video](#), Peter Waters, G3OJV, of Waters & Stanton (UK) describes how to do exactly that. He introduces a break in the center of an endfed antenna where he inserts two wires twisted together to obtain the capacitance (a “gimmick” capacitor). He states that the capacitor has maximum effect where the current is greatest, which in this case is the center of the antenna element. Things become even more interesting when he remarks that a simple switch wired across the break, in parallel with the capacitor, can make the antenna switchable to be resonant on one of two different bands, without adjusting the antenna at all or changing its length (using a switch is best for QRP power levels only). Moreover, the frequencies of the *harmonic* resonances of the antenna remain unaffected by this capacitance. Using this technique, an endfed half-wave that is naturally resonant on 40m, 20m and 10m, for instance, can be made to be resonant on 30m as well, just by using a switch to introduce a capacitor into the middle of the antenna.

The kicker comes later in the video where Peter remarks about replacing the wire capacitor with an air variable capacitor, to make the antenna resonance tunable! ★

73 – The Editor

## M32 POCKET MORSERINO

– Roger Burkhart, N3GE



Are you tired of thumbing your messages? How about emails? Do you hunt and peck?

It is time to take control. After all, you are a cw operator!

Send your texts , emails , messages, etc., directly from your key. Yes! Great way to train your fist. It is also impressive to show others what you can do with cw.

The M32 Pocket Morserino is designed with bluetooth for transferring text to your computer, tablet, or phone. It works. It works very well!

Now , you can strap a key to your thigh and communicate with the world over your phone as you walk down

the street. How cool is that? Well, maybe a little nerdy, but that is how ham operators are wired.

Join us on any Sunday on zoom a at 1000 EDT/1400 utc. Let us demo this unique feature.

Already have a M32? For a white paper on bluetooth, go to <https://longislandcwclub.org/wp-content/uploads/2026/04/M32-BLUETOOTH.pdf>. ★

73, Roger N3GE

*P.S. THIS SUBMITTAL WAS TRANSCRIBED, WITH SOME CORRECTIONS, VIA CW UTILIZING THE M32 POCKET MORSERINO.*

## ON DOUBLE-CHOKED SYSTEMS

Most hams are aware that using a common-mode choke on the antenna end of a coaxial transmission line is good practice. However, in [this video presentation](#), John Portune, W6NBC, makes an interesting point: ANY end of any piece of coax can have currents wrap around from the inside of the shield to the outside, causing common-mode current. And how many ends does a piece of coax have? In this universe, at least, there are always TWO. Not only can common-mode current be generated on the antenna end of a coaxial transmission line, it can be, and is, generated at the TRANSCIVER end as well. John points out that in many cases this current goes unnoticed because many systems are grounded and bonded, but the potential (sorry) for problems caused by common-mode current exists at both ends of your coax.

John makes a very good case for inserting a common-mode choke not only at the junction of the coax and antenna, but at the junction of the coax and transceiver as well. This cleans up reception as well as transmission, as it prevents the outside of the coax from acting as a receive antenna and picking up unwanted RFI. Further, John goes on to say that when you are using a 4:1 or 9:1 balun, it is recommended that you precede the balun with a 1:1 common mode choke.

You can use clip-on or sleeve ferrite beads (John recommends using mix 43 as these are the least expensive) or wrapping your coax around mix-43 toroids which are around \$10 each from most sources. So why not have the cleanest RF environment you can achieve? Deploy those common-mode chokes at both ends of your transmission line and enjoy the hobby that much more! ★

73 – The Editor



## KN6EY CODE BUDDY UPDATE

– Jasper Fox Sr., NK2Y

The KN6EY Memorial code buddy program is going strong! With approximately one hundred LICW members currently signed up, interest in developing and maintaining ongoing code practice is alive and well. Information on the program as well as the roster itself can be found in the LICW dropbox, folder #80. The roster is maintained to help participants find a suitable buddy. That's one of the aspects that I think makes the KN6EY code buddy program unique: it is *not specifically an Elmer program*. The concept is that amateur radio operators with similar cw skills levels meet regularly to practice the craft of sending and receiving code. Ideally this is done over the air, but many of the participants use Zoom or "V" band.

I started to get to know my code buddy, Greg VE3CBN, last year when we discovered that we had both been code buddies with Wayne, KN6EY, when he was the organizer and it was known as the "LICW Code Buddy Program". With our shared experience of knowing Wayne, now sadly a silent key, our friendship developed and I am now honored to call Greg a friend. Since Greg and my schedules are very different, we exchange voice memos with cw messages that we make on them via text once or twice a week. Feedback and discussion is provided via text and the occasional zoom call. We are carrying on the dedicated practice, but also developing the friendship aspect which was what something Wayne demonstrated and emphasized.

I like to check in with roster participants to keep a pulse on how the program is operating, and how it is received by the membership. The

following are some excerpts of replies I recently received:

*"I've been working with Kevin using Zoom, the Vail CW Adapter, straight keys, and the Woozle and Vailmorse servers. We each generate sentences using K7DRQ CW Microtools and take turns sending and copying. It works pretty well. We originally tried over-the-air sending but our signals were not strong enough. He is in California and I'm in Colorado. I've been too busy for LICW classes lately and practicing with a code buddy keeps me motivated to continue".*  
– Bob KE0SDV

*"Last November of 2024, I was trying to decide whether I should pursue getting my extra or learning CW. My buddy Mike K4NYX in Florida convinced me to learn CW. He has been great at keeping me on my toes and not allowing me to become complacent and lazy".* – Scott W3GTR

*"I have had quite a few rag chews at 14/16 wpm with GOUBE, John, in Birmingham. He calls out most every day but we are not always in sync time wise. Propagation also fluctuates a lot".* – JJ F5IJO

*"I was on-the-air while still in BC2, and another classmate reached out to me for weekly rag chews, which we are still doing. I have been hunting POTA and making CW contest contacts and I plan to work a CW station for Field Day for my ham radio club this year. My experience with LICW has been wonderful and I know I have barely scratched the surface of what they have to offer. As far as I'm concerned, I'm just getting started and plan to progress up the ranks and take advantage of the program as much as I can. I will assuredly be a lifelong member!"* – Viki N8VLC

The future of the KN6EY Code Buddy Program looks bright and I hope that it includes YOU. Dropbox folder #80 (Yes I know its way down at the bottom) has all the information to get started and you can even look over the roster without signing up. My sincere hope for the remainder of 2026 and beyond is that more members make the commitment with each other to meaningfully practice CW, hold each other accountable, and as an added bonus make a new friend. ★

– 73 from NY, Jay NK2Y



## THE LICW ANTENNA FORUM

– Kimball Williams, N8FNC

With warmer weather we all look up and wonder what needs to be done to ensure our antennas keep performing well or what should be the 'next steps' to either improve or expand our capabilities in terms of new frequency ranges, or alternative polarizations (horizontal or vertical), or radiation directions and distances.

The Sunspot cycle is moving into a quieter phase, which means that some antennas that worked well when the ionosphere was heavily filled with charged particles from the Sun and the auroras were bright in both hemispheres may be less effective. As that solar charging cycle diminishes, we can expect to develop new skills to compensate, and perhaps new antennas as well. The upside is we are less likely to experience strong coronal mass ejections which completely wipe out most bands, disrupt satellite communication and in extreme instances, burn out miles of power lines. We are entering the 11 year cycle of a 'quieter' Sun, and compensation methods may be needed.

With a less dense ionosphere, satellite communications should be easier, and conversations with Hams aboard the ISS, and with other 'earth bound' Hams using the Cube-sats (*very-long distance repeaters*) and 'moon bounce'. If your experience has only included the HF bands until now, you may become acquainted with an entirely new 'set' of antennas (*Photo below.*)



As with anything new in Amateur Radio, if you move into this different communication area, review the materials in the 'Handbook' and related publications to understand the basics. Then, my personal preference is to try building any new devices (antennas in this case) to 'learn by doing' what are important factors before you purchase something (*Anything!*) 'ready-made'.

Also, note that different operating systems probably will require learning different operating skills, and that will include your CW sending and receiving as well. Those skills you develop in contests and with POTA or SOTA operations will serve you well when needing to complete a QSO while one of the 'birds' is in the visible sky. Also, there is added interest in 'tracking' the satellite as it crosses the sky above you. That added requirement can be met using 'handheld' directional antennas. If your skills include mechanical engineering and electronic control systems, an automatic tracking system is possible. Beyond that, setting up an 'array' of multiple antennas can greatly improve your overall 'system gain'.

Be cautious if you start down that path. It can easily get out of hand. (*Photo at right.*)

A similar case can be made for improving your 'mobile' antenna system to diversify your options. There are documented instances where even something as straightforward as simple mag mount antenna system can get 'out of hand'. (*Photo at right*)

Admitted that this example may be an extreme case but, the next time I pass by the sports car near our home with 7 antennas and associated equipment packed into the back seat, I will stop and take photos and leave

a note for the driver. (They may need professional 'help'.)

### REPAIRS

As CW operators, the HF frequencies are our natural home, and making or modifying our HF antennas, especially if we are seeking observable improvements in performance, may only require a bit of TLC (Tender Loving Care – i.e. maintenance.) or some slight changes or improvements. So, what's the first step?

**Testing:** Since you have been careful to document your experiences with the Reverse Beacon Network, any changes in antenna performance are likely to show up in changes in the RBN reports.

Is the VSWR and feed line loss when measured on your (or your club's) NanoVNA the same?

No changes? Go no further!



**Inspection:** After a winter of wind, cold and moisture, take a close look at antenna support elements to determine if there is any deterioration that can lead to 'antenna on ground' problems.



Check traps, feed points, wires and Coax for wear, and weathering. Be concerned if evidence of water leaks into connectors is present.

**Repair:** The old adage of "If it ain't broke, don't fix it!" should come to mind. Trying to 'fix something that is still in good condition can lead to creating a problem where none existed before. If it must be 'fixed', check in the literature to find out what others have done that worked, and avoid making mistakes where others have already cautioned against falling into a rabbit hole.

## 'NEW ANTENNA'

There are valid reasons for setting up a new antenna system. The old one is now on the ground, is perhaps the most frequent. However, if the old antenna worked well while it was up, why not improve the support system, instead of replacing the entire antenna?

Filling a serious 'gap' in geographical coverage? Adding a new frequency range? Yes, those may make sense.

General engineering discipline directs us to the following: *Research, Analysis, Concept, Prototype, Testing, and Production*. Let's put those into Ham Radio terms, shall we?

- **Research:** Go back to the Radio Amateur's Handbook and learn as much as you can about which antenna will help improve your station's performance.
- **Analysis:** Do the equations support your expected results? How about computer modelling to confirm what you hope to achieve. Will this require additional lightning protection? Where & How will this new antenna be mounted. Will another feed line need to be 'switched' or an additional connection through a 'patch panel'? etc..
- **Concept:** If the new antenna looks good 'on paper', clearly

document all aspects of the design that you are able to predict. Break down the job into sub-tasks, and estimate time and cost for each. Set aside time in your planning calendar for each sub-task, and assess the total time and \$\$\$ for the complete project.

- **Prototype:** Before building the final design, update your computer model, recheck your calculations and assemble a small scale 'model' of the final design. There is nothing like holding a scale replica of 'the real thing' to help appreciate what the full-scale device will look like. (One of my acquaintances builds antennas for the Military and uses working scale models to verify actual performance. Test a 1/10 scale model at 10X the original design frequency and measure the results.)
- **Testing:** Your actual, full size, antenna is now a reality. You have verified its VSWR and confirmed its actual 'range' using the RBN and through QSO's with several representative stations and it is doing all you had hoped for. (*We won't discuss it if it doesn't work.*) So, what next?
- **Production:** With a successful result, document your results, write up the 'story' of how you went from the 'gleam in your eye' to the antenna you hoped for. Present your experience on the LICW Antenna Forum, with lots of your documentation, including photographs at each stage, and consider writing an article for the LICW newsletter!

**Oops!** Lets go back to that earlier statement " (*We won't discuss it if it doesn't work.*)..". Actually that would be a great time to bring your experience to the LICW Antenna Forum and discover who else had the same experience and 'lived to tell the tale'.

One of the easiest things in Amateur Radio to build is a wire antenna,

and it is also one of the easiest to modify to find out just what a change (radiating element, counterpoise, ground connection or radial, height above ground, polarization (vertical or horizontal), azimuth orientation (N, NW, W, SW, S, SE, E, NE) of the main lobe. All can be achieved with minimal time and cost. When careful measurements and record keeping accompany each experiment, an amazing amount of information about antenna performance and its variables can be gleaned.

This learning process can also lead to other benefits. Does one or more of the changes in the antenna affect the background noise? Does that suggest where the interference may originate? Is it something you can work on, or will it require 'professional' help?

*(Note to self: Next LICW Newsletter article should discuss finding and fixing RFI.)*

If nothing you do seems to affect your radiation pattern shown in the RBN in one direction, it is possible that the mountain in that direction might be blocking some of your direct signal? Please do not request that the government 'loan' you a nuclear device to remove the impediment.

Some things in life may require 'agonizing re-appraisals' to quote Loudon Wainwright III. This may be time to invest in more portable equipment and easy to set up and take down and pack antennas and learn more about POTA and SOTA operation! Also consider the wonderful benefits of fresh air and exercise as you carry your equipment to nearby parks and visit friends who live 'in high places'.

*The LICW POTA Forum is in ZOOM\_A at: 11AM EST on Saturdays and in recordings are in Dropbox #17. The LICW Antenna Forum is in ZOOM\_A at: 11AM EST on Sundays and recordings are in Dropbox #22. – 30 ★*

## ESSENTIAL OPERATING SUBJECTS

– Cathy Goodrich, W4CMG

**Tuesdays with Anthony Luscre, K8ZT** – going on Summer Break after the Field Day Special Classes

**Monday evenings and Thursday mornings with Cathy Goodrich, W4CMG**

You're just getting started with CW or know your characters and feel ready to get on the air. Or, you might have been "around" for a while but need a little boost to get your confidence to get on the air! A great number of our Long Island CW Club classes focus on sending and receiving. *Essential Operating Subjects* is a bit different because we *DON'T* Send or Receive in these sessions.

Looking at the LICW Calendar, you might think there is not much taking place, since there may be some instructors in evening sessions are on "Summer Break". No worries! The Tuesday evening (NA) sessions with Anthony K8ZT will be on summer break from June 23 and will resume his Tuesday evening *Essential Operating Subjects* classes in September. The Monday evening (9 p.m. EDT) and Thursday morning (10 a.m. EDT) sessions (duplicate content for each "pair" of sessions) with Cathy W4CMG will continue, with a possible week break due to scheduled travel. Timing will be announced via the Long Island CW Club groups.io in advance of the cancelled sessions.

Each week until Field Day, Anthony and Cathy will be providing information for Field Day 2026, including

- Field Day Update – information on the event and planning your operations
- Interfacing Your Radio & Computer for Field Day, General

Logging, Contesting and Sending CW

- Field Day Final Prep & Setting up your logging software

Perhaps you have some weeks when you can't attend – no worries! Dropping in for a specific topic is fine – and you might think about becoming a "regular" in the sessions. There are some things you can do during the summer break, even if you can't make it to class! First, Anthony has a fantastic collection of recordings and presentations available to catch up on content offered in previous classes through his document, posted at [tiny.cc/joynotes](https://tiny.cc/joynotes). Both classes also have prior content posted in the LICW Dropbox folder 66.

*Essential Operating Subjects, Morning Edition*, is scheduled each Thursday at 10:00 a.m. EDT (1500 UTC), The Monday night sessions take place in Zoom A at 9 p.m. EDT. Duplicate content, same instructor (Cathy W4CMG), so you only need to attend one!

What are the "Essential Operating Subjects" about, anyway, since there is no code sent or received during these sessions (most of the time)?

**Anthony Luscre, K8ZT**, takes you through the "Joy of Operating" with presentations and notes from each session, and some detailed documentation that will guide you through your CW Journey. Everything from Beginners topics, Station Setup, Operating and QSL-ing, through to more advanced topics and specialty tracks (Portable Operations, QRP, Youth, etc.) are covered in his Tuesday Night Classes. Anthony has an amazing website, and a "library" of resources ([tiny.cc/joynotes](https://tiny.cc/joynotes)) that can be accessed to

review the materials he has created or referenced in his classes.

**Cathy Goodrich, W4CMG** hosts an interactive session at the beginning of each class, then dives into the topic for the week. (*Don't worry, we don't make you send or copy – so stop by even if you are just getting started.*) Topics are posted in the Long Island CW Club groups.io before the weekly session, so you will know if it is something you are interested in learning more.

Not sure of what to send when you get on the air for your first (or 1000th) QSO, wondering what tools will help with sending and receiving CW, or figuring out how to find other ops on the air with similar interests, or just plain trying to find a frequency that is NOT occupied during a contest? *Essential Operating Subjects* will help you to navigate through some of the processes, tools and websites to pull it all together!

The classes start with the question: "What have you done over the past week (or longer) toward your goals, fun radio stuff, cool QSOs, etc.?" *THEN* we dive into the topic for the week. Summer topics will focus on getting over "finger fright" to get on the air, CW Protocols, and some tips and tools to help along the way. Topics that will carry over into the "regular" sessions starting in the fall generally involve live demos of a tool (e.g. *Morse Code Ninja, N1MM Logger, CW Club RBN Spotter, SKCC tools...*). Weekly recordings start when we dive into the topic of the week, so you have the opportunity to talk and ask questions before and after the scheduled topics without being recorded, leaving a bit of "comfort zone" for you to ask questions.



**CAUTION:** Many of our topics come from our students who asked questions about them, and the class often dives into a topic, which leads to a very interactive discussion about the experiences of those in the class. We may move some of the content to the following session. The pace is driven by the questions and comments from the participants, with the thought that if someone asked a question, there are probably a couple others in the “room” with the same questions. Recordings from the sessions are posted in the Long Island CW Club Dropbox in Folder 66.

**THOUGHT FOR THE DAY – EVERY DAY - “GET YOUR DAILY CW VITAMIN”!**

Anthony K8ZT and Cathy W4CMG will be doing tag-team articles and welcome your feedback. Remember – your request on a topic may be included in one (or both) of our sessions, so be sure to check the groups.io to see when it will be covered! ★

– 73 de Cathy W4CMG

## FIELD DAY: READY TO DO IT AGAIN!



The members of the Nassau Amateur Radio Club are ready and able to tackle Field Day 2026!. ★

Shown: NARC at Field Day 2025, Baldwin Harbor, Long Island, NY. Photo by Ed Conway, N2GSL

## LICW-SKCC ASSISTANCE CLASS

– Cathy Goodrich, W4CMG

Long Island CW Club (LICW) and Straight Key Century Club (SKCC) – a perfect community partnership for new and not-so-new CW enthusiasts to learn CW, get on the air, and experience a wealth of support from members of BOTH clubs!

Long Island CW Club has a great opportunity for our members to learn about the tools offered by the Straight Key Century Club (SKCC), the LICW-SKCC Assistance Class on Wednesdays at 12:00 EST in Zoom B.

This SKCC class is facilitated by SKCC Board members and long-term SKCC members (either in years, experience, or both!) so you get the benefit of working with ops who have been through the experiences of a new CW operator, and who are now regularly on the air.

During the LICW-SKCC Assistance Class on Wednesday at noon (EST) sessions in Zoom B, you can bring specific “how-to” questions about the SKCC activities, awards, support materials, and tools (SKED Page, Logger, Skimmer). Are you brand new to CW and/or SKCC and don’t even know what to ask? That’s OK, because we can walk through the process of signing up for free SKCC membership, and give some live demonstrations of our tools, as well as

some basic tips to make your on-the-air experience great!

The SKCC Logger has undergone a major upgrade, so this is also your chance to ask questions, or get a walk-through of new and enhanced features of the tool.

If the LICW session days and times don’t work for you, SKCC is offering an “Introduction to SKCC Forum”, open to all SKCC members, including the many LICW Members who are members of both clubs, and want to know more about SKCC, typically on the first Friday of each month at 1500 UTC (10:00 AM EST) or the following Sunday at 1800 UTC (1:00 PM EST). We cover the SKCC Handbook, basic tools, and have additional Bonus Topics that change monthly, so watch on the respective groups.io for info. Watch for the dates (some changes due to holidays and/or travel) in the SKCC groups.io, on the SKED page, or email Cathy W4CMG for more information. **NOTE: REGISTRATION IS REQUIRED** since virtual seats are limited. For more details and registration, contact Cathy, W4CMG at w4cmg.skccintro@gmail.com.

See you in class – AND CU on the Bands! ★

– 73 de Cathy W4CMG

# KEYS ON A BUDGET: 3D PRINTED MORSE CODE PADDLES WORTH YOUR FILAMENT

– Richard Rieben, KE4WLE, Amateur Extra

If you've been operating CW for any length of time, you already know that a quality iambic paddle can set you back anywhere from \$80 to well north of \$300. That's a tough pill to swallow — especially for newer operators still finding their sending style, or seasoned ops who want a dedicated field key without risking their good gear on an activation. That's where 3D printing changes the game.

Over the past year or so, I've designed, printed, assembled, and actually operated on the air with more than half a dozen different 3D-printed paddle designs. Some impressed me. Some humbled me. All of them cost a fraction of a commercial key. Here's what I found.

## WHY 3D PRINTED?

The 3D printing community has been quietly developing some surprisingly capable CW keys. Designs are shared freely on platforms like Printables and Thingiverse, most hardware kits cost under \$10, and the total investment for a functional iambic paddle can be \$15–\$25 depending on what you already have in the shack. For POTA activators and portable operators in particular, they're nearly ideal: lightweight, replaceable, and guilt-free to toss in a field bag.

The catch? Build quality varies with your printer's tuning, and not every design will suit every hand. That's why I built and used all of these myself before writing a word about them.

## THE PADDLES I'VE TESTED

Here's a quick rundown of the six designs I've put on the air, each with honest pros and cons from field experience:

- **K6ARK Classic Paddle** — Pros: Easy to print, minimal hardware, solid accessory ecosystem, available in both male and female jack configurations. Cons: Small form factor, snap-fit parts demand good dimensional accuracy from your printer, limited adjustability.
- **K6ARK Pico Paddle** — Pros: Ultra-compact and lightweight, closely mimics the feel of a Palm Pico, includes Allen wrench storage and magnetic base. Cons: Requires supports during printing, the small size adds build complexity and may frustrate operators with larger hands.
- **K6ARK Single Lever (Cootie Key)** — Pros: Very easy to print and assemble, same minimal hardware as the other K6ARK designs, great for cootie/bug-style sending. Cons: No magnetic base, limited accessory options.
- **KM4CFT Iambic CW Paddle** — Pros: Larger and more comfortable to hold, good adjustability, no tiny fiddly parts, cover and leg plate accessories available. Cons: Feels a bit light in the hand, more involved build process, no Allen key storage.
- **K8CES Zippy Paddle** — Pros: Noticeably heavier and more solid-feeling, magnetic return, bearing pivots, magnetic base — closest to a commercial key

feel. Cons: The most complex build of the bunch, M2-sized parts throughout, requires a 0.9mm Allen wrench you probably don't own.

- **Ham Radio Duo Morse Code Paddle Kit** — Pros: Excellent balance of size and usability, magnetic return comes pre-installed, easy build process, light crisp touch. Cons: That same light touch won't suit everyone, limited adjustability.

## MY RECOMMENDATION FOR GETTING STARTED

If you're new to 3D-printed keys and want one design to start with, print the K6ARK Classic. It's the most forgiving to build, the accessory ecosystem is the most developed of any design here, and it genuinely works. I've made hundreds of QSOs with mine — including POTA activities at home and abroad. Find it at [printables.com/model/332611](https://printables.com/model/332611).

If you want to step it up a notch and your printer is well-tuned, the K8CES Zippy Paddle delivers a feel that will genuinely surprise you for a printed key. Budget extra time for the build, track down the right hardware, and you'll have something you'll reach for regularly.

## POPULAR MODS & ACCESSORIES

Half the fun of this community is the remix culture. Some popular enhancements worth knowing about:

- **KM4CFT with Bearings & Magnetic Return** — adds ball-bearing pivots and magnetic



return to the KM4CFT design.  
([printables.com/model/854669](https://printables.com/model/854669))

- **K7AOZ Magnetic Base Mod** — drop-in magnetic base upgrade for the K6ARK Classic. ([printables.com/model/1664161](https://printables.com/model/1664161))
- **Leg Strap Base Plates** — multiple designs for both the K6ARK Classic and Pico Paddle; ideal for SOTA/POTA activations. ([printables.com/model/336439](https://printables.com/model/336439))
- **K6ARK Carry Case** — doubles as a holder/stand, prints in two pieces. ([printables.com/model/632122](https://printables.com/model/632122))
- **VE7ZAX Magnetic Return Mod** — adds magnetic return action to the standard K6ARK design. ([printables.com/model/1571454](https://printables.com/model/1571454))



The K6ARK Classic Paddle — the author's go-to recommendation for getting started.

## FINAL THOUGHTS

Printed keys aren't going to replace a Begali anytime soon — but they don't have to. What they offer is accessibility. A newer CW operator can get a functional iambic paddle in their hands for the cost of a few spools of filament and a handful of hardware. A POTA chaser can leave the good key at home and still make solid contacts from the field.

If you have a 3D printer or you know a member who does, this is a great project to share. There's something deeply satisfying about making a first QSO on a key you printed yourself. I highly recommend giving it a try. ★

— 73, Rich KE4WLE, OH - #4504i



The K8CES Zippy Paddle features bearing pivots and magnetic return — a more involved build, but the closest to a commercial key feel.

## DAYTON FLEA MARKET BOAT ANCHOR WALK THROUGH NOW ON OUR YOUTUBE CHANNEL

Here is the video of the walk through we did this year. The video is a bit jumpy because of the poor internet connection in the flea market area but if you have patience you can see everything we did:

[Boat Anchor Hunting at Dayton Hamvention 2026 | Howard WB2UZE & Mike N1CC from the Flea Market](#)

Thanks to Jim W6JIM for the editing.

— Regards, Howard

## KIDS CW CLASS NOTES

– Bob Cady, W7JNM

It has been a busy and productive spring for the kids classes. We have many who have received or upgraded their license, got on the air, made their first cw contacts and also made personal accomplishments. Ken has been hard at work on the kids classes curriculum with input from our adult and student instructors and test classes with select students to see how they accept the methodology.

One of our high school students, Amir, KQ4EYR, made a presentation to his High School Class about Amateur Radio and CW. He is an accomplished musician on the trumpet also (has played in class for us) and will be on a special traveling group this summer.

Two of our students have become licensed hams. Galen, KD3CRK, one of our youngest students who was mentored by our student instructor, Asher, KFOQFB. He is now on his way to General! Also one of our newer students, Raiden, KR4LGR, just received his Tech license just before



going to Dayton and meeting our instructor Todd and Howard at the LICW booth.

Hamvention was well attended by many of our students and instructors. Richard, KE4WLE, Todd, NOIP,

Matt, K2EAG and Angela, N3ARB, Cathy W4CMG, and of course Chris, N8PEM who runs the forums at Dayton were there. Two of our students made presentations at Hamvention this year, Haley, KE2EVX, at the Youth Forum and Maggie, KE2AIZ at the LICW presentation. Three of Maggie's siblings are also licensed and were in attendance. Her brother Toby, KE2EDK, is also a student with LICW. Gabriel, KE2EEQ,



attended for the first time this year and is in the LICW group picture. Kirsten, KE8ZYD, one of our student instructors and her brother Ian, K18AN were also in attendance again this year.

We are all excited for Summer 2026 and getting out for POTA/SOTA and Field Day. The kids classes continue all summer as this is a time when schedules permit more time for radio! We will take a vacation break in the middle of summer. The Kids Classes wish you a wonderful summer and hope to make many contacts on the air with LICW members. ★



# KIDS CW CLASS NOTES (CONTINUED)



Galen receives his license



## A FIRST, QRP EXPERIENCE

– Michael F. Welborn, WW4MW

### GLASSY MOUNTAIN HERITAGE PRESERVE, WILDLIFE MANAGEMENT AREA US-8152 MAY 12, 2026

Often referred to by locals as “Glassy”, a place that I have been many times over the years, to take in the view of the Blue Ridge Mountain Range from the bald rock, that is often described as, “slick as glass”.

A year ago, I was learning the “ABC’s” of CW, by way of the Long Island CW Club. How I worked up the courage to join LICW? ... I may never know. It just felt right. A little over a year later I’m heading towards Glassy Mountain, in Pickens SC. It’s me, my Black Labrador Retriever and a borrowed QRP set up from my CW Mentor, Ed Bennett, W4EMB. I met Ed through his YouTube Channel, “Ed B”. I reached out to him seeking knowledge regarding purchasing a base rig. I expressed to him early on, that I had big interest and even big plans with CW / QRP. A few weeks later a package sat at my door with everything I would need to do a real POTA Activation, QRP style. Ed had loaned me the Pentek TR-45, along with a QRP tuned End Fed Halfwave antenna that he had made himself. Upon opening the box and looking inside the bag of goods; I’m thinking, “OK, now all of this is getting real!” At that point I knew I was going to make it to the next stage.

POTA activation day, (May 12, 2026) was, as pretty a day in the Month of May as the Carolina Hills could offer. However, I had made this trip with successful intent before, on May 2nd and May 6th. While the first two attempts were a success in they way of CW experiences and time well spent with my girl Magnolia



May, aka “Maggie”, I left without a true POTA activation of 10 contacts, but was able to reach as far North as Newfoundland, CA. Totaling 7 contacts the first time and 8 the next.

My intent was to gain the experience with my friend and family member and take the successes as they came, it didn’t matter if the 3rd time out was deemed a success or not, but success is good too! I was set on getting the required 10 my way. Before trying this I took a strong look at what I was interested in. I had been raised outdoors, and live my life outdoors as much as possible to this day. I had an early feeling that QRP was where I would find my CW moments.

For me, SOTA has all the appeal. However at some point, I took advice



from multiple people who advised me to try POTA first. I’ve been hunting POTA for a couple of months now and have gained immeasurable knowledge, by hunting some of the best out there. Maggie and I were set. We were hiking in on the Glassy Mountain Trail, and basically treating this POTA, as SOTA. Yes, my intention from the start was to make this first activation as hard on myself as possible. I wanted to feel like we earned it and went the extra mile to get our CW experience. The hike on the trail is pretty standard, but the bald rock is steep, slick and a challenge for many.

We hiked in, on May 12, for the third time. By now it felt routine. But how about the unknown? Basically no experience, Atmospheric conditions, position of antenna, try another spot on the North West side or stick with my now regular spot on the North East side? All questions with only guesses for answers.

We ended up in the same spot as before, in part because it had good shade for Maggie. And too, I was determined to make this spot work. We set up on the 20 Meter Band, at Frequency 14.067 and began CQ.

About an hour and a half later we had accumulated 1 POTA Activator and 11 hunter contacts in our Activator





Log, thanks in part to a couple of Ops that I know have me in their HamAlert app. I was exhausted from the whole experience, which is what I was really after. The only reason we quit at that point was because in my push to get the 10, I drained my one and only battery. I had received a re-spot on the POTA page from KM3STU, (a really great LICW instructor) wishing me luck and saying that conditions were rough. Being a novice Op, I was hoping to have a few extra hunters logged, in case I had made a mistake with the pencil. Extra batteries are a good thing and will be in my future QRP pack.

To finish the occasion and take it all in we packed up the QRP bag and broke into the lunch bag. It was a good place to be, and the reality of this CW



stage I had reached began to set in. Some months back, it was 2am and I was sitting at the kitchen table going over and over the CW alphabet. Maybe it was blind ambition, but something had set in on me. I had been able to see the small early accomplishments of the CW Journey coming one, then another. If you can give yourself a tiny bit of patience each day, you see things start to develop, and the Stages of CW start to appear before you.

Like so many aspects of CW, everything about this activation was a total learning experience. It's one thing to deploy the antenna in the backyard and work the Pentek TR-45 radio on a practice run off the deck. But here we were on the side of a mountain doing



the real thing, I, Me, and my friend of 7 years now. For some it may seem a bit over dramatized. For me it was the realization that I started with no knowledge of CW, no equipment and no deep rooted amateur radio background. What I did have was desire and some really good people that I have met, who want to extend their knowledge and success to others. I've been influenced by hundreds of CW ops now, and in knowing that, I often think and ask myself how can I pay the generosity back. The only answer I can come up with is to pay it forward and extend my knowledge and generosity to others.



I have listed below, some credits and links that I hope are of some interest.

- *Location:* US-8152 Glassy Mountain Heritage Preserve Wildlife Management Area
- *Radio:* Pentek TR-45 Lite (Skinny)
- *Antenna:* End Fed Halfwave (EFHW)
- *Keys:* CW Morse straight key, RLP paddle (for back up)
- *Battery:* Bioenno Power
- *Logging:* Hand logged
- *Support / Navigation / Security/ Faithful Friend:* Miss Maggie
- <https://www.sctrails.net/trails/trail/glassy-mountain>

## CREDITS:

**W4EMB** CW mentor and massive amounts of influence Ed B - YouTube

**KM3STU** LICW Instructor that made me want to get out and Activate POTA, Influencer

**KG4CXW** Fellow student, motivator, Influencer

**WW4JET** Amateur Radio Influencer

**Fred G. Welborn**, man of the mountain. ★

## WILD ABOUT BUGS

– Tom Waits, WA9CW

### HOW TO SEND WITH A BUG?

First, let me say, there is no “one way” to send Morse code with a bug. As the old saying goes, “the proof is in the pudding” so regardless of anything else, the code in the ear of the receiving operator is what really matters. There are techniques that make producing that beautiful code more doable.

But, what is good code in the first place? Understanding this is the first step toward good sending.

What do we want to make it sound like?

We have all heard of the 3 to 1 ratio for dashes to dots. This simply means, at a particular sending speed, the duration of a proper dash is 3 times longer than the length of a dit at the same speed.

The space between them is known as the inter-element space. The timing of that space gets faster or slower based on the code speed but it's always the length in time of one dit. The ratios stays the same and the “on time” for the dits and dahs changes so that the Morse characters sound the same whether slow or fast.

There is no need to dwell on this for too long but it is important to be aware that this ratio exists. All the elements are important, but the one that is most critical for accurate copy is the space.

All the Morse code characters have a unique sound to them that is made possible only with proper spaces. Let's examine the letter R for example. There are 3 elements and two spaces in the letter itself. Get the first space too long and the R becomes an E followed by an N. If you get the second inter-element space too long, the R becomes an A followed by an

E. That's easy enough to understand but in practice, inter-element spacing errors are probably the most common ones we make.

If you have ever used an automatic keyer and paddle, the dit-dah ratio was set for you so the big challenge was to get the spaces in the right places. When using a *BUG*, the dits are automatic but the dahs and the spaces are the responsibility of the sender. There is more coordination and timing involved in forming characters and stringing them together into words. Notice that I said, string them together. Just like the beads on a necklaces, Morse code characters are individuals that are presented in strings to form letters and words and thoughts. The timing is the thing that makes this possible.

So let's apply this to bug sending. Bugs are mechanical instruments so they require more energy to make them operate correctly. The amount of energy varies with the setup and the amount of weight on the pendulum. Simply put, the more weight that needs to be pushed around needs more energy imparted into the instrument to make it function properly. Very often, we acquire a bug that is just too fast even at the lowest speed. So, extra weight gets added to compensate and slow things down. The extra weight adds inertia, and more torque has to be imposed on the paddle to create a clean steady string of dits. If the bug needs to run fast, then less weight is required and a lighter strike can be used to manipulate the paddle. I use the word strike to describe the movement of the hand to emphasize the difference in bug sending and paddle sending. With a paddle and keyer, the slightest close of the contacts results in a beautiful clean string of dits or dahs. No force is required other than to move the paddle arm. With a bug, some force is required to

overcome the inertia of the pendulum and generate sufficient energy for the number of dits required. This is not a great deal of force but if it is not there, the result can be poor quality dits. As suggested earlier, if there is more weight on the pendulum, more force is required. This is a problem many beginners run into when slowing the bug down below speeds that they are not designed for. One of the primary causes of scratchy or missed dits is simply insufficient energy imparted to the paddle. Misunderstanding the situation has led to all kinds of “fixes” from dit tamers made of wire, dental floss, and foam rubber. Sometimes these things are of real benefit but more often the problem lies in the manipulation rather than the instrument.

OK, if we understand the requirement of good code and the mechanical needs of the key, we have won half the battle of sending on a Bug. The asymmetrical nature of the bug is what separates it from all the other keys. It is also what makes it the most challenging to learn to use. Automatic dits and manual dahs, paddle/knob, weight and speed of the pendulum are all relative to the bug. Although there is some adjusting that can be done, they are relatively fixed. Thumb, finger, arm movement, rested or free, hand supported or free moving and unsupported. These are all the things within the direct control of the sender and the things that work together to create the individual bug fist and unique signature on the air.

Let's look at the things we have the most control over. Thumb and finger, what goes where? The geometry of the paddle and knob go a long way in suggesting how they are intended to be used. Add to that the idea of transitioning from a straight key to the bug and we can see that the thumb makes the dits. Not many choices



there because most of us only have only one thumb. When the hand is positioned at the paddle, the thumb is a natural fit to the paddle and falls in line behind the fingers which reach out to the knob. When it comes to the fingers, they make the dashes but since there are four of them, we have a few more options of how to use them. The size and position of the hand along with the height of the bug above the desk may dictate which finger or fingers are used. All that said, the index finger is probably the most common choice and a combination of index and middle would be the next choice by most bug users.

Some operators will place the hand almost palm down and send dashes with the side of or knuckle of the index finger. Many of us have the back of the hand perpendicular to the desk top and the hand may be supported on the side of the palm or little finger or completely off the desk to move freely and unsupported. Either way, the thumb and finger work together with a rolling motion of the arm to manipulate the paddle and knob. The fingers remain fairly quiet for slower speed sending but as the speed picks up, the velocity can be increased when the arm rolls and the finger reaches to make contact with the paddle or knob. It can be thought of as a compound movement, with the finger being more or less active depending on the speed of the sending. If the hand is kept close

to the lever, movement can be more relaxed and quiet as sending speed increases. If the hand moves further away from the lever, closing the distance means more hand speed is required to keep the timing tight and consistent. Both ways of manipulating the key are valid and subject to personal preference.

So, how do you send with a bug? Here's the short answer: 1) know the code and understand the timing and spacing; 2) satisfy the mechanical needs of the bug by using arm movement to create the energy rather than rely primarily on the thumb and index finger to do the work. Accomplish this and you will be able to improve seamlessly to whatever level you wish with proper practice. It is common in some of the Bug Nets that someone will close out with, "its been great to hear all the bug music". You may also hear about someone's hand seeming to be dancing as they are sending. I think both could be considered compliments. So, weather you like to Jitterbug, Texas Two Step or Waltz, put that bug on the air and make some music. I know that was corny but its time to quit and move on. Thanks for supporting Wild About Bugs and the Sending and Copy Class. Feel free to email me with any questions, I'm good on QRZ and always happy to hear from you.

Thanks and 73! ★

– Tom WA9CW

## LICW FORUM AT HAMVENTION 2026 NOW ON OUR YOUTUBE CHANNEL

LICW had the honor of presenting again in a Hamvention forum on Friday May 15. We decided on a different format:

### *"Our CW Journeys and how you can have one too"*

This presentation was a blend of our members' personal experiences and club background. We are very thankful to all the members who spoke from the heart, which delivered a very unique presentation. After finishing, we received a number of emails from people stating how touched and connected they were with the speakers, and one even saying they had to wipe away some tears. I can't tell how much that meant to me and I am personally very grateful to all those that spoke so frankly and beautifully.

Have a look here as member Jim W6JIM did some magic again extracting and editing our portion from a nonstop video made by Hamvention of that forum room: [Our CW Journeys and How You Can Have One Too | LICW at Hamvention 2026](#). ★

– Regards, Howard

## IS MORSE CODE STILL ALIVE?

Morse code is far from dead; it is actively used and thriving. While no longer required for commercial or standard amateur radio licensing, it remains widely utilized by military branches, marine operators, and a passionate global community of amateur ("ham") radio enthusiasts.

### **Why Morse Code Survives**

**Superior Range:** Continuous Wave (CW) Morse code signals can cut through static and background noise much better than voice transmissions,

making it incredibly effective when other communication methods fail.

**Universal Language:** Because it operates on a standardized, visual and auditory rhythm, operators who do not speak the same language can still communicate.

**Accessibility & Assistive Tech:** Morse code is actively used today to assist quadriplegics and individuals with limited mobility in operating computers and communication devices.

### **Where It Is Used Today**

**Amateur Radio:** Thousands of hobbyists actively use Morse code on shortwave

(HF) bands. It is celebrated for its meditative challenge and the ability to build simple, low-power transmitters.

**Marine & Aviation:** It continues to serve as an emergency backup method on the water, allowing ships to communicate via signal lights when radios fail.

**Military:** It remains an invaluable stealth communication tool that allows forces to maintain radio silence. ★

– Dr. Jim Kennedy, K2PHD

## CLUBMEMBER NOTES

I am saddened to hear that anyone gives up, or if people feel they cannot learn CW. I can very much empathize with the feelings. I am not very far from my first class in LICW and I clearly remember being discouraged and having many of these same feelings. I reached out and got support from club instructors, which made all the difference for me. I wrote a message that I felt stuck between BC and Intermediate 1. I really thought I had gone as far as I could and I just was never going to get any further.

I was very wrong. Very, very wrong. With help and encouragement, I attended the first bootcamp. This opened my eyes to where I want to be and how to get there. Was I a CW wiz kid when I got through? No way. But I saw that light. So I kept going. And I am SO glad that I did.

I have been doing many POTA activations and I love doing CW activations. I was so nervous after my first CW activation that I was shaking for a long time afterward. But I called one of the LICW instructors and he talked me off the cliff and I kept going. I cannot thank the people that have helped me enough.

I am now teaching BC classes and I am very glad to give back to LICW after all they have given me.

Am I where I want to be? No way – I have a long way to go. But that is OK – I enjoy the learning and the challenge.

If you feel stuck, or feel you cannot learn CW, reach out to an instructor you know. Find one that you feel comfortable with. Find one that communicates in a way that helps you. LICW has a lot of great instructors but you need to find the one that clicks with you. Then reach out.

The reward at the end is worth the long journey. I wish all of you the best.

– Nancy KD7S via groups.io

\* \* \*

Nancy's penultimate paragraphs say it all.

*"If you feel stuck, or feel you cannot learn CW, reach out to an instructor you know. Find one that you feel comfortable with. Find one that communicates in a way that helps you. LICW has a lot of great instructors but you need to find the one that clicks with you. Then reach out."*

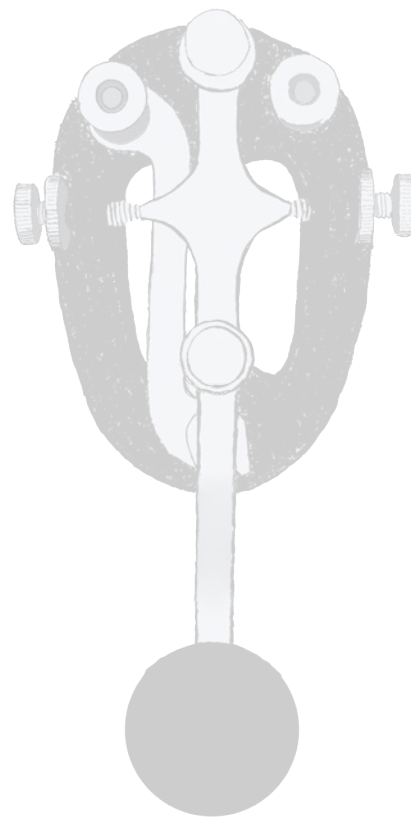
The old saw that it's not the destination, it's the journey ... is also slightly off and the real point is that it's not the journey, either, it's the company. Learning can be lonely and we are all our own worse critics when it comes to measuring ourselves. One real key is to be able to spend time with others who have travelled at least some of the same road and are able to "hold your hand" as you learn to cross busy streets. To use what is today a less familiar metaphor, a good moan down the pub does a body wonders. Our working equivalent is probably better as a coffee morning (doughnuts optional, of course) or a local club or group jaunt.

For those of you who visited the Four Days in May event or Hamvention (or both if you're a real radio squirrel) you found more than a taste of genuine enthusiasm and encouragement. Seriously, look up anyone that's an LICW wonk and ask for help. It may be that they are local to you or know folk who are close by.

For those who are in the "I am not good enough" camp, it's a language and it's not some deep secret one either ... remember that everyone learns to speak in the same way, listen and repeat. It really isn't any different to pretty much any skill or competence, it's effortful and takes practice and, like eating a whale, it's one bite at a time. The caveat is moderation and you can't finish it in one sitting ... or at least I can't.

We really are just doing it for fun and you can too.

– Roland AE6VL via groups.io



## THE DOCTOR IS IN

by Greg Algieri, WA1JXR

Hello fellow LICW members! The LICW Club has been active this Spring/Summer in New England.

The LICW Club was represented at the Spring session of the New England Amateur Radio Festival (NEAR Fest) held in New Boston, NH. Check out their website:

[Home - NEAR-Fest.com](#)

LICW sponsored a booth/table in the log barn. We had many people stop by the table, ask questions and take away an information pamphlet about the club and maybe a LICW sticker. We also had plenty of help manning the LICW table from members who attended the event. A great time was had by all and I think maybe we were able to get some new members to join LICW.

Looking forward to the 2026 Ham Exposition in August.

The Doctor Is In forum is held Monday Evenings 7PM EST in Zoom B.

Videos of the forum can be found in Drop Box # 35

The Forum is an Open Forum format. We sometimes have a specific topic or presentation but most of the time it is open format and we discuss your question or topic. Please come to the Forum with your questions?? If you have suggestions for topics you would like to see covered and discussed please send me an e-mail at [wa1jxr@comcast.net](mailto:wa1jxr@comcast.net) with your ideas.

Please join us on Monday evenings 7PM Zoom B

Looking forward to a fun Summer and thanks for all the support for the forum. ★

73

Greg WA1JXR

LICW # 413



(L to R) Steve N1SG, Greg WA1JXR

## MORSE CODE WORLD UPDATE

I'm happy to announce an update to the [Morse Code World training tools](#). 108 files changed, 5,658 lines added, 3,800 removed.

Press "Update" in any of the pages' title area to update to the latest version (v2026-05-27).

### Speech Controls

**Spelling/phonetic alphabet option** — toggle "Use spelling alphabet" in Speech Controls to have isolated letters spoken as their phonetic alphabet word (e.g. A = "Alfa", B = "Bravo"). The alphabet used matches the selected voice's language.

**Language filter** — the Voice Controls modal now has a separate Language dropdown so you can narrow the voice list to voices in a specific language.

**Offline voice handling** — when you lose your internet connection, the voice automatically switches to the best available local (on-device) voice, and

switches back to your preferred cloud voice when you reconnect. If no local voices are installed, speech is disabled with a clear message.

**Better unavailability reporting** — if no text-to-speech voices are found, a warning appears with a Retry button in Speech Controls, and any speech buttons are disabled with an explanation.

**Bug fix** — fixed a crash on Firefox and some iOS configurations where voices loaded asynchronously and a message was triggered before they were ready.

### Dialogs

All settings and control dialogs have been rebuilt using the browser's native dialog element. This improves accessibility, keyboard navigation (Escape to close, correct focus handling), and visual consistency.

### Accessibility

Added a skip-to-content link for keyboard and screen reader users.

Improved landmark regions throughout the site.

Better ARIA labels on modal open buttons.

Improved tab order and keyboard accessibility across controls.

Screen reader context added to call-to-action links.

Improved tooltip keyboard handling.

### Performance

Removed the jQuery 2, Foundation JS, and Modernize dependencies site-wide. This reduces external requests and removes ~100 kB of legacy JavaScript from every page load.

...and more.

I've also added more automated tests, so fingers crossed I've not broken anything. If I have, do let me know! ★

— Stephen Phillips

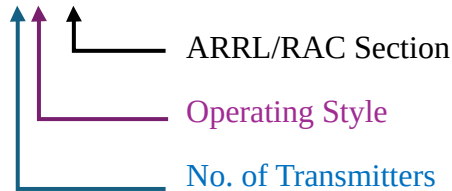
# ARRL Field Day Exchange

Define the two exchange components:

- a. **Class** (number of transmitters + power source)
- b. **Section** (ARRL/RAC section abbreviation)

Parts of the Information Exchange (CW format):

- a. “**1D TN**” — One transmitter, home/commercial power, Tennessee.



- b. *Example*: “**3A WPA**” — Three transmitters, club portable, Western Pennsylvania.

Class	Meaning
A	Club / Non-Club Portable
B	One or Two-Person Portable
C	Mobile
D	Home Station (Commercial Power)
E	Home Station (Emergency Power)
F	EOC Station

## example

Using **Clarksville Amateur Transmitting Society** call sign

CQ FD KF4L KF4L FD

KC9GBX

KC9BGX 4A TN

R TU 1E WI

TU KF4L

1. For Field Day, there are often **2 operators** at a CW station. One operator can copy and log contacts while the second operator runs the station. And they can trade off duties.
2. **Logging software** is often a helpful tool used during Field Day.
  - a. N3FJP logging software is a common tool. It helps to avoid duplicate contacts. Link: <https://www.n3fjp.com> and is used for more than just field day. (**Note: In case students ask** about how to get the software, there is a cost and the best value for this software is the N3FJP Software Registration Package - \$59.99 with free upgrades)



## FIELD DAY SECTIONS AND CLASSES

Class	Meaning
A	Club / Non-Club Portable
B	One or Two-Person Portable
C	Mobile
D	Home Station (Commercial Power)
E	Home Station (Emergency Power)
F	EOC Station

### Abrev Section

AB	Alberta
AK	Alaska
AL	Alabama
AR	Arkansas
AZ	Arizona
BC	British Columbia
CO	Colorado
CT	Connecticut
DE	Delaware
DX	Non-US/Non-Canada (DX)
EB	East Bay
EMA	Eastern Massachusetts
ENY	Eastern New York
EPA	Eastern Pennsylvania
EWA	Eastern Washington
GA	Georgia
GH	Golden Horseshoe (Ontario)
GTA	Greater Toronto Area (older)
IA	Iowa
ID	Idaho
IL	Illinois
IN	Indiana
KS	Kansas
KY	Kentucky
LA	Louisiana
LAX	Los Angeles
MB	Manitoba
MDC	Maryland-DC
ME	Maine
MI	Michigan
MN	Minnesota
MO	Missouri
MS	Mississippi
MT	Montana
NB	New Brunswick
NC	North Carolina
ND	North Dakota
NE	Nebraska

NH	New Hampshire
NL	Newfoundland & Labrador
NLI	New York City-Long Island
NM	New Mexico
NNJ	Northern New Jersey
NNY	Northern New York
NT	Northern Territories (Yukon, NWT, Nunavut)
NTX	North Texas
OH	Ohio
OK	Oklahoma
ONE	Ontario East
ONN	Ontario North
ONS	Ontario South
OR	Oregon
ORG	Orange (CA)
PAC	Pacific
PE	Prince Edward Island
PR	Puerto Rico
QC	Quebec
RI	Rhode Island
SB	Santa Barbara
SC	South Carolina
SCV	Santa Clara Valley
SD	South Dakota
SDG	San Diego
SF	San Francisco
SJV	San Joaquin Valley
SK	Saskatchewan
SFL	South Florida
SNJ	Southern New Jersey
STX	South Texas
SV	Sacramento Valley
TN	Tennessee
UT	Utah
VA	Virginia
VI	U.S. Virgin Islands
VT	Vermont
WCF	West Central Florida
WI	Wisconsin
WMA	Western Massachusetts
WNY	Western New York
WPA	Western Pennsylvania
WTX	West Texas
WWA	Western Washington
WV	West Virginia
WY	Wyoming

# CW QSO PROTOCOL

Prepared by W6JIM



## PROTOCOL-1

(their call) DE (your call)

1. GM/GA/GE ES TNX FER (CALL/RPRT)
2. UR RST 599
3. QTH FRESNO, CA
4. NAME JIM
5. OK HW?  $\overline{AR}$

} x2

(their call) DE (your call) K

Key-Words:

RST - QTH - NAME

## PROTOCOL-2

(their call) DE (your call)

1. OK (John) FB ES TNX FER (INFO/RPRT)
2. RIG IC 7300 ES PWR 50W
3. ANT DIPOLE UP 45 FT
4. WX Rain ES TEMP 50F
5. OK (John) HW?  $\overline{AR}$

(their call) DE (your call) K

Notes:

## PROTOCOL-3

(their call) DE (your call)

1. OK (John) SOLID CPY
2. AGE 55 YRS
3. BEEN HAM FER 25 YRS
4. MY KEY J38
5. OK (John) HW?  $\overline{AR}$

(their call) DE (your call) K

Notes:

## ENDING

(their call) DE (your call)

1. OK (John) TNX FER FB QSO
2. ES HP CUAGN 73  $\overline{AR}$

(their call) DE (your call) TU  $\overline{SK}$

Notes:

(Send closing "Dits" as described on next page)



## CW QSO PROTOCOL (CONTINUED)

### Additional Info

1. QRL? - Before calling CQ. Call **QRL?** at least twice to ensure the frequency is not in use
2. Calling CQ - A typical CQ call is in a 2 x 2 format: **CQ CQ DE (your call) (your call) K**
  - a. Wait then repeat, if necessary, again 2 x 2. No need to call lengthy CQs
  - b. Stations most typically respond with **(your call) DE (their call) (their call) K**
  - c. When a station answers your CQ begin protocol P1 using the **TNX FER CALL** option
3. Answering a CQ - Answer a CQ by sending **(their call) DE (your call) (your call) K**
  - a. The calling station will go through protocol-1 then hand it back to you
  - b. Now you start protocol-1 using the **TNX FER RPRT** option
4. Ending - other station starts the ending sequence:
  - a. Come back after the  $\overline{SK}$  like you normally would for a K
  - b. Answer any open questions, say anything else you want to share, then initiate Ending
  - c. After sending your  $\overline{SK}$  send **2-dits**. The other station will send 2-dits back & your QSO is done!
5. Ending - you start the ending sequence:
  - a. Wait for the other station to finish their turn after you  $\overline{SK}$
  - b. Send **2-dits** after the other station sends theirs and your QSO is done!
6. Repeat important information (RST, QTH, Name) twice
  - a. RST, QTH, and Name and anything else that you feel is important (like club numbers)
7. **BK** – is used in quick QSOs in place of the Callsign Exchange. When you're handed the QSO with a **BK** you acknowledge by starting with a **BK**. **BK** is not a pro-sign. There is space between the B and the K
  - a. Example:
    - i. (other station) OK JIM, UR RIG AGN? **BK**
    - ii. (W6JIM) **BK** RIG HR IS TEN TEC EAGLE, TEN TEC EAGLE **BK**
    - iii. (other station) **BK** OK JIM FB ON UR TEN TEC EAGLE....
8. R R - stands for Roger-Roger.
  - a. It is sometimes (not required) sent before you start your portion of the exchange
  - b. Only do this if you fully understood the other stations message
  - c. Example: **R R** (their call) DE (your call) FB CPY JOHN ES TNX FER NICE RPRT
9.  $\overline{BT}$  is used to separate topics or to fill dead air like a verbal pause
10. The Callsign Exchange: **(their Call) DE (your call)**
  - a. In a Standard QSO, each turn starts and ends with **(their Call) DE (your call)**
11. For extended Rag-Chews
  - a. Write down some info to share in case you draw a blank
  - b. You may start with the callsign exchange and roll into abbreviated "BK" in a long QSO
  - c. Don't forget to identify your station with a callsign exchange every 10 minutes (minimum)
12. The examples in this reference sheet are just that, examples
  - a. Feel free to tailor your content as you become more comfortable and hear more QSOs
  - b. Abbreviations may differ (Name vs OP, CUAGN vs CUL, CPY vs CPI) , etc....
  - c. **Please edit this document to make it work for you!**

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## SKCC QSO Protocol

A basic guide to get new ops on the air



### **STANDARD CQ:**

*CQ SKCC CQ SKCC DE KF6FC KF6FCV K*

#### NOTE

1. This is simply Standard QSO Protocol with the addition of your SKCC Number
2. **OP** often used instead of **NAME**
3. **QTH** often sent as state abbreviation
4. Most QSOs will be just one exchange
5. Ending is sometimes sent like sprint

### **ENDING:**

Standard QSO Protocol Ending

### **CQ RESPONSE:**

*KF6FCV DE (your call) (your call) K*

### **EXCHANGE:**

1. *GE ES TNX FER CALL*
2. *UR RST 599 5NN*
3. *QTH CA, CA*
4. *OP BOB BOB*
5. *SKCC 15169T NR 15169T*
6. *OK HW?*
7. *KF6FCV DE (your call) K*

### **ENDING RESPONSE**

Standard QSO Protocol Ending

### **WEEKEND SPRINT (WES) CQ**

*CQ WES DE KF6FCV WES*

#### NOTE

1. Drop all the extras and just send the data
2. Break (BK) is used instead of a formal callsign exchange to keep things moving
3. The ending is shortened

### **ENDING EXAMPLES:**

TU DIT-DIT

RR TU 73 DIT-DIT

TNX BOB ES 73 DE KF6FCV SK DIT-DIT

### **SPRINT CQ RESPONSE:**

*(your call) Send your call once or twice*

### **SPRINT EXCHANGE:**

*UR 599 CA BOB SKCC 15169T BK*

### **ENDING RESPONSE EXAMPLES:**

TU SK DIT-DIT

TU 73 DIT-DIT

DE (YOUR CALL) TU SK DIT-DIT



### Additional Info

1. Standard QSO Format used in non-sprint type events such as:
  - a. Straight Key Night
  - b. Slow Speed Saunter
  - c. Anytime you are calling CQ SKCC during a non-event period
  
2. Sprint QSO format used during sprint events such as:
  - a. Weekend Sprint (WES)
  - b. Two-Hour Sprint
  - c. Any event with the word “sprint” in the title
  
3. **BK** – Stands for “Break”. BK takes the place of the Callsign Exchange when passing the QSO to the other operator. When you get handed the QSO with a **BK** you acknowledge by starting with a **BK**.
  - a. Example:
    - i. (N1CC): UR 599 AZ MIKE SKCC 22261 **BK**
    - ii. (KF6FCV): BK RR TNX MIKE UR 559 CA JIM 15169T **BK**
    - iii. (N1CC): **BK** OK JIM GL DE N1CC TU SK DIT-DIT
  
4. QTH
  - a. In SKCC QSOs the QTH is often sent as just the state abbreviation. This is standard practice in sprints. But it is also common in standard SKCC QSOs
  
5. Name/Op
  - a. In SKCC QSOs, the abbreviation “OP” which is short for “Operator” is often used instead of “NAME”. Either is fine.
  
6. Ending
  - a. In SKCC sprints, the ending is abbreviated to keep things moving quickly
  - b. You will hear something like one of these examples:
    - i. BK OK BILL ES 73 DE K2MZ TU SK DIT-DIT
    - ii. BK RR TU 73 DIT-DIT
  - c. When the “DITS” are sent up-front, it is a signal to keep your good-bye short. Here are some examples:
    - i. DE KF6FCV TU DIT-DIT
    - ii. TU 73 DIT-DIT
    - iii. DIT-DIT

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### Procedural Signals (Prosigns) for Morse Code

*NOTE: BK is NOT a prosign, despite what you might see elsewhere. It is NOT sent as one character, like the a prosign, rather it is sent as B K.*

**CQ** - Calling any station

**AR** - "+" over, end of message

**K** - go, invite any station to transmit

**KN** - "(" go only, invite a specific station to transmit

**R** - all received OK

**AS** - please stand by

**SK** - end of contact (sent before call)

**CL** - going off the air (clear)

### Q Signals (or Q Abbreviations)

*Q Signals take the form of a question only when each is followed by a question mark.*

**QRG** - Will you tell me my exact frequency (or that of \_\_\_)?  
Your exact frequency (or that of \_\_\_) is \_\_\_ kHz.

**QRH** - Does my frequency vary?  
Your frequency varies.

**QRI** - How is the tone of my transmission?  
The tone of your transmission is \_\_\_. (1. Good 2. Variable 3. Bad)

**QRJ** - Are you receiving me badly?  
I can not receive you. Your signals are too weak.

**QRK** - What is the intelligibility of my signals (or those of \_\_\_)?  
The intelligibility of your signals (or those of \_\_\_) is:  
(1. Bad 2. Poor 3. Fair 4. Good 5. Excellent)

**QRL** - Are you busy?  
I am busy (or I am busy with \_\_\_). Please do not interfere.

**QRM** - Is my transmission being interfered with?  
Your transmission is being interfered with \_\_\_.  
(1. Nil 2. Slightly 3. Moderately 4. Severely 5. Extremely)



## PROSIGNS AND Q-SIGNALS (CONTINUED)

**QRN** - Are you troubled by static?

I am troubled by static ---. (1-5 as under QRM)

**QRO** - Shall I increase power?

Increase power.

**QRP** - Shall I decrease power?

Decrease power.

**QRQ** - Shall I send faster?

Send faster \_\_\_\_\_. (WPM)

**QRS** - Shall I send more slowly?

Send more slowly.

**QRT** - Shall I stop sending?

Stop sending.

**QRU** - Have you anything for me?

I have nothing for you.

**QRV** - Are you ready?

I am ready.

**QRW** - Shall I inform \_\_\_\_ that you are calling on \_\_\_\_ kHz?

Please inform \_\_\_\_ that I am calling on \_\_\_\_ kHz.

**QRX** - When will you call me again?

I will call you again at \_\_\_\_ hours (on \_\_\_\_ kHz).

**QRY** - What is my turn?

Your turn is numbered \_\_\_\_.

**QRZ** - Who is calling me?

You are being called by \_\_\_\_ (on \_\_\_\_ kHz).

**QSA** - What is the strength of my signals (or those of \_\_\_\_)?

The strength of you signals (or those of \_\_\_\_) is \_\_\_\_.

(1. Scarcely perceptible 2. Weak 3. Fairly good 4. Good 5. Very good)

**QSB** - Are my signals fading?

Your signals are fading.

**QSD** - Is my keying defective?

Your keying is defective?

**QSG** - Shall I send \_\_\_\_ messages at a time?

Send \_\_\_\_ messages at a time.

**QSK** - Can you hear me in between your signals and if so, can I break in on your transmission?

I can hear you between my signals; break in on my transmission.

## PROSIGNS AND Q-SIGNALS (CONTINUED)

**QSL** - Can you acknowledge receipt?

I am acknowledging receipt.

**QSM** - Shall I repeat the last message I sent you, or some previous message?

Repeat the last message you sent me [or message(s) number(s) \_\_\_\_].

**QSN** - Did you hear me (or \_\_\_\_ ) on \_\_\_\_ kHz?

I did hear you (or \_\_\_\_ ) on \_\_\_\_ kHz.

**QSO** - Can you communicate with \_\_\_\_ direct or by relay?

I can communicate with \_\_\_\_ direct (or by relay through \_\_\_\_).

**QSP** - Will you relay to \_\_\_\_?

I will relay to \_\_\_\_.

**QST** - General call preceding a message addressed to all amateurs and ARRL members. This is in effect, "CQ ARRL".

**QSU** - Shall I send or reply on this frequency (or on \_\_\_\_ kHz)?

Send a series of Vs on this frequency (or on \_\_\_\_ kHz).

**QSW** - Will you send on this frequency (or on \_\_\_\_ kHz)?

I am going to send on this frequency (or on \_\_\_\_ kHz).

**QSX** - Will you listen to \_\_\_\_ on \_\_\_\_ kHz?

I am listening to \_\_\_\_ on \_\_\_\_ kHz.

**QSY** - Shall I change to to transmission on another frequency?

Change transmission to another frequency (or \_\_\_\_ kHz).

**QSZ** - Shall I send each word or group more than once?

Send each word or group twice (or \_\_\_\_ times).

**QTA** - Shall I cancel message number \_\_\_\_?

Cancel message number \_\_\_\_.

**QTB** - Do you agree with my counting of words?

I do not agree with your counting of words. I will repeat the first letter or digit of each word or group.

**QTC** - How many messages have you to send?

I have \_\_\_\_ messages for you (or for \_\_\_\_).

**QTH** - What is your location?

My location is \_\_\_\_.

**QTR** - What is the correct time?

The correct time is \_\_\_\_.

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# UTC TIME CONVERSION CHART

## UTC (Zulu) Time Conversion Chart

UTC (Zulu)	PST/ALDT	PDT/MST	MDT/CST	CDT/EST	EDT/AST	ALST	HST	UTC (Zulu)	PST/ALDT	PDT/MST	MDT/CST	CDT/EST	EDT/AST	ALST	HST
0000*	1600	1700	1800	1900	2000	1500	1400								
0100	1700	1800	1900	2000	2100	1600	1500	1300	0500	0600	0700	0800	0900	0400	0300
0200	1800	1900	2000	2100	2200	1700	1600	1400	0600	0700	0800	0900	1000	0500	0400
0300	1900	2000	2100	2200	2300	1800	1700	1500	0700	0800	0900	1000	1100	0600	0500
0400	2000	2100	2200	2300	0000*	1900	1800	1600	0800	0900	1000	1100	1200	0700	0600
0500	2100	2200	2300	0000*	0100	2000	1900	1700	0900	1000	1100	1200	1300	0800	0700
0600	2200	2300	0000*	0100	0200	2100	2000	1800	1000	1100	1200	1300	1400	0900	0800
0700	2300	0000*	0100	0200	0300	2200	2100	1900	1100	1200	1300	1400	1500	1000	0900
0800	0000*	0100	0200	0300	0400	2300	2200	2000	1200	1300	1400	1500	1600	1100	1000
0900	0100	0200	0300	0400	0500	0000*	2300	2100	1300	1400	1500	1600	1700	1200	1100
1000	0200	0300	0400	0500	0600	0100	0000*	2200	1400	1500	1600	1700	1800	1300	1200
1100	0300	0400	0500	0600	0700	0200	0100	2300	1500	1600	1700	1800	1900	1400	1300
1200	0400	0500	0600	0700	0800	0300	0200	2400	1600	1700	1800	1900	2000	1500	1400

\*0000 and 2400 are interchangeable.

2400 is associated with the date of the day ending, 0000 with the day just starting.

- UTC** = Coordinated Universal Time, or **Zulu**
- PST** = Pacific Standard Time (UTC - 8 hours)
- ALDT** = Alaskan Daylight Time (UTC - 8 hours)
- PDT** = Pacific Daylight Time (UTC - 7 hours)
- MST** = Mountain Standard Time (UTC - 7 hours)
- MDT** = Mountain Daylight Time (UTC - 6 hours)
- CST** = Central Standard Time (UTC - 6 hours)
- CDT** = Central Daylight Time (UTC - 5 hours)
- EST** = Eastern Standard Time (UTC - 5 hours)
- EDT** = Eastern Daylight Time (UTC - 4 hours)
- AST** = Atlantic Standard Time (UTC - 4 hours)
- ALST** = Alaskan Standard Time (UTC - 9 hours)
- HST** = Hawaiian Standard Time (UTC - 10 hours)

Data from Feb. 2004 QST, p67, 68

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## CW ABBREVIATIONS MOST COMMONLY USED

**ABT:** about  
**ADR:** address  
**AGN:** again  
**ANS:** answer  
**ANT:** antenna

**B4:** before  
**BCNU:** be seeing you  
**BK:** break  
**Buro:** QSL bureau

**CFM:** confirm  
**CL:** closing down (leaving the air)  
**CLG:** calling  
**CNDX:** conditions  
**Congrats:** congratulations  
**CPI:** copy (I replaces the ending Y)  
**CUAGN:** see you again  
**CUL:** see you later  
**CUZ:** because

**DE:** from  
**DR:** dear  
**DSW:** das vedanya  
(until we meet again)

**DWN:** down  
**DX:** non USA station  
**EL:** elements  
**ES:** and  
**EU:** Europe  
**EVE:** evening

**FB:** fine business  
**FER:** for  
**FREQ:** frequency. You can also  
use QRG

**GA:** good afternoon  
**GA:** go ahead  
**GD:** good day  
**GE:** good evening  
**GG:** going  
**GL:** good luck  
**GLD:** glad  
**GM:** good morning  
**GN:** good night  
**GP:** ground plane  
**GUD:** good

**HI:** laughter and usually repeated 2 times  
**HNY:** happy new year  
**HPE:** hope  
**HR:** here  
**HRD:** heard  
**HVG:** having  
**HW?:** how copy

**INFO:** information  
**I I:** 2 letter I's spaced apart  
can take the place of sending a string of  
dits if you make an error.

**K:** transmission over to you

**LID:** poor op  
**LP:** long path propagation  
**LSN:** listen  
**LW:** long wire antenna

**MSG:** message  
**MX:** merry christmas

**NIL:** none



## CW ABBREVIATIONS MOST COMMONLY USED (CONTINUED)

**NR:** near

**NW:** now

**OK:** ok

**OM:** old man

**OP:** operator or name

**PSE:** please

**PWR:** power

**R:** roger

**RCVD:** received

**RIG:** station equipment

**RX:** receiver

**SA:** say, like say 73

**Shud:** should

**SIGS:** signals

**SKED:** schedule QSO time

**SRI:** sorry. Here again the I replaces the Y

**STN:** station

**Temp:** temperature

**TKS:** thanks

**TNX:** thanks

**TRBLE:** trouble

**TT:** that

**TU:** thank you

**TX:** transmitter

**U:** you

**UR:** your

**URS:** yours

**Vert:** vertical

**VY:** very

**WID:** with

**WKD:** worked

**WL:** will

**WPM:** words per minute

**WUD:** would

**WX:** weather

**XYL:** wife

**YL:** young lady

**YR:** year

**Z:** zulu or gmt time

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## **S(LOW) S(PPEED CON)T(EST) EXCHANGE**

**RUNNER: CQ SST (RUNNER CALL SIGN)**

**SEARCH & POUNCE PERSON: (YOUR CALL SIGN)**

**RUNNER: (S&P CALL SIGN) (RUNNER NAME) (RUNNER STATE)**

**S&P: GE (RUNNER NAME) (YOUR NAME) (YOUR STATE)**

**RUNNER: GL (S&P NAME) TU (YOUR CALL SIGN) SST**

## **A NOTE OF THANKS REGARDING LICW FIELD DAY TRAINING**

*Hello Friends,*

This has been a tremendous effort, and Howard and I want to offer our sincere thanks to everyone who helped bring this Field Day training initiative to life.

Special thanks to Stuart for developing the Field Day lesson plan. That work gave structure, focus, and purpose to the entire project.

Thank you as well to Cathy, Anthony, Kevin, Ken, Stuart, Jim, Mike, and Tim for your flexibility, commitment, and willingness to teach these Field Day classes. These sessions will be open to the broader amateur radio community, and each of you will be representing LICW in a very meaningful way.

You will not simply be teaching a class. You will be serving as ambassadors for LICW, for our method, and for the welcoming spirit that has made this club so special.

Behind the scenes, Nancy and David deserve our deep gratitude for their superb programming and development work. The member-facing and public-facing pieces of this project required real skill, time, and attention to detail. Their work made it possible for this effort to move from a good idea to something we can actually deliver.

We also want to thank Tom and Todd for their Field Day enhancements to the MPP and Flashcard Trainer. Those tools will help make the training more

practical, more focused, and more effective for the students and guests who participate.

This project reflects LICW at its best: instructors, developers, and volunteers working together to serve both our members and the broader amateur radio community. Field Day helped inspire the creation of LICW, and now we have an opportunity to share that same spirit with others.

Thank you all for helping make this possible. We are grateful for your talent, your generosity, and your commitment to our club.

73,

*Howard and Mike*



## CW CALLING FREQUENCIES

DE WB2UZE

Member Tony WV2C suggested the Club have a calling frequencies enabling members to find each other on the bands. So lets institute the following frequencies to use for calling CQ and looking for fellow members:

1837

3557

7057

14057

18077

21057

24897

28057

50097

## CALL FOR SUBMISSIONS

*For the LICW Newsletter, Fall Edition*

We need your articles and pictures for the Fall Edition of the LICW Newsletter! Do you have any good stories or original articles you would like to share? Are you planning any new antennas or projects for the shack? Share your plans and photos with us! There is also, of course, the thrill of seeing your name and call in print!

Are you planning any home-brew projects for the Fall? Tell us the details! Do you have any "hints and/or tips" to make operating easier and more fun? To make kit building more efficient? Support your Club with submissions for the Fall edition!

When you submit your articles and/or photos, please include your full name and callsign. Send all submissions to: [wb2gxm@arrl.net](mailto:wb2gxm@arrl.net). We accept most file formats including Microsoft Word, Notepad, Textedit, and PDF files, as well as most image file formats. ★

– The Editor

## OUTSIDE THE BOX

*Mark Those Cables!*

I save bag clips from bread loaves, produce, etc. Use solvent to wipe off the printed data on the clip and a marker to label what device is at the other end of the wire. Useful for AC power strip outputs, shack equipment connections, etc.

– Paul Tanzar, W4PDT



## THE LAST WORD

Thank you for reading The LICW Newsletter! We strive for quality and accuracy. If you notice an error, or a link that is incorrect or broken, please do tell us via [groups.io](https://groups.io), and we will correct it or print a notice about it in the next issue.

The Summer is a great time to get outside and work on all those antenna projects you never had time to get to when the weather was cold! Take your time, "measure three times and cut once," and **BE CAREFUL!** Respect heights and rough terrain! We want you to be around to see Fall!

In closing, I want to thank all the great clubmembers who went out of their way and took time to contribute to this newsletter. Without all of you and your talent, there would BE NO newsletter to read! I am indebted to all of you.

73 – The Editor

## RESOURCES ONLINE

This list is for convenience only and is not to be considered as an endorsement of any company or their products.

### Clubs and Organizations

[American Radio Relay League](#)  
[Ham Radio University](#)  
[Long Island CW Club](#)  
[SKCC](#)

### Online Stores

[DX Engineering](#)  
[Gigaparts](#)  
[Ham Radio Outlet](#)  
[Martin Lynch & Sons \(UK\)](#)  
[Powerwerx](#)  
[Radioddity](#)  
[R&L Electronics](#)  
[Waters & Stanton \(UK\)](#)

### Keys

[Begali](#)  
[CW Morse](#)  
[Modern Morse](#)  
[Vibroplex](#)

### Kits

[3rd Planet Solar](#)  
[Circuit Specialists](#)  
[Dan's Small Parts and Kits](#)  
[Electronics DIY](#)  
[Four State QRP Group](#)  
[HamGadgets](#)  
[HecKits](#)  
[HF Signals](#)  
[Kanga \(Phoenix\) Kits](#)  
[Midway](#)  
[NMOS](#)  
[Pololu](#)  
[QRP Guys](#)  
[QRP Kits](#)  
[QRP Labs](#)

### Parts

[Abra](#)  
[Adafruit](#)  
[Antique Electronic Supply](#)  
[Aretronics](#)

[Arrow](#)  
[Digikey](#)  
[Digikey](#)  
[Digiparts](#)  
[Electronics Goldmine](#)  
[Electronic Surplus](#)  
[Futurlec](#)  
[Jameco](#)  
[Kits and Parts](#)  
[LCSC](#)  
[Mike's Electronic Parts](#)  
[Mouser](#)  
[\(MPJA is closed\) Skycraft](#)  
[PJRC \(Arduino\)](#)  
[QRPme](#)  
[RF Parts](#)  
[ROWaves](#)  
[Sparkfun](#)  
[Surplus Sales](#)  
[Tayda](#)

### Antennas

[Alpha Antennas](#)  
[Balun Designs \(Balunsetc\)](#)  
[Chameleon](#)  
[Greyline](#)  
[Pacific Antenna](#)  
[Palomar Engineers](#)  
[RF Guru](#)  
[Vibroplex](#)

### PCBs

[Far Circuits](#)

### Wire, Cable and Connectors

[Davis RF](#)  
[RF Microwave](#)  
[Tech Fixx](#)  
[The Wireman](#)  
[True Ladderline](#)

### Online Tools

[Arduino](#)  
[Best EF Random Wire Lengths 1](#)  
[Best EF Random Wire Lengths 2](#)  
[Coil Inductance Calculator](#)  
[Coil Placment Calculator](#)  
[EFHW Antenna Calculator](#)  
[EFHW Antenna Designer](#)  
[Falstad Circuit Simulator](#)

[IanJohnston Online Tools](#)  
[KJ6ER Antennas Primer](#)  
[K8ZT Presentations](#)  
[LC Resonance Calculator](#)  
[LC Filter Design Tool](#)  
[MagLoop Calculator](#)  
[Morse Code World Trainer](#)  
[NTS Radiogram Portal](#)  
[Practical Antennas](#)  
[POTA app](#)  
[QSL Card Generator](#)  
[RF Z-Matching Calculator](#)  
[Toroid Inductance Calculator](#)  
[Toroids.info](#)  
[VSWR to Return Loss Calculator](#)  
[Ugly Balun Calculator](#)  
[Vail Morse](#)  
[Vband \(Ham Radio Solutions\)](#)  
[VOACAP Coverage Analysis](#)  
[Weather Underground](#)

– with assistance from  
Grant Porter, KG4SDR

