BEGINNERS CAROUSEL, INTERMEDIATE, AND ADVANCED CURRICULUMS

THE PATH TO MORSE CODE FLUENCY

STUDENT AND INSTRUCTOR GUIDE

VERSION 7.91

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LICW is committed to ensuring digital accessibility for people with disabilities. We strive to continually improve our curriculum, teaching methods, and training devices to enhance the user experience for all. This document has been optimized for screen readers used by the visually impaired.

LICW hosts a Hams with Disabilities Session with Chris VE3RWJ on the first Monday of the month at 7 PM Eastern in Zoom C. Members with any disability that affects learning or operating CW are encouraged to attend.

Members with hearing impairments may benefit from our revolutionary haptic device. Members may learn more here.

REVISION HIGHLIGHTS:

Version 7.91:

Guidance on when to repeat items in a QSO

How to use this guide

OverLearn Bootcamp Tiers

New Training Tools Section

Connecting Sending to Recognition

Collaboration with the QRQ Crew Club

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LIST OF ABBREVIATIONS:

ADV	Advanced
AGN	Again
ARRL	American Radio Relay League
BC	Beginners Carousel
BK	Break
CFP	Character Flow Proficiency
CQ	Calling any station
CW	Continuous Wave - synonymous with Morse Code
DX	Distance - synonymous with long distance station
FWPM	Farnsworth Words Per Minute
HST	High-Speed Telegraphy
IARU	International Amateur Radio Union
ICR	Instant Character Recognition
IER	Instant Error Recovery
IFR	Instant Flow Recovery
INT	Intermediate
IWR	Instant Word Recognition
LICW	Long Island CW Club
MAC	A family of desktop and laptop computers from Apple
MPP	The LICW Morse Practice Page
PC	Personal Computer
POTA	Parks On The Air
QRS	Send slower
QRQ	Send faster - synonymous with High-Speed Telegraphy
QSO	Communication with - synonymous with a contact
RR	Roger Roger - synonymous with understood
SKCC	Straight Key Century Club
SOTA	Summits On The Air
SST	Slow Speed contest
TTR	Time To Recognize
VET	Variable Effective Speed Training
VST	Variable Speed Training
WPM	Words Per Minute
WWII	World War Two

HOW TO USE THIS GUIDE:

- **Beginners (BC1–BC3):** Begin with the **Beginners Curriculum**, then review **Training Tools** (p. ~24).
- **Intermediate (INT1–INT3):** Review **Training Tools** (p. ~24), then proceed to the **Intermediate Curriculum** section.
- **Advanced (ADV1–ADV3):** Read the **Intermediate** section first, then the **Advanced** section (Advanced builds on Intermediate).
- **Instructors:** Please read - and be familiar with - the **entire guide**.

PREFACE:

LICW looked to the past for ways to improve its curriculum and teaching methods. Historical documents were carefully analyzed, with particular attention given to the 1936 study by Ludwig Koch[1] at the Technical University in Braunschweig, Germany, and the 1943 PhD thesis by Donald Taylor[2] at Harvard. This curriculum is a unique blend of proven vintage training methods, modernized with techniques and exercises refined through our collective teaching experience.

INTRODUCTION:

Welcome to LICW Academics. We are committed to helping you achieve your Morse code (CW) goals - from initial learning to conversational head copy and high-speed telegraphy. As you begin your CW journey, we recommend you adopt the following goals:

1. **Learn how to learn CW with the LICW method** - Understand and follow the LICW teaching approach to maximize your progress.
2. **Learn how to practice productively** - Productive practice means making measurable progress toward clearly defined learning objectives.
3. **Get on the air** – Preparing students to get on the air is the ultimate goal of the Beginners Carousel curriculum.

[1] L, Koch, Arbeitspsychologische Untersuchung der Tatigkeit bei der Aufnahme von Morsezeichen, zugleich ein neues Anlernverfahren fur Funker, A. angew.. Psychol., 50, 1936, 1-70.
[2] Taylor, D. W. (1943). Learning Telegraphic Code. Psychological Bulletin, 40(7), 461- 487.

4. **Learn how to make progress** - Continuously improve your speed, accuracy, and ease of recognition while advancing toward higher-level learning objectives.
5. **Have fun** - Enjoyment makes the CW journey rewarding, sustainable, and worth continuing.

OVERCOMING FEAR:

Many Morse code students encounter a psychological barrier rooted in fear - often the fear of being judged by others. This fear can block progress by keeping students out of the **growth zone**, where improvement only happens by working at the edge of one's ability.

Perfectionism makes this worse. Striving for flawless performance is counterproductive in learning CW. Telegraphy is not about perfection - even the best operators miss characters and words. These misses are not failures, but normal signals of progress and part of real-world communication.

The path forward is to **embrace vulnerability** and recognize that mistakes are an essential part of learning. LICW fosters a culture of respect, encouragement, and mutual support - creating the safe environment every learner needs to take risks, push limits, and grow toward fluency.

Instructor Notes: Helping Students Overcome Fear

- **Normalize mistakes.** Remind students that even expert operators miss characters - it's recovery and flow that matter.
- **Redirect self-criticism.** When a student apologizes or gets discouraged, reframe the miss as a natural part of learning.
- **Highlight progress, not perfection.** Call out what students are doing right - recognizing letters faster, staying in the stream, or showing persistence.
- **Model vulnerability.** Share your own early struggles. This helps students see that today's difficulties are common and temporary.
- **Promote community.** Encourage students to support each other. Hearing peers normalize challenges reduces the pressure of "going it alone."

HUMAN PERFORMANCE IN MORSE CODE ACQUISITION:

Not all students learn Morse code at the same pace - and that's expected. Differences in performance are rooted in three main factors:

- **Aptitude** - each learner's natural ability to process sound patterns.
- **Practice** - short, frequent, and focused sessions are far more effective than long, unfocused marathons.
- **Motivation** - persistence and patience matter more than raw talent.

Research shows that students can require anywhere from **18 to 110 hours** to reach the same proficiency level. The range is wide, but the outcome is the same: **everyone who sticks with consistent, smart practice succeeds.**

What Students Need to Know

- Progress does **not** move in a straight line. Expect **plateaus and sudden leaps.** Feeling "stuck" is normal and temporary.
- **Mistakes are part of learning.** The real skill is Instant Flow Recovery (IFR) - letting go of a miss and staying in the stream of code.
- Success in other areas of life doesn't guarantee speed in learning Morse code. This is a **new skill**, and everyone starts fresh.

Guidance for Instructors

- Normalize differences in pace. Reassure students that variation is expected.
- Reinforce that **fluency is built through flow, not perfection.**
- Highlight that practice quality and mindset are within the learner's control - and make the greatest difference over time.
- Encourage patience: every student is on a **valid path**, regardless of speed.

Key Takeaway: With steady effort, patience, and OverLearn principles, all students can achieve conversational fluency in Morse code. Go deeper by reading the LICW Position Paper on Human Performance in Morse code Acquisition.

ACADEMIC FLOW:

The following chart represents the LICW Academic Flow and typical progression from beginner to advanced levels of proficiency.

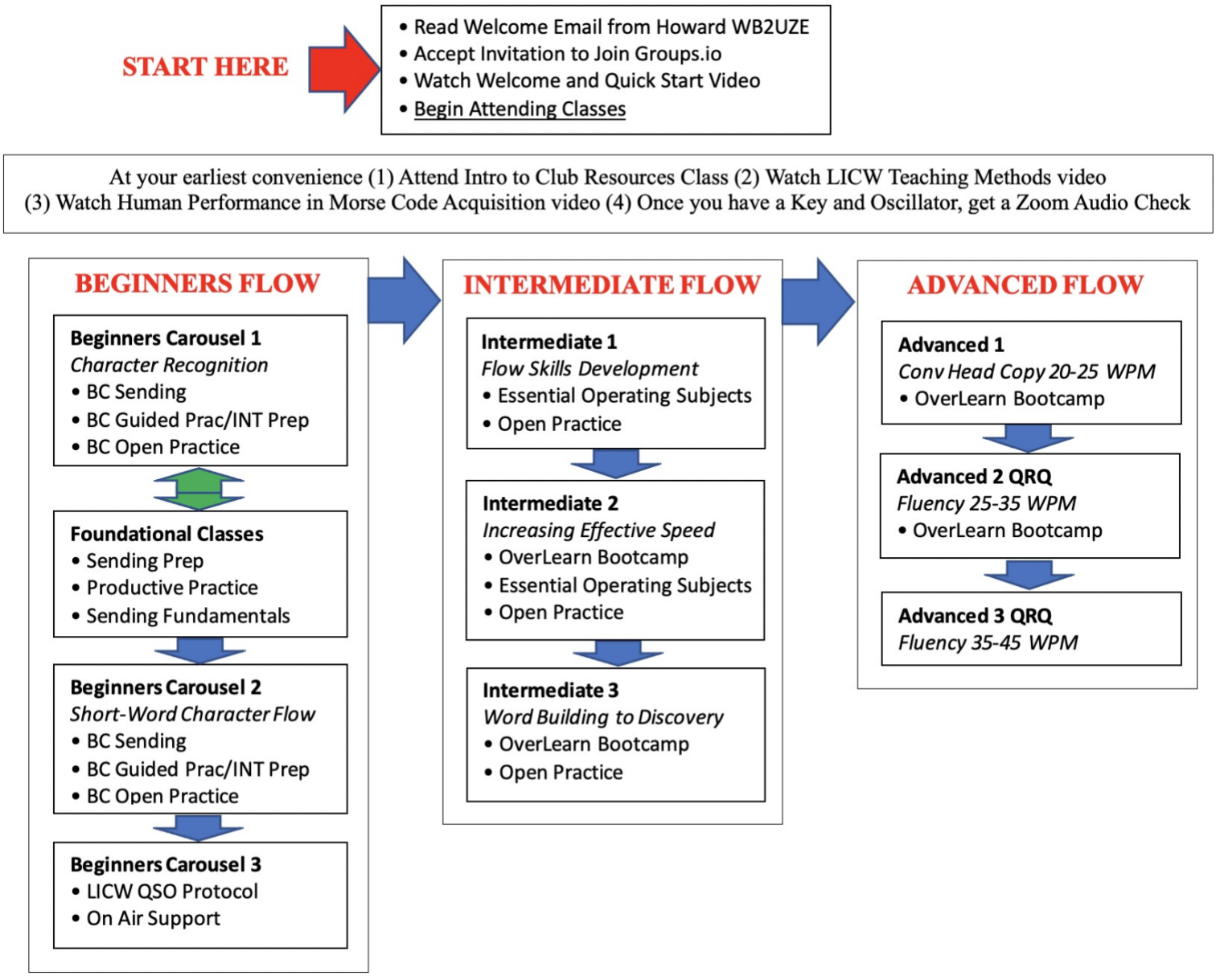

Figure 1 LICW Academic Flow and Progression

BEGINNERS CURRICULUM - THE LICW METHOD:

The central theme of the Koch report is that Morse code should be learned as **complete acoustic patterns**, not by visual reference to a printed chart.

Koch explored various methods to help new students internalize sound patterns and rhythm. In one experiment, students listened to code **without being told which characters the sounds represented**. Instead, they were instructed to mark a sheet of paper with a dot each time they recognized a recurring acoustic shape. This exercise linked the rhythm of what they heard with the rhythm of the writing hand, reinforcing the natural flow of code. This technique has been incorporated into the LICW *Beginners Carousel Curriculum*.

Koch also conducted sending and receiving experiments to determine the **optimal character speed** for learning. He found that speeds below 10 WPM prevented students from perceiving characters as complete patterns. While his ultimate goal was 20 WPM proficiency, his method began with establishing initial proficiency at 12 WPM, then gradually increasing to 20 WPM. LICW follows this recommendation - starting at 12 WPM in the *Beginners Carousel Curriculum* and advancing from 12 to 20 WPM in the *Intermediate Curriculum*.

In addition, Koch offered guidance on the **sequence in which characters should be introduced**. Following his principles, LICW developed a sequence based on the frequency of character use in standard QSO protocol. Characters that occur more often are introduced earlier, allowing students to naturally integrate QSO abbreviations and procedural elements into their training from the outset.

CURRICULUM OVERVIEW:

The *Beginners Curriculum* is organized into three carousels, culminating in the goal of getting on the air. There is no fixed entry point and no reset - students may join a carousel at any time and advance when they feel ready.

The carousel format accommodates a wide range of learning speeds and styles. Faster learners may complete a single rotation before moving on, while those who prefer a more gradual pace may take multiple rotations to reinforce their skills before progressing. This flexible structure ensures that every student can advance at a pace that supports both confidence and competence.

BEGINNERS CAROUSEL 1:

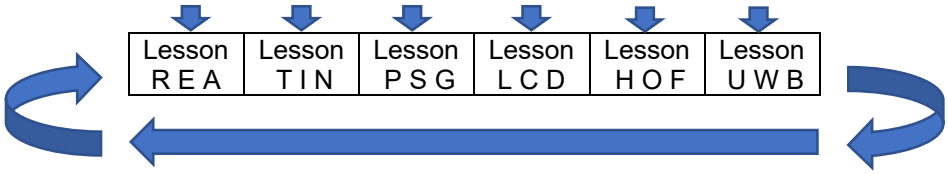

Figure 3 Beginners Carousel 1

BC1 consists of **18 characters** taught in **six lessons**, with the broad objective of ***learning how to learn CW using the LICW Method while developing character recognition***. The emphasis is on developing the ability to hear and instantly associate CW acoustic patterns with their corresponding characters.

Training begins at a **character speed of 12 WPM** with an **effective Farnsworth speed of 8 WPM** (*12/8*). Each lesson introduces **three new characters** using the **Koch[3] Method**.

When a new character is introduced, it is played **without revealing its identity**. Students mark a dot on paper each time they recognize that acoustic pattern. This reinforces the idea of hearing the character as a **single, complete sound unit** rather than as a sequence of dits and dahs.

Only after this recognition step is the sound linked to its corresponding character. From then on, students respond by **saying, writing, or typing** the character upon hearing it. This process is repeated for each new character in the lesson.

After all new characters have been introduced, students practice sending them on a **straight key** or by **verbalizing them to the instructor**. This

[3] Koch, *op. cit.*

ensures the characters are being recognized, recalled, and reproduced as **distinct, complete acoustic patterns**.

CODE TALKING:

Code Talking is a simple yet powerful way to stay immersed in Morse code throughout the day. By verbalizing characters, you can practice without the need for a key, oscillator, or any special equipment. It was introduced to LICW by **Chris Rutkowski**[4]**, NW6V**.

The method uses only three sounds: **"di," "DAH," and "dit."**

- **"di"** and **"DAH"** correspond directly to the character elements.
- The **final dot** in a character is verbalized as **"dit."**
- **Capitalized "DAH"** indicates emphasis.

For example:

R	. _ .	"di-DAH-dit"
E	.	"dit"
A	. _	"di-DAH"

Because Code Talking uses acoustic patterns aligned with actual Morse code, it is easy to integrate into early learning. However, it is intended as a **bridge** to actual sending and receiving with a key.

One of its greatest strengths is portability - you can practice anywhere. Reading billboards, traffic signs, or license plates **as if they were sent in code** keeps your mind actively engaged. Even short bursts of practice - while walking, driving, or waiting in line - help strengthen character recognition, reinforce rhythm and spacing patterns, and build reflexive decoding skills. Over time, these habits make Morse code feel natural and automatic.

[4] Rutkowski, C (2023). The CW Way of Life.

CHARACTER FAMILIARIZATION:

Character sound familiarity is the foundation of accurate recognition. At LICW, our approach is to **focus on familiarity first** - for as long as it takes - with the understanding that accuracy and speed will naturally follow. This is a gradual, relaxed process built on repeated exposure, deliberate practice, and reinforcement.

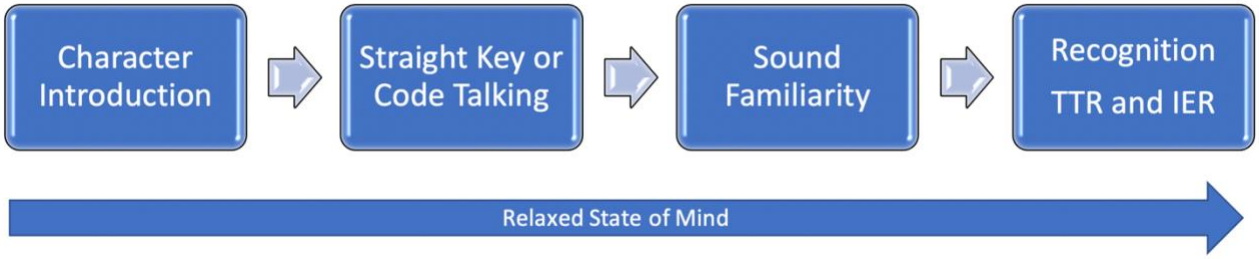

Figure 4 Character Familiarity Model

In each lesson, **three new characters** are introduced using the **Koch Method** in a calm, unhurried manner. After introduction, students send the new characters on a **straight key** or verbalize them using **Code Talking** for the instructor. This ensures they are being recognized as **single, complete acoustic patterns** rather than constructed sequences of dits and dahs.

Following this, the instructor leads **character sound familiarity exercises** to reinforce the new sounds. This concludes the first portion of the class. At home, students continue character sound familiarity practice until they achieve strong confidence in recognizing the new character sounds. Only then should they transition to **character recognition exercises** such as *MPP - Recognition*, *Groups of 3*, *TTR*, and *Variable Speed*, shifting focus toward accuracy and speed.

A **relaxed state of mind** with **loose focus** greatly enhances the learning process. This mindset allows new characters to be absorbed more easily, reduces mental fatigue, and promotes longer periods of effortless copy.

Note: In their **first BC1 lesson**, students are encouraged to focus exclusively on the new characters introduced in the first portion of class. Their homework for the week is to become **intimately familiar** with the sounds of those characters. While they may stay for the second half of the

lesson, doing so may be counterproductive since it reviews characters they have not yet learned.

SENDING:

Sending is not just a mechanical skill but a foundational part of the path to Morse code fluency. Disciplined sending develops rhythm, spacing, and tempo, which in turn strengthen perception on the receiving side. Project OverLearn integrates sending across all stages of training, breaking classes into tiers that align directly with enabling objectives on the path to fluency.

ZOOM AUDIO CHECKS (BC1 & BC SENDING BASICS):

The default Zoom audio configuration prevents a student's CW sidetone from being heard in class. Attempting to fix this in class is disruptive and negatively affects the learning experience for everyone. The purpose of Zoom Audio Checks is to verify that new students can be heard clearly before class begins, allowing instruction to start on time and reducing the need for mid-class troubleshooting.

Zoom Audio Checks are conducted immediately before BC1 and BC Sending Basics classes. Once students have their keys and oscillators - or sidetone from their HF rig - they should join BC1 or BC Sending Basics 15 minutes early for a quick audio evaluation. Instructors will be available to confirm that sidetone, keyer input, microphone routing, and audio levels are correctly configured, and to help make adjustments as needed.

Note on Prime-Time Classes

Due to extremely high attendance and overlapping Zoom usage, **some prime-time BC1 classes may not be able to offer a Zoom Audio Check**. In particular, the **Monday 8:00 PM ET BC1** class *does not* have an Audio Check session. Students attending that class are encouraged to join a Zoom Audio Check before any earlier BC1 or BC Sending Basics class during the week.

Once a student's audio has been set up successfully, the process normally does not need to be repeated unless equipment changes. Early audio

verification builds confidence, improves class flow for everyone, and ensures the session is spent learning Morse, not fixing Zoom.

BC SENDING BASICS:

BC Sending Basics is for students just starting their CW journey. Instruction begins with key adjustments and proper hand placement to promote comfort, control, and endurance. The straight key is the preferred tool at this stage because its simple ON/OFF operation mirrors the actual signal structure of Morse code, making it the most direct and intuitive starting point.

An essential feature of BC Sending Basics is practicing against a standard so that errors are not repeated and reinforced. The LICW Morse Practice Page (MPP) is used for this purpose, with instructors guiding students through a simple pattern: **hear a letter → say a letter → send a letter.** Real-time feedback helps students form dits and dahs cleanly, maintain correct spacing, and develop consistent rhythm.

Instructors provide continual feedback on element and character formation and spacing so that what students send matches what they hear. This process cements each character's **acoustic shape** for instant recognition. As consistency emerges, students progress naturally from single characters to words and short phrases, reinforcing the sound-symbol-motor connection that supports both sending and receiving.

BC - INT1 SENDING:

BC–INT1 Sending is designed for students who have completed the character set and are continuing their CW journey after learning all 44 characters. The emphasis here shifts from isolated characters to **smooth, rhythmic sending of words and short phrases** at 12 WPM.

This class develops the confidence and rhythm that make sending feel conversational rather than mechanical. Students practice common words and short phrases in real time, focusing on maintaining flow, recovering cleanly from mistakes, and sending with even pacing. The steady rhythm and controlled speed of BC–INT1 Sending provide the ideal bridge into the Intermediate curriculum, where Flow Skills Development becomes the central objective.

BEGINNERS CAROUSEL 2:

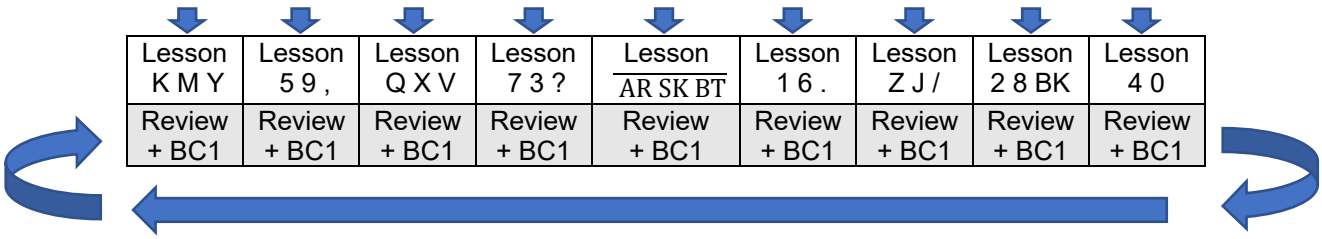

Figure 5 Beginners Carousel 2

BC2 expands the character set to **26 new characters** taught in **nine lessons**, including numbers, prosigns, and *BK*, bringing the total learned to **44 characters**. The broad objective of BC2 is to help students learn **how to practice productively while developing short-word character flow**.

Character speed remains at **12 WPM**, while effective speed increases to **10 FWPM** (*12/10*). Based on Koch's findings, once students have learned how to recognize Morse code as complete acoustic patterns, it is no longer necessary to introduce new characters without revealing their identity. This allows for a more direct introduction process.

The new characters learned in BC2, combined with the 18 carried forward from BC1, enable students to begin forming common **QSO words and phrases**. This marks a key transition from isolated character recognition to multiple character flow.

BC GUIDED PRACTICE/INTERMEDIATE PREP:

CLASS STRUCTURE & FLOW

BC GP/INT Prep classes are held immediately after each BC2 class, and both BC1 and BC2 students are encouraged to attend. These classes provide real-time instructor feedback, peer encouragement, and collaborative learning - factors that accelerate progress and cement the skills developed in BC classes.

The first half of each class is focused on reinforcing the day's BC lesson through structured repetition, improving sound familiarity and character recognition.

The second half transitions to Intermediate Preparation, emphasizing multi-character (2 to 4 letter) flow exercises that expand comfort zones, strengthen flow, and cultivate short-word Character Flow Proficiency (CFP). Students will be challenged to sustain rhythm, anticipate upcoming characters, and recover instantly from misses - the same skills that define a confident transition into the Intermediate curriculum, where longer word sequences become the norm.

The Intermediate Preparation portion should look and feel as close to an INT1 class as possible. The goal is to acclimate students to the structure, pace, and interactive environment they will experience as they advance.

ATTENDANCE EXPECTATIONS

As students progress through the final six lessons of BC2, attendance at BC GP/INT Prep shifts from a recommendation to **an expectation**. It is not necessary for them to attend the class immediately following their BC2 class, but at least one class per week is expected during this phase.

BC OPEN PRACTICE:

BC Open Practice sessions are held each weekday and are open to both **BC1 and BC2** students. Unlike **Guided Practice**, which is instructor-led and aligned with the curriculum, **Open Practice** is entirely student-led. This gives participants the freedom to set the pace, choose the focus, and experiment with different approaches.

The atmosphere is **relaxed and social**, offering a low-pressure environment where students can apply skills outside of class. While there is no formal structure, many groups choose to model their sessions after Guided Practice - using simple exchanges, QSO-style interactions, and informal sending drills.

These sessions are also a great way to **connect with peers** who are facing similar challenges. Students often share tips, discuss progress, and troubleshoot difficulties together in a collaborative spirit.

Guided Practice and Open Practice work best together: Guided Practice helps you strengthen class skills with structure, while Open Practice gives you a relaxed space to experiment and learn with others. Students who join both usually make faster progress, build confidence, and have more fun along the way.

BEGINNERS CAROUSEL 3: PREPARING FOR ON-AIR OPERATING

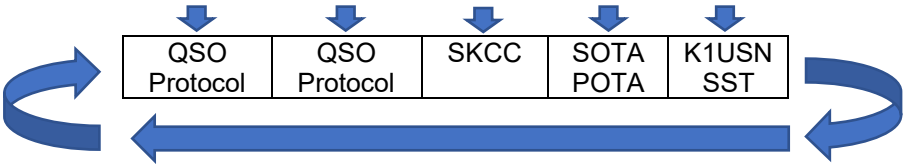

Figure 6 Beginners Carousel 3

BC3 is the culminating stage of the Beginners Carousel curriculum. It consists of five preparatory lessons designed to build the competence, confidence, and readiness needed for real-world on-air operating.

Like BC1 and BC2, BC3 has no fixed entry point and no reset - students may join at any time and progress when ready. Students do not need to wait until completing BC2 to begin BC3; they are encouraged to join as soon as they feel ready to start preparing for live operating.

Each lesson begins with a short briefing, followed by guided, interactive practice of the associated exchange type:

- **LICW QSO Protocol (Lesson 1)**
- **LICW QSO Protocol (Lesson 2)**
- **SKCC**
- **SOTA/POTA** (*Summits on the Air* / *Parks on the Air*)
- **K1USN SST** (*Slow Speed Contest*)

Our Goal: Prepare Students to Get on the Air

The ultimate goal of the Beginners Carousel curriculum is to **prepare students to get on the air - and to succeed when they do**. A first on-air QSO is a meaningful milestone and should be celebrated, but it is also deeply personal. Students retain full agency over when they take that step, and there is no expectation to “go live” by a certain time or in a certain way.

When students do begin operating, on-air experience accelerates learning through real-world exposure. Operating in real conditions helps students learn to:

- Accept missed characters without losing focus (a key fluency skill)
- Build confidence through repeated experience
- Adapt to real variables: band conditions, different fists and key types, and changing speeds

Being on the air is rewarding. It connects you to radio history, develops adaptability, and validates hard-earned skills. Instructors encourage on-air activity and support students whenever natural opportunities arise.

ON-AIR SUPPORT:

LICW hosts the K1USN SST (*Slow Speed Contest*) class on Sundays at 7 PM ET. This is a relaxed on-air activity ideal for first QSOs.

LICW QSO PROTOCOL CLASS:

LICW developed its QSO Protocol class to teach the **proper conduct of QSOs** outside tightly scripted contest exchanges.

QSOs can be:

- **Short and functional**, exchanging only basic information.
- **Longer "rag chews"**, with friendly, open-ended discussion.

The QSO protocol is deeply rooted in tradition. From calling or answering a CQ to properly and cordially closing, this class equips students to sound like experienced operators.

Once familiar with the QSO protocol, students are encouraged to attend **Recorded QSO Copy Class** with **Bob, WO6W**, on Thursdays. These sessions involve decoding and reviewing real recorded QSOs, sharpening the ability to understand varied fists and authentic radio conditions.

THE STRAIGHT KEY CENTURY CLUB:

The **Straight Key Century Club** is dedicated to promoting and preserving the art of mechanical key CW operation, including **straight keys, side-swipers (cooties), and bugs**.

Membership in SKCC is **free**, and all LICW students are encouraged to join and obtain an SKCC number: www.skccgroup.com

SKCC organizes monthly and special events ideally suited for new CW operators. LICW and SKCC collaborate on initiatives to help students get - and stay - active on the air with their mechanical keys.

LICW hosts an SKCC assistance class on Wednesdays at noon ET to give students an overview of the SKCC and answer questions.

MORSE CODE THEORY:

This graphic designed by Michael Maynard[5] K4ICY depicts properly spaced Morse code timing.

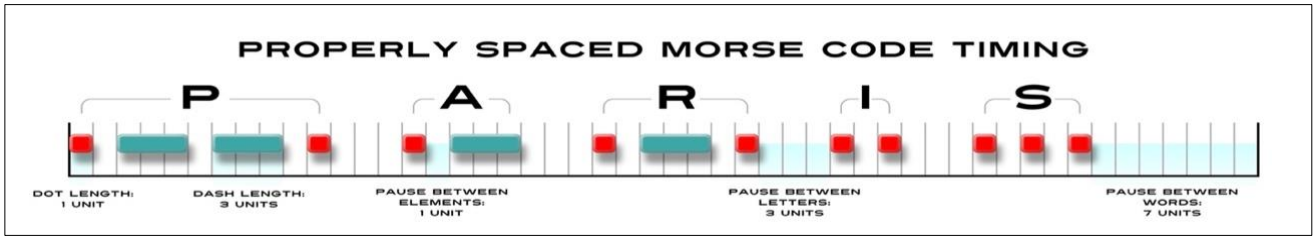

Figure 7 Properly Spaced Morse Code Timing

The following Morse Code standard, codified by the ITU, and recommended by ARRL and LICW is:

- A single dot is one unit.
- A dash is a period of three units.
- One unit separates each element (dot or dash) within a character.
- Three units separates each character within a word.
- Seven units separates each word.

[5] Maynard, M. A., 2022. *Home – K4ICY* - properly spaced Morse code timing. [online] Available at: < http://www.k4icy.com/cw.html > [Accessed 4 August 2022].

Spacing is one of the critical skills necessary to transmit intelligible CW. Often characters or words that are run together become meaningless. As our instructor John W2JSJ says “send the spaces.”

CODE BUDDY:

Jay NK2Y (nk2y@hvcdx.org) administers the **KN6EY Memorial Code Buddy Program**. Students wishing to participate can find program information in the club Dropbox. A signup form is also available through the link in the **Club Resources** section of the class schedules. Please direct any questions about the program to Jay.

We strongly encourage our students to connect with a Code Buddy. Practicing with another person adds motivation, accountability, and mutual support - all of which can meaningfully accelerate progress. Code Buddy practice can take place on Zoom, VBand, or on the air, depending on your goals and equipment.

Where to find a Code Buddy

Beginners Carousel classes and practice sessions - both Guided and Open - are excellent places to meet like-minded operators. Look for someone whose goals, schedule, and commitment level are compatible with your own so you can build a consistent, productive practice routine.

A good Code Buddy relationship can help you stay engaged, push through plateaus, and make Morse code learning more enjoyable. Over time, it can become one of the most valuable parts of your training.

PRODUCTIVE PRACTICE:

Practice is more than simply “putting in time” - it’s about **making measurable progress** toward defined goals. That is the difference between ordinary practice and *productive* practice. To move forward, you must have **clear objectives**. Knowing the skills you are working to improve makes it easier to choose the exercises that will move you in the right direction.

Set **realistic goals and expectations**, focusing on just one to three skills in any given session. Include **sending** as at least **25% of total practice**

time. Choose a time and place that is free from distractions and approach your practice with **Loose Focus** (lean-back copy). Loose focus promotes more effortless copying, extends endurance, and reduces mental fatigue.

Avoid over-practice and recognize that **fatigue undermines learning**. According to Koch, the most effective single practice period is about **30 minutes**. Practicing **twice daily for 30 minutes** - once in the morning and once in the afternoon - produces the fastest results. Many modern learners find that **shorter sessions of about 15 minutes**, spread throughout the day, help prevent fatigue while maintaining momentum.

Rest and recovery are essential to the learning process. Sustainable progress requires pacing yourself to avoid burnout. Understand that progress is rarely linear - you may see steady gains at first, followed by periods where improvement seems to stall. Short regressions and learning plateaus are normal. The key is to **take the long view, stay consistent, and maintain productive practice habits**. Over time, these habits will lead you to your CW goals.

ADVERSE COPY:

Adverse copy refers to the ability to accurately copy Morse code **under real-world, imperfect conditions**. On the air, signals are rarely as clean as the computer-generated practice many students start with. Atmospheric noise, QRM, QSB, multipath distortion, frequency drift, chirps, buzzing, and a wide variety of sending styles - including fists with “swing” - are all part of everyday operating.

As Howard, WB2UZE, often reminds us: **adverse signals are not to be tuned past**. They represent an opportunity, not an obstacle - the kind of rewarding challenge that skilled telegraphers actively seek out. Those who develop comfort with adverse copy discover a tremendous expansion of their operating capability.

Adverse copy skills allow operators to:

- Copy weaker signals among stronger ones
- Maintain comprehension through fading and interference
- Understand fists that are rhythmic but imperfect
- Thrive in crowded contest or DX environments

By training under more demanding listening conditions, operators build resilience, confidence, and versatility - traits essential for proficient CW operation.

In short: **when you can copy the tough signals, every signal becomes easier.**

WHEN TO REPEAT ITEMS IN A QSO

Repeating is not “wasted time.” It’s how you prevent logging errors and keep a QSO moving smoothly - especially when signals are weak, there’s QRM/QRN, or the other operator is still building confidence.

The core principle is simple: **repeat what’s log-critical** and repeat **only as much as needed** to confirm copy. Do **not** repeat everything by default.

WHAT TO REPEAT (MOST OF THE TIME)

1) Callsigns - Early in the QSO, send their call **and** your call**.** If conditions are rough, send your call again**.** Near the end of the QSO, repeat **both calls** again so both logs are correct.

2) The Exchange Items - Repeat the items the other station is most likely writing down: RST, name, QTH, state/province (or whatever exchange is required). These are the most common sources of logging errors - especially when signals are weak or fading.

3) Critical Words in a Ragchew (when meaning matters). In a ragchew, certain words carry the meaning of the sentence: names, places, rig/antenna details, medical/holiday/travel context, the key “point” you’re making, etc. Difficult or unusual words **can be repeated** twice **to prevent misunderstanding - especially if they’re central to the message.**

Bottom line: **Nobody these days will object** if you repeat a few ragchew words that are important to the meaning.

WHEN TO REPEAT (SITUATIONAL TRIGGERS)

Repeat immediately when it’s needed:

- When they ask (AGN?, PSE AGN, “say again”)
- When you suspect partial copy (QSB, QRM, QRN, flutter)
- When you’re sending **numbers** (serials, grids, zones, ages, years)
- When the information is easy to miscopy (similar calls/characters, unfamiliar place names)
- When you believe your QSO buddy might miss something due to **conditions or skill level**

A practical habit: **Determine the other station’s skill level early** (from their sending quality, their pacing, and whether they ask for fills). That will guide how **rudimentary** (or not) your ragchew text should be. If they’re newer, keep sentences shorter, keep words familiar, and repeat key items without embarrassment.

Bottom line: If you’re unsure they got it, repeat **only the item in question** - not the whole paragraph.

BUSTED CALL (WHAT IT MEANS, AND HOW TO SAVE IT)

A callsign is considered **“busted”** when it is copied **incorrectly** - either in the moment (during the QSO) or discovered **after the fact** in a logbook. In other words, one station believes they are working *WB2UZE*, but writes down something else (or only a partial call), and the QSO is now at risk of being logged incorrectly.

Busted calls happen for normal reasons: **QSB**, **QRM/QRN**, flutter, weak signals, accents/fists, timing, or simply a station that is still developing copy skills. They are common - and easy to fix if you handle them correctly.

The right way to “save” a busted call

When a station has copied **part** of your call, repeating the full call over and over can *fail* - because the missing piece may keep dropping out, and they keep hearing the same partial again. The better technique is to:

1. **Send the full call once** (to anchor the correct answer)
2. **Send only the missing part** several times (so the gap gets filled)
3. **Send the full call once more** for confirmation

Example: If the other op copied WB2U and missed the suffix, send:

WB2UZE UZE UZE UZE WB2UZE BK

Example: If the other op copied WB2UZ and missed a single character (very common with QSB/low power), isolate it and "pound it" cleanly by sending:

WB2UZE E E E E E WB2UZE BK

This works because you're not forcing them to re-copy what they already have - you're delivering the exact missing element in the clearest possible way.

Bottom line: A busted call is simply a wrong or incomplete callsign copy. Don't panic. **Fill the missing piece**, then confirm the complete call.

WHAT NOT TO REPEAT

Avoid repeating long sentences and "fluff" (hard to copy and rarely log-critical), repeating the same item three or four times "just in case," or repeating everything you send (it slows the QSO and increases errors).

Bottom line: If the other station didn't ask, and you have no reason to suspect a miss, **keep moving**.

RECORDED QSO AND ADVERSE COPY CLASS:

In this class, students listen to and decode a variety of real on-air QSOs drawn from actual operating conditions. Each recording is reviewed and discussed to highlight differences in fists, rhythm, spacing, and operator style. Students gain firsthand experience with authentic signal environments, including QSB, QRM, noise, and other factors rarely found in computer-generated practice.

A dedicated portion of the class focuses on **adverse copy** - the essential skill of copying Morse under imperfect or challenging conditions. Through guided exercises and progressive exposure, students learn to maintain comprehension amid fading, interference, odd fists, and variable sending quality.

By working with real recordings rather than idealized audio, participants develop practical resilience and a much deeper understanding of how CW truly sounds on the air. This class is an excellent complement to structured

Morse training and a powerful way to build confidence, versatility, and readiness for real-world operating.

RECOMMENDED DAILY PRACTICE REGIMEN:

Refer to the BC MPP Guide for a recommended set of exercises for your daily CW practice sessions using the Morse Practice Page. Tutorial videos on exercise setup are available on LICW's Morse Practice Page Tutorials playlist.

COMPREHENSIVE LEARNING STRATEGY:

Productive practice is only one component of a comprehensive learning strategy. The following is a suggested optimum learning schedule:

- Attend one or two BC classes weekly
- Attend one BC Sending class weekly
- Practice at home daily
- Keep the mind immersed in Morse Code throughout the day
- Attend one or two BC Guided Practice/Intermediate Prep sessions weekly
- Attend two or more BC Open Practice sessions weekly
- Listen to real CW on the air. If you don't have a radio use webSDR.
- Attend Recorded QSO and Adverse Copy class with Bob WO6W Thu 6:00 PM ET

TRAINING TOOLS:

The following training tools are highly effective and endorsed by LICW:

THE LICW MORSE PRACTICE PAGE:

The ***LICW Morse Practice Page*** **(MPP)** is a web-based, cross-platform tool that works on any PC, Mac, tablet, or smartphone. Designed and developed by Randy KN4YRM, the MPP provides a flexible, accessible way to practice Morse code anywhere. Tom AB5TN continually refines the MPP and develops new content in support of the LICW curricula.

Exercises and configurations are tailored for **all LICW class levels**, from beginner to advanced, and are regularly updated to align with our evolving curriculum. This ensures that students always have access to relevant, targeted practice material that supports their current learning stage and goals.

The MPP serves as the **primary practice platform** for LICW, supporting both classroom instruction and self-directed study. Whether you are reinforcing new characters, refining your timing, or building conversational-speed fluency, the MPP provides the structure and consistency needed for effective, measurable progress.

MORSE PRACTICE PAGE ACCESSIBILITY

The **LICW Morse Practice Page (MPP)** has been optimized for **screen reader compatibility**, ensuring that visually impaired users can navigate and operate the platform effectively. In addition, it includes specialized functions to assist the **hearing impaired**, such as integration with our **haptic feedback device**, allowing users to *feel* Morse code vibrations as an alternative or supplement to audio.

These accessibility features ensure that the MPP remains an inclusive training tool, enabling all students - regardless of sensory limitations - to participate fully in learning and practicing Morse code.

CW MICROTOOLS

Quentin, K7DRQ, our Chief Instructor, has created a fantastic learning resource called *CW Microtools*. These are a set of lightweight tools aimed to help you in your sending and QSO practice. They can be used to find words and sentences to send when you only know a subset of Morse characters, and generate full QSO exchange scripts with your callsign and member number for LICW, SKCC, SST, and SOTA / POTA exchanges.

CW FLOW PRACTICE TOOLS:

CW Flow Practice Tools is a web-based, cross-platform tool that works on any PC, Mac, tablet, or smartphone. Designed and developed by LICW Instructor, Duane WA7PGE, the tools provide user-friendly practice exercises for students as they progress from recognition to fluency. The

tool set includes word and phrase exercises for recognition, word building, word discovery, and instant flow recovery. The tool set also includes CW eBooks and a callsign trainer. Each practice tool is easily configurable by the user to set an appropriate difficulty level.

MORSECODE.WORLD:

MorseCode.World is a free, web-based, cross-platform hub of Morse code tools and reference material developed and maintained by our friend, Dr. Stephen C. Phillips. It works on any PC, Mac, tablet, or smartphone, is accessible for screen-readers, and can be downloaded or installed as an app for offline use. The site is organized around **International Morse Code** (the modern standard) and **American / "Railroad" Morse** and is designed to be useful whether you're just curious, learning from scratch, or trying to improve proficiency.

It includes a well-known **translator** (text ↔ dots/dashes, with audio/light/vibration options), an expanding set of **flexible training tools** (including LICW exercises), a **keyer/sounder**, and **decoder experiments**. There are also solid interactive reference pages on the code itself and timing, along with an FAQ and some **historical/interest pages**.

MORSE CODE NINJA:

Our friend Kurt, AD0WE, is widely known as the *Morse Code Ninja*. His website is one of the most comprehensive repositories of CW training resources available, featuring:

- Software
- Interactive Online Training
- On-Air Practice
- Hardware Recommendations
- Books
- Instruction and Advice

LICW and Kurt collaborate on several initiatives designed to help students **learn Morse code more efficiently** and **increase proficiency** through structured, high-quality practice. An **LICW tab** on the *Morse Code Ninja* homepage links directly to lessons aligned with the LICW curricula.

All Ninja lessons are **closed captioned**, reflecting our joint commitment to **accessibility** and ensuring that people with disabilities have full access to the training materials.

INTERMEDIATE CURRICULUM:

CURRICULUM OVERVIEW:

The Intermediate curriculum bridges the gap between **basic character recognition** and **advanced conversational fluency**. At this stage, students learn to process Morse code as flowing language rather than isolated characters. They build resilience, develop intuitive recognition, and begin to experience code as communication rather than as a decoding exercise.

Students typically enter **Intermediate 1** proficient at **12 WPM** with an on-air presence from BC3**.** By the end of the Intermediate program, they are expected to copy and send comfortably at **18-20 WPM**, preparing them for the Advanced curriculum.

The Intermediate curriculum consists of **three progressive levels**, each building systematically on the skills, habits, and flow developed in the previous stage.

ACHIEVING MORSE CODE FLUENCY: A FLOW-BASED MASTERY MODEL BY TOM WEAVER W0FN

The Challenge with Traditional CW Training:

Fluency in Morse Code (CW) is defined as **the comprehension of meaning while listening, combined with accurate, rhythmic, and speedy transmission.**

Traditional learning methods, which emphasize achieving high character recognition success (e.g., 75-85%) before increasing speed, create several critical limitations:

- **Recognition Delay:** The focus on **'Time To Recognize' (TTR)** individual characters in isolation postpones practice with natural, conversational character flows, essential for real-world fluency.

- **The Failure Mindset:** Students view non-recognition events ("misses") as failures, generating negative emotions and discouragement, crippling the

ability to move past errors.

- **Poor Flow Recovery:** This maximum recognition mindset severely delays the development of **Instant Flow Recovery (IFR)**, the crucial skill of ignoring non-recognition events and staying synchronized with the ongoing character flow. This prevents the necessary shift to higher-level processing.

The Path to Fluency - Three Essential Elements:

Our **Flow-Based Mastery Model** accelerates the path to fluency by focusing on exposure and flow over immediate, perfect recognition. This model requires a strategic shift built on three elements:

1. **Over-learning: Character Sound Units**

- **Strategy:** Over-learn each character not as a dit/dah sequence, but as a **unique, single acoustic sound unit** experienced *during* conversational character flows.

- **Result:** This dramatically shortens the **Time To Recognize (TTR)** a character. Progress is defined by TTR improvement gained through repeated exposure, not instant and/or expected perfection.

2. **Mindset Shift: From Decoding to Discovery**

- **Strategy:** Transition from slow, conscious **single character-by-character recognition** efforts to a relaxed, subliminal **"Word Discovery"** mindset.

- **Result:** The cognitive focus shifts to **"what word *is* being spelled"** rather than **"what *was* that dit/dah sequence."** This transition to faster, intuitive, and predictive and subliminal processing is key to 'getting the gist' and retaining meaning without needing to decode every element.

3. **Instant Flow Recovery (IFR): The Core Skill**

- **Strategy:** Develop the ability to 'keep up' and maintain synchronization with the ongoing CW flow, regardless of recognition success. Recognition is temporarily de-emphasized; instead, a relaxed, **"go-with-the-flow, try**

but don't care" attitude is adopted, emphasizing IFR skill development.

- **Result: IFR proficiency is the engine of TTR improvement.** It prevents the student from getting stuck on errors and allows the subconscious mind to build comfort levels, synchronize listening with the flow of CW, and process information quickly, leading to effortless, subconscious recognition.

LICW's Solution - Project OverLearn

Based on these insights, the Long Island CW Club (LICW) developed **Project OverLearn**. This system strategically accelerates the journey to fluency:

Core Mandate: Flow Over Perfection

Project OverLearn temporarily sets aside the high recognition success mandate. Instead, it focuses entirely on **over-learning character sounds during realistic, conversational character flows.**

Actionable Steps for Mastery

Focus Area	Technique & Mindset	Benefit
Exposure & Flow	Engage in **'Sound Surfing'** practice sessions: The goal is always **'keeping up'** and hearing every character sound, even when not fully recognized.	Builds **comfort levels** with common conversational speeds and mimics real-world CW experience (QSOs).
Attitude	Adopt an **'Alert Indifference', a "Try But Don't Care"** mindset. Remain mentally alert and interested in recognition while completely indifferent to misses.	Empowers **IFR** and nudges the slow, conscious mind out of the way, allowing the super-fast subconscious to take over character recognition duties.
Accelerated Flow-based Recognition	Practice word recognition *without* CW (e.g., verbal spelling). This can help train the mind in **flow-based word**	As CW character sound familiarity improves, recognition becomes a

	discovery independent of CW decoding difficulties.	**subliminal background process**, like the recognition of spoken letters.
Natural Progression	**Instant Word Recognition (IWR)** and **Instant Syllable Recognition (ISR)** (e.g., short often repeated sequences like CQ, THE, RST, ING, etc.) will morph into a single sound rhythm.	No need for specific IWR/ISR practice; focused flow practice and on-air QSOs create familiarity with these recurring letter sequences naturally and automatically.

Conclusion and Call to Action

Improving TTR is not a function of slow, meticulous character recognition of one character at a time; it is a function of improving **comfort and proficiency with conversational character flows** using IFR skills. Fluency is achieved as subliminal character recognition enables intuitive word discovery, retention of meaning, and **'getting the gist'** - comprehension without needing to capture every single word.

The **OverLearn Boot Camp** provides a quick, effective start to building this essential character sound familiarity and flow proficiency.

To accelerate your journey, I recommend:

1. **Prioritize Flow:** Listen to QSOs, practice with phrases, sentences, short stories, and have rag chews with a 'Code Buddy' during on-air QSOs. Focus on keeping up and hearing every sound.

2. **Community Support:** Join the **Long Island CW Club** for a welcoming community and very effective CW learning resources.

3. **Sustainability:** If practice feels more like work and less like fun, stop and resume later. Consistency powered by enjoyment is key.

THE PATH TO MORSE CODE FLUENCY CURRICULUM INTEGRATION:

1. Character Recognition (BC1 & BC2)

Objective: Ensure students master all 44 basic Morse characters — letters, numbers, and prosigns. Informed by Ludwig Koch's emphasis on learning Morse as "acoustic shapes."

2. Short-word Character Flow (BC2, BC Guided Practice)

Objective: Develop the ability to process sequences of characters fluidly — recognizing word patterns before full completion. This bridges foundational recognition to real-time comprehension and prepares students for Intermediate classes.

3. Flow Skills Development (INT1)

Objective: Develop intuitive processing of character sequences to enable communication beyond scripted exchanges (like the QSO Protocol). Focus areas include:

- Receiving conversational code in real-world context
- Developing well-paced, natural head sending
- Achieving "Loose Focus" and relaxed copy of short- to medium-length common words

4. Increasing Effective Speed (INT2)

Objective: Build cognitive efficiency rather than raw speed. Key components include:

- **Time To Recognize (TTR):** Reduce recognition time to lessen cognitive load.
- **Instant Flow Recovery (IFR):** Train to overlook minor misses and maintain rhythm.
- **Character Flow Proficiency:** Achieve seamless comprehension — shifting from decoding to effortless understanding.

5. Transition from Word Building to Word Discovery (INT3)

Objective: Shift from consciously constructing words to intuitively perceiving them. Students learn to anticipate and verify words using context, rhythm, and pattern recognition.

6. Cognitive Fluency (ADV)

Objective: Achieve conversational-level Morse fluency at 20+ WPM with effortless reception and transmission. Learners should engage naturally, sustaining comprehension and rhythm across extended exchanges.

LOOSE FOCUS AND ALERT INDIFFERENCE:

Maintaining focus long enough to copy a message accurately is difficult for several reasons. Distractions are common - it's easy to "fall off the rails" after missing a character, when the pace feels overwhelming, or when you begin consciously trying to interpret meaning mid-stream.

Ironically, one of the most common ways to lose focus is by trying *too hard*. While it takes concentration to follow the rapid stream of characters and retain what you hear, **over-concentration leads to mental fatigue**. That fatigue makes you more vulnerable to errors, hesitation, and frustration - especially when minor bumps in the copy occur.

The optimal mindset is something we call **loose focus** - a state of relaxed concentration. Think of Morse code as a *lean-back medium*, not a lean-forward task. Another term for this approach is **alert indifference**: staying mentally attentive, but emotionally detached. In this state, you can “go with the flow” even at higher speeds, without stressing over every character or word.

Importantly, **indifference does not mean apathy or lack of effort**. It means *trying without caring too much about the outcome*. At times, more focus may be needed, but that increased effort comes at a cost - it can drain mental capacity and reduce your ability to build words or retain meaning. The goal is to **apply only as much effort as the situation demands**, no more.

This approach leads to a steady, balanced style of copying - **controlled and sustainable**, with no need to celebrate successes or lament mistakes. Just flow, adjust, and keep moving forward.

TIME TO RECOGNIZE (TTR):

Instant Character Recognition (ICR) is being renamed **Time To Recognize (TTR)**. The term *Instant Character Recognition* implies recognition without delay, which is technically inaccurate. In reality, recognition always takes a measurable amount of time - even if very brief. This time varies based on the learner’s familiarity, the nature of the material (individual characters vs. words), and the depth of practice.

Through **OverLearning** - repeated, deliberate exposure and practice - we aim to **reduce** the time it takes to recognize what we hear, whether single characters, abbreviations, or words. To reflect this reality and our measurable training goals, we are adopting the more accurate term **Time To Recognize (TTR).**

TTR represents the time interval between the end of a Morse element (a character or word) and the moment of recognition. It captures the **essence of progress**: improvement is defined by reducing TTR through consistent practice and exposure. Unlike ICR, it does not imply instantaneous recognition or perfection - instead, it highlights steady, measurable improvement and the transition toward **automaticity**, when the sound is the character.

Guidance for Applying TTR WPM Equivalents

TTR WPM equivalents are provided as *reference points* to illustrate how recognition time typically shortens as proficiency develops. TTR should be viewed as a way to understand the gradual shift that occurs as practice builds familiarity and automaticity. The purpose is to help you **notice progress** - when copying begins to feel easier, smoother, and more effortless, your TTR is improving.

Think of the WPM equivalents as examples of how fluency unfolds with time and experience - a visual reminder that real progress is measured in **comfort, confidence, and flow**, not in numbers or speed.

		Inter-Character	***Inter-Word***
BC and INT1	12 WPM	0.300 seconds	0.700 seconds
INT2	16 WPM	0.225 seconds	0.525 seconds
INT3	20 WPM	0.180 seconds	0.420 seconds

INSTANT FLOW RECOVERY (IFR):

Misses are fine - they are a natural and inevitable part of copying Morse code at speed. The key is not trying to avoid them entirely, but to ignore them and continue with the flow - preventing the misses from stopping your momentum or causing you to focus backward.

Instant Flow Recovery emphasizes a deliberate mental shift: the conscious choice to ignore what was missed and continue in sync with the ongoing stream of characters and words. This skill prevents the “mental rewind” that causes learners to miss additional content while replaying errors in their head.

Rather than viewing a miss as a failure, IFR treats it as a small bump in a continuous journey. By continuing alert flow with no hiccup at all or within a fraction of a second, you optimize comprehension, maintain rhythm, and keep pace with the conversation. Over time, IFR becomes an automatic habit - the brain learns to drop misses instantly and continue to lean in and focus on the incoming flow.

In essence, IFR is forward-facing. It replaces the reactive mindset of *error correction* with the proactive mindset of *flow preservation*. The result is a smoother, more confident reception style that keeps you in the game and moving forward, without chasing an unattainable standard of perfection.

CHARACTER FLOW:

Character recognition is foundational - but not sufficient. Students often begin with isolated character drills, but this approach falters when characters and words arrive in rapid succession. To maintain comprehension at speed, students must also develop *flow skills* - the ability to process sequences of characters intuitively, recognize word patterns before the final character arrives, and attach meaning in real time.

CHARACTER FLOW PROFICIENCY:

Character Flow Proficiency refers to the ability to recognize and respond to a continuous stream of characters accurately and effortlessly, without pausing between letters or mentally decoding each one. It is characterized by:

- **Quick recognition** of each character as a single auditory unit (not dots and dashes).
- **Fluid transition** from one character to the next, without hesitation or cognitive lag.
- **Maintained rhythm** even as characters are sent in rapid succession.

- **Retention** of meaning or gist across multiple characters for word or phrase recognition.

Character Flow Proficiency is a foundational skill for developing head copy and achieving conversational-speed Morse code. It marks the transition from active decoding and character-by-character word construction to comprehension and fluency.

This shift in the consciousness of reception can occur in two ways:

(1) One approach involves having students rapidly process many characters and words, leading to mental exhaustion and eventual **capitulation -** the point where decoding each character is no longer sustainable. This fatigue forces them to shift from active and intense character-by-character decoding to a more intuitive understanding, similar to immersion training. This "brute force" technique uses exhaustion to push learners to stop consciously translating dits and dahs and start grasping words and meaning during character flow.
(2) A more effective approach to shift the mindset is a **conscious and well-structured transition** to a more passive and intuitive flow-based recognition process. The transition is facilitated by coaching from a qualified instructor experienced in these concepts, alongside a thoughtfully developed curriculum designed to move students beyond the slow and effortful character-by-character decoding. With appropriate encouragement, practice content organization, and character flow pacing, learners can systematically build character flow proficiency without the unpleasant and discouraging experience of cognitive overload forcing them to relinquish conscious control.

INCREASING EFFECTIVE SPEED:

Effective speed is not merely a function of hearing faster characters - it is the **result of cognitive efficiency**: how quickly and smoothly the brain can recognize characters, form words, and understand meaning without bottlenecks. Fundamentally, gains in effective speed emerge from three key developments:

(1) **Time To Recognize (TTR)**: As TTR improves, characters are recognized more quickly and with less effort. This frees up cognitive

resources, allowing the operator to focus on the *next character* or *emerging word* rather than getting stuck trying to decode the current one. A lower TTR leads to smoother, more fluid copying and opens the door to higher reception rates without overwhelm.

(2) **Instant Flow Recovery (IFR):** Misses are fine - they are a natural and inevitable part of copying Morse code at speed. The key is not trying to avoid them entirely, but to ignore them and continue with the flow - preventing the misses from stopping your momentum or causing you to focus backward.

(3) **Character Flow Proficiency:** Character Flow Proficiency refers to the ability to recognize and respond to a continuous stream of characters accurately and effortlessly, without pausing between letters or mentally decoding each one.

ANNOTATIVE VS. HEAD COPY:

Some students are not yet ready to focus entirely on head copy at this stage of their CW journey - and that's perfectly fine. Writing down what you copy in Intermediate classes is both normal and productive.

Head copy and writing are not mutually exclusive; they complement each other and are often used together. Writing is best suited for situations with little or no context, where accuracy is the top priority - such as traffic handling, callsigns, or signal reports. An experienced operator may jot down only a few critical details while head copying the rest of the exchange.

THE SPECTRUM OF FLUENCY:

Defining Fluency

In Morse code, fluency means being able to communicate effectively and naturally - to send, receive, and exchange information in a fluid, conversational manner. It does not require perfect automaticity or instantaneous recognition. A fluent operator can maintain flow, sustain rhythm, and convey or interpret meaning reliably, whether through active decoding, annotation, or intuitive comprehension. Fluency, at its core, is about enabling real communication - smoothly and confidently.

Fluency in Morse code develops along a continuum, not in sharply divided stages. As skills mature, operators move gradually from deliberate

decoding to effortless comprehension - from consciously assembling characters to simply understanding what they hear. Within this continuum, we often describe two general regions: Functional Fluency and Cognitive Fluency.

Functional Fluency

Functional Fluency is the ability to operate fluently in Morse code - to send, receive, and sustain copy with minimal hesitation or error - yet still through actively assembling words from individual letters or from annotation. This process demands focus and effort; the operator's attention remains anchored in decoding.

Like a non-native speaker who can converse smoothly but must still translate mentally, performance appears fluid, yet thought and meaning remain separate. The operator is fluent in execution, not yet in comprehension.

Importantly, Functional Fluency is a worthy goal and an achievement to be proud of. It enables competent and enjoyable CW operation in activities such as passing traffic, SOTA and POTA activations, contesting, and everyday rag chewing. For many operators, reaching this level represents a lifelong source of satisfaction and capability - a point where CW becomes both useful and deeply rewarding.

Cognitive Fluency

Cognitive Fluency marks the transition from active decoding to intuitive comprehension. Through overlearning of character flow, students internalize patterns so deeply that recognition becomes automatic, effortless, and without conscious control.

This reduction in cognitive load opens the path to natural understanding, where words are no longer constructed but discovered. Cognitive Fluency is what makes sustained copy at conversational speeds above 25 WPM both possible and enjoyable.

At this stage, the listener begins to experience the spontaneous emergence of meaning known as Word Discovery - when comprehension arises naturally from rhythm, context, and flow rather than from conscious decoding.

A Continuous Progression

Functional and Cognitive Fluency are best viewed not as two separate achievements, but as points along a continuous path of growth. Every operator occupies a different place on this spectrum, and progress is rarely linear. Over time, active and conscious decoding gives way to flow, and effort gives way to ease - the hallmark of true Morse fluency.

TRANSITION FROM WORD BUILDING TO WORD DISCOVERY:

Actively building words from individual letters demands intense focus and leads to fatigue. This method is not sustainable at moderate to high speeds. Overlearning character flow reduces this cognitive load by helping students move toward effortless comprehension by building high levels of Character Flow Proficiency.

Word discovery is the natural, intuitive emergence of words in the mind of the listener - not as a result of deliberate decoding and word building, but as a byproduct of staying relaxed, open, and receptive to the flow of sound. It reflects a cognitive state in which the operator is not consciously assembling characters, but instead *allowing* words to form, often in advance of the final letters being sent.

Rather than striving for instant word recognition or complete word-level sound templates, word discovery involves:

- **Anticipation**: based on rhythm, structure, and context, the listener develops a feel for what word is likely forming - even before it has fully arrived.
- **Relaxed verification**: instead of “figuring out” each word, the listener passively *notices* a likely word forming, and mentally checks whether it fits.
- **Receptive flow**: the brain is tuned to the *stream* of Morse rather than the individual dots and dashes, allowing meaning to surface with minimal effort.

This state is the opposite of active, effortful character-by-character construction. In fact, it requires letting go of the urge to decode and embracing a loose, trusting posture - similar to how we grasp meaning in spoken language: not by consciously parsing syllables, but by letting the mind fill in the blanks as it listens.

Word discovery is less about precision and more about probability and pattern recognition. The process feels effortless, yet highly effective - because the brain, when unburdened, is remarkably good at recognizing familiar language structures, even when they're incomplete or partially obscured.

OVERLEARN BOOTCAMP:

OverLearn Bootcamp is high-intensity and immersive training designed to accelerate students' progress. There are three tiers of Bootcamp, each aligned to key proficiency levels in the Intermediate and Advanced tracks.

Bootcamp emphasizes consistent, focused practice in both receiving and sending at higher speeds, with the goal of significantly reducing the time to recognize characters and enhancing character flow proficiency. Ultimately changing the conciseness of reception and moving students beyond conscious, slow, character-by-character decoding.

Through a structured regimen of drills and copying exercises, students develop the speed, accuracy, and mental endurance needed to operate at conversational speeds. The bootcamp environment fosters fun, peer support, and accountability, enabling students to accelerate their progress and break through plateaus quickly.

Unlike the flexible, self-paced format of LICW academic tracks, OverLearn Bootcamp demands a higher level of commitment. It includes prerequisites and requires twice-weekly attendance to live Zoom classes over a four-week period along with daily home practice sessions.

These standalone courses are designed to accelerate fluency through high-repetition drills, flow-based comprehension exercises, and structured exposure to rapid character and word sequences. Bootcamps are ideal for students seeking a focused path toward high-speed recognition and real-time understanding.

Bootcamp Tiers:

Tier 1 - Flow Foundations (supports transition into INT2)
Designed for students entering the “flow pressure” phase of learning - where the goal is to strengthen real-time character flow, improve recovery after misses, and reduce transcription dependence.

Tier 2 - Flow Builder (supports transition into INT3)
Designed for students who are making the jump to 20 WPM and beyond - where the goal is to sustain flow under higher speed pressure and build the mental mechanics of assembling characters into words in the mind.

Tier 3 – Flow Mastery (supports transition into ADV1)
Designed for students who can maintain flow at higher speeds and are ready to accelerate into true word discovery, higher-level comprehension, and cognitive fluency - the ability to copy conversational material with decreasing conscious effort.

Bootcamp Eligibility Requirements:

Bootcamp eligibility is tier-specific; however, all Bootcamps require students to have a solid foundation and the ability to participate in high-repetition drills without relying on scripts. At a minimum, participants must:

- Know the **44 BC Morse characters**
- Be able to express themselves on the air without relying on scripts such as the QSO Protocol or canned exchanges
- Demonstrate the ability to copy more than single characters (short-word character flow)

Class size is limited to 25 students to ensure an optimal student-to-instructor ratio and to provide each participant with personalized guidance and support. NOTE: Bootcamp Tiers are sequential. Enrollment requires completion of all prior tiers.

- Tier 2: must have completed Tier 1 *(or the “Original” Bootcamp, which satisfies Tier 1)*
- Tier 3: must have completed Tier 2 *(and therefore Tier 1/Original)*

For more details on Bootcamp goals, structure, and expectations, please refer to the What is Bootcamp document and the Bootcamp Student Guide.

OVERLEARN CAPSTONE EVENTS:

Consolidation, Mastery, and Endurance

Overlearn Capstone events bring Bootcamp graduates together in a supportive, high-energy environment to reinforce the habits, skills, and mindset they developed during their training. These sessions are intentionally light, fun, and celebratory, yet they remain rooted in the core principles of Project OverLearn: rapid recognition, seamless flow, instant recovery, and comfort at conversational speeds.

Above all, Capstone events are a celebration - a moment to honor each student's dedication, discipline, and progress. Capstone is where Bootcamp graduates recognize not only how far they have come, but how far they can now go. It marks the formal transition from intensive skill acquisition to the lifelong journey of CW operation and continuous improvement.

INT1 - INT2 SENDING:

INT1–INT2 Sending is intended for students who can already send comfortably at 12 WPM and want to progress further. The focus now shifts to **effective communication without reliance on a script,** building endurance, and raising effective speed toward 16 WPM.

Practice in these classes centers on **speed drills, QSOs, and ragchews.** Students move beyond short words and phrases, working on sustained sending that mirrors real-world exchanges. Mistakes are expected, but students are trained to correct smoothly and keep the rhythm intact. By practicing in realistic communication formats, students learn to hold the flow of a conversation while gradually expanding their speed range.

INT3 - ADV1 SENDING:

INT3–ADV1 Sending is for students who can already send comfortably at 16 WPM and want to advance naturally into the 20–25 WPM range. At this level, the goal is no longer simply accuracy, but **effortless, sustained head-sending** at conversational speeds.

Practice focuses on longer QSOs, ragchews, and speed drills that demand both endurance and natural rhythm. The emphasis is on sending with tempo and accuracy without breaking flow, creating a seamless link between sending and receiving at higher speeds.

At this stage, sending becomes truly fluent. Students begin to “speak Morse” directly through the key, building the confidence and rhythm needed for effortless communication in contests, on-air conversations, and beyond.

CONNECTING SENDING TO RECOGNITION:

Many students treat sending as a separate skill - useful for getting on the air, but not especially important for improving copy. In reality, sending can directly strengthen recognition when it is practiced the right way. When you hear a character or word and then send it immediately, you create an ear-brain-hand loop that reinforces the same patterns you need for fluent reception.

Think of this as linking acoustic patterns (what you hear) to motor patterns (what you do). Your hand learns the rhythm, your ear learns the rhythm, and over time your brain stops thinking about Morse and starts knowing it.

Why "Hear It, Send It" Works

When you hear a character and send it right away, you are doing three things at once:

- You hear the rhythm (the sound pattern)
- You produce the rhythm (the physical motion that creates that pattern)
- You confirm the rhythm (your ear validates what your hand produced).

That combination is powerful because it strengthens the sound-to-meaning link from multiple angles, not just one.

How Sending Reinforces the Three Pillars of Proficiency

1) **Time To Recognize (TTR) and the Acoustic-Motor Loop**

Connection: Sending a character is a physical performance of its rhythm. The hand motion that creates dit-dah patterns becomes associated with the sound pattern your brain must recognize instantly. When the sound and the motion repeatedly match, the brain builds a more reliable and faster pathway from sound to recognition.

Reinforcement: Practice sending at two speeds:

- Your comfortable, accurate speed
- And a second speed about 4 WPM faster

This helps prevent single-speed familiarity, where recognition only feels solid at one tempo. Instead, your brain learns the character's identity across different timing contexts - making recognition more flexible and faster.

Goal: TTR improves faster when your ear and hand agree on the character's rhythmic identity at more than one speed.

2) **Instant Flow Recovery (IFR) and Physical Resilience**

Connection: Good sending practice is not perfect sending practice. The best practice includes staying in motion even when you fumble - because that is exactly what fluent copying requires: stay in the stream.

Sending drills like the following require you to keep a steady cadence and keep moving forward:

- Sending the alphabet
- Sending numbers
- Sending 3-5 letter words

- Sending 5-7 letter words

Reinforcement: You are training your hand to treat a mistake as a non-event - recover instantly and continue. That same emotional neutrality (hits and misses are equals) is the foundation of IFR in reception.

Goal: A hand trained to keep flowing helps build a mind that keeps flowing.

3) Character Flow Proficiency and Rhythmic Signatures

Connection: Many common items in CW are not experienced as letters by proficient operators - they are experienced as rhythmic units.
When you send common words and patterns smoothly, you begin to internalize them as single rhythmic shapes, such as:

- THE, CQ, DE, TU, 5NN
- Common endings like -ING and -ED (as you encounter them)

Reinforcement: Sending these patterns as one connected motion helps your ear begin to hear them as one connected motion. That is the bridge from letter-by-letter decoding to chunking, prediction, and word discovery.

Goal: Sending supports the shift from analyzing characters to recognizing rhythmic signatures.

How to Practice This Effectively

Use the "Hear It, Send It" idea with a few simple rules:

1. No corrections. Do not backspace, restart, or fix anything. Treat sending errors like reception misses: keep going.
2. Prioritize flow over perfection. Your job is forward motion with good rhythm, not flawless output.
3. Keep the delay short enough to require focus. You should be slightly time-pressured - but not panicked.
4. Aim for smooth rhythm, not force. Light touch, relaxed wrist, consistent spacing.

5. Track progress by feel. The first sign of improvement is often that sending and copying both feel calmer and more automatic.

The Big Idea

Sending is not just an output skill. Done correctly, it becomes a recognition accelerator - because it ties the sound patterns you must recognize to the physical rhythms your body can reliably reproduce. Over time, this helps transform Morse from something you think through into something you simply know, with better TTR, stronger IFR, and more natural character flow.

If you adopt this mindset, sending practice stops being separate practice and becomes one of your most efficient tools for improving reception.

CLASS SCHEDULES:

To the extent feasible, Intermediate and Advanced classes are scheduled Monday through Friday at the same time to encourage the same group of students to attend. We have found the friendships and bonds formed in these classes create a unique and highly supportive learning environment we have dubbed the cohort effect. We have also designed significant overlap between each class level, and we encourage students to attend two levels at the same time. One class should be a comfort zone class and the other a stretch class which significantly challenges the student into their uncomfortable zone. Over time, the stretch class becomes the comfort zone and students' progress to the next level.

ESSENTIAL OPERATING SUBJECTS:

Essential Operating Subjects classes help students become better operators by broadening their CW knowledge and introducing them to a variety of CW activities and support resources. These sessions are taught by highly seasoned operators who share practical experience and insight.

Students are encouraged to start attending as soon as they enter the Intermediate curriculum. It may take several months of steady participation to experience the full range of topics, which include:

- *Am I Getting Out? Can You Hear Me?*
- Field Day
- Introduction to Contesting
- Logging Programs
- Portable Operations
- POTA (Parks on the Air)
- QRP Clubs
- QSLing in an Online World
- SKCC – SKED Page, Logger, Elmer Program, Events
- Spotting Programs
- WA7BNM Contest Calendar
- Weekly Contests – K1USN SST, MST, CWT

ADVANCED CURRICULUM:

CURRICULUM OVERVIEW:

The Advanced curriculum is the **culminating stage** of the LICW program, consisting of three progressive class levels designed to help students achieve Morse code fluency at increasingly higher speeds.

Fluency at this stage is defined not only by **speed**, but also by a **relaxed "word discovery" mindset**, where comprehension flows naturally. The focus shifts from perfect character-by-character copy to grasping the **meaning and gist** of the conversation. This approach develops endurance, resilience, and a natural conversational rhythm - even during extended, high-speed exchanges.

Students typically enter **Advanced 1** proficient at **18-20 WPM**. By this point, they can express themselves easily without relying on scripts, maintain a regular on-air presence, and participate confidently in a wide range of CW activities - from relaxed rag chewing to structured contest exchanges.

The Advanced curriculum builds directly on the **head copy** skills developed in the Intermediate program. Teaching methods and practice exercises carry forward, providing a familiar and comfortable learning environment while steadily increasing **speed, complexity, and conversational depth**.

The program also serves **experienced operators** who may have learned Morse code elsewhere and want to benefit from LICW's **structured, proven approach** to developing conversational head copy at high speeds.

QRQ (High-Speed Telegraphy)

Normal spoken language occurs at **110-150 words per minute**, while **20-25 WPM** represents a typical conversational Morse code speed. Many operators naturally aspire to go faster.

QRQ refers to Morse code operation **above 25 WPM**. While these speeds may appear daunting at first, with proper training, structured practice, and the right mindset, they are **well within reach**.

ADVANCED LEVELS:

Advanced 1

Proficiency Objective: Conversational head copy and sending at **20-25 WPM**

Focus: Strengthening flow, maintaining relaxed copy, and consolidating intermediate-level skills while building endurance at conversational speeds.

Advanced 2 (QRQ)

Proficiency Objective: Fluency at **25-35 WPM**

Focus: Expanding fluency beyond conversational pace, maintaining resilience under higher-speed exchanges, and deepening the word discovery mindset.

Advanced 3 (QRQ)

Proficiency Objective: Fluency at **35-45+ WPM**

Focus: Operating at high QRQ speeds with confidence, ease, and endurance - transforming Morse into a true **conversational medium** at its highest levels.

THE QRQ CREW CLUB:

The **QRQ Crew Club** exists to initiate Amateur Radio operators into the culture, practice, and techniques of **high-speed CW operation (35 WPM and above)** in a welcoming, non-judgmental community. It is a natural complement to LICW's Advanced curriculum by providing an on-air "next hill" and a community of operators who routinely operate above the speeds where many hams stop climbing.

QRQ Crew offers regular on-air activities (including **"QRQuesday" weekly activity nights**) that make it easier to find other faster-speed operators and build confidence through real QSOs. LICW students are encouraged to support QRQ Crew operating events - helping bridge the academic

environment with real-world operating opportunities and encouraging more on-air activity at higher speeds.

Membership in QRQ Crew is **free**, and LICW **Advanced 2 and 3** students are encouraged to explore and join: **www.qrqcrew.club**.

How to join: initiate a **35 WPM** CW QSO with a current QRQ Crew member (you may **QRS after initial contact**), then ask that member to recommend you for membership by emailing on your behalf. QRQ Crew promotes **manual CW sent by hand and copied by ear** (no keyboards/decoders) and allows straight keys, bugs, paddles, and cooties.

QRQ Crew members can be easily found using the **RBN Club Activity Spotter** (https://rbn.telegraphy.de/ and select **QRQ Crew** as a filter). QRQ Crew also publishes a membership roster on its website. An interested operator can use the roster plus RBN or HamAlert to find members for a QSO - whether for practice or for meeting the membership milestone.