

LICW ACADEMIC POSITIONS & RESEARCH

A Collection of Independent LICW Academic Papers

VERSION 5.0

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REVISION HIGHLIGHTS:

Version 5.0 establishes LICW Academic Positions & Research as the scholarly and instructional foundation supporting The LICW Method. The collection organizes LICW's academic positions into 29 independently maintainable papers covering historical research, auditory recognition, Continuous Flow, curriculum design, human performance, receiving objectives, instructional practices, and academic continuity.

Each paper identifies the academic question, states LICW's position, distinguishes research findings from instructional interpretation, and explains the implications for teaching. The collection preserves the historical contributions and limitations of foundational Morse research while documenting the reasoning behind LICW's contemporary, flow-based instructional approach.

Separating academic analysis from the Method Guide provides a lasting reference for instructors and curriculum developers, supports thoughtful evaluation of new ideas, and allows individual academic positions to evolve without compromising the coherence of the LICW Method.

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ABOUT THE ACADEMIC PAPERS

This collection brings together independently readable papers on questions central to the LICW Method. Every paper identifies an academic question, states the LICW position, describes the boundary of the evidence, and explains the instructional implications. Its research-and-rationale section develops the argument and preserves the detail needed for thoughtful review.

The papers are distinct from the Method Guide. The Method Guide defines the integrated instructional framework; these papers support it, challenge assumptions, preserve historical research context, and make individual questions available for further examination and revision.

PAPER IDENTIFICATION AND REVISION CONTROL

Each paper has a stable AP identifier and can be read, distributed, evaluated, and revised independently. The papers may address overlapping evidence and educational principles, but each presents its own academic question, position, evidence boundary, instructional implication, and supporting rationale. When a position changes, the related Method Guide and instructional materials should be reviewed for consistency.

This collection and its separately distributed papers provide academic analysis supporting The LICW Method. Questions of formal policy, publication approval, and organizational authority are governed by current LICW documents.

I. HISTORICAL AND PERCEPTUAL FOUNDATIONS

AP-01 THE HISTORICAL RESEARCH LINEAGE

Academic question • Which research traditions inform the LICW Method?

LICW POSITION

LICW regards its method as a contemporary instructional synthesis, not the invention of any single researcher. The telegraphy studies of Bryan and Harter, applied psychology investigations by Thurstone and Lipmann, Koch's auditory-reception work, Taylor's wartime research, Keller's teaching experiments, and more recent accounts of advanced Morse skill and comprehension each illuminate different parts of the learning process.

RESEARCH AND EVIDENCE BOUNDARY

This is historical interpretation, not a demonstration that any one modern LICW class format has been experimentally validated. The meaning and limitations of particular historical experiments must be preserved.

INSTRUCTIONAL IMPLICATION

Use original scholarship to ask better instructional questions, not to attach an authority's name to a technique without verifying what the author actually did.

RESEARCH AND RATIONALE

Wundt And The International Spread Of Experimental Psychology

Leipzig became an international center for the new experimental psychology. Scholars who studied or worked in Wundt's environment included G. Stanley Hall, James McKeen Cattell, Hugo Münsterberg, and Edward Bradford Titchener, among many others. Their later careers carried experimental psychology into universities and research traditions outside Germany. This should not be read as evidence that they all transmitted a single Wundtian theory. The more important historical point is that the laboratory methods and experimental culture developed at Leipzig spread widely and then branched into different schools of thought.

Bryan And Harter, 1897-1899: Telegraphy As A Science Of Skill

William Lowe Bryan and Noble Harter transformed telegraphy from an occupation that happened to require practice into a major psychological model of skilled performance. Harter's experience as a telegrapher allowed the

researchers to combine laboratory measurement with detailed observation and interviews of working operators. Their 1897 and 1899 papers became foundational studies of expertise and learning.

These studies also produced the famous discussion of learning plateaus. Bryan and Harter interpreted some plateaus as periods in which lower-order habits were being reorganized to support higher-order performance. Later researchers, especially Taylor, questioned whether such plateaus were universal. The disagreement is itself instructive: Morse research developed through testing and revision, not through a single unbroken consensus.

From Expertise To Selection: World War I And Applied Psychology

Lipmann's purpose was not to establish K M R S V as a beginner teaching sequence. The five signs formed a small sample of actual radiotelegraph learning used to evaluate aptitude under increasingly demanding conditions. His enduring contribution is the proposition that early performance on the task itself can provide information about later acquisition. Koch returned to that idea, and Taylor later tested the broader proposition directly.

Two German Streams Converge In Koch

At the same time, Koch was working inside a practical applied-psychology problem already explored by Lipmann and other psychotechnical researchers: how to select and train radio operators efficiently. That stream was concerned with aptitude, occupational performance, early task learning, and training efficiency. It intersected with, but should not be collapsed into, the Leipzig lineage of experimental and holistic psychology.

Harvard And The American Experimental Tradition

Harvard provides another intersection by which nineteenth-century experimental psychology reached wartime Morse research. William James developed an American experimental and functional tradition concerned with how mental processes operate in real life. That tradition was not simply an extension of Wundt, but Harvard also became directly connected to the German laboratory movement through psychologists trained in Leipzig.

Hugo Münsterberg earned his doctorate under Wundt and was later recruited by James to Harvard, where he helped strengthen experimental and applied psychology. A second academic line ran from Wundt to Edward Bradford Titchener and then to Edwin G. Boring. Boring became a dominant figure in Harvard experimental psychology and directed its Psychological Laboratory from 1924 to 1949. Donald W. Taylor's 1943 paper states that Boring served

as consultant during the experimental investigation and preparation of Taylor's Harvard dissertation research.

These relationships should not be exaggerated into a claim that Taylor simply inherited Wundt's, Münsterberg's, Titchener's, or Boring's theory. They establish something more defensible and historically useful: Taylor's work was conducted inside a mature experimental-psychology institution connected to both the American functional tradition and the international laboratory tradition that had grown out of nineteenth-century experimental psychology.

Donald W. Taylor, 1943: The Convergence Point

Taylor's importance lies in the fact that he did not begin with Koch alone. His 1943 review, Learning Telegraphic Code, opens by identifying Bryan and Harter's 1897 and 1899 studies as the beginning of the literature and then surveys decades of American and European work. His experimental paper, The Learning of Radiotelegraphic Code, used Harvard students preparing for possible wartime service and addressed practical problems of teaching and selection.

Taylor explicitly connected Lipmann and Koch when constructing his Initial Learning Test. Instead of copying Lipmann's or Koch's character order, Taylor used eight different characters during the first hour of training. His test achieved a reported reliability of .97 and a validity coefficient of .73 against later code achievement. The finding supported the predictive value of early learning performance while separating that principle from any particular sequence of characters.

Taylor also tested other inherited claims rather than simply accepting them. He instructed students to perceive characters as organized auditory patterns and avoided visual Morse symbols, but he did not find that faster initial character speed itself produced faster overall learning under his experimental conditions. He also concluded that plateaus were not a universal feature of code learning.

That combination of continuity and criticism is especially valuable to LICW. Taylor shows how historical research should be used: preserve a good question, reproduce or modify the procedure, test it under controlled conditions, and accept that some propositions will survive while others will not.

Koch Reaches The American Wartime Literature

Harold Peak's 1942 Psychological Bulletin note, Koch's Method of Learning Code Reception, helped bring Koch's German work into the English-language psychological literature just as the United States faced an urgent wartime demand for radio operators. Taylor's two major publications followed in 1943. The German and American streams were no longer merely parallel; they were now explicitly interacting.

Fred S. Keller And A Parallel Wartime Learning Tradition

Keller encouraged students to hear Morse signals as unitary patterns and maintained the same signal speed during initial learning. Unlike Koch's cumulative approach, in which unfamiliar characters were added gradually, Keller's "whole method" drew practice items from the full set of 36 basic Morse signals from the beginning. The signals were still presented and identified individually; the distinction was that Keller did not restrict early practice to a small, progressively expanding character set.

From Wartime Skill Research To Modern Morse Comprehension

These findings do not prescribe the LICW curriculum, but they strengthen a distinction already visible in the historical literature: accurate character recognition is necessary for many tasks, yet fluent language comprehension depends on more than recognition alone. This provides a modern bridge from Bryan and Harter's higher language habits to LICW's current work on Word Discovery, listening posture, Short-Term Retention, and conversational head copy.

From Scholarship To LICW Practice

Taylor: testing inherited claims rather than accepting them by authority supports LICW's evidence-led position that historical methods should be examined, adapted, and rejected where necessary.

AP-02 LUDWIG KOCH: CONTRIBUTION AND LIMITS

Academic question • Which parts of Koch's 1936 report does LICW adopt, and which attributions does it reject?

LICW POSITION

LICW adopts the idea of complete acoustic characters, avoidance of visual dot/dash translation, sound familiarity before identification, manageable introductions of new material, and an initial character speed around 12 WPM. LICW does not present modern two-character drills or the K M R S U sequence as universal rules established by Koch.

RESEARCH AND EVIDENCE BOUNDARY

Koch's initial paired condition and subsequent one-at-a-time additions are distinct procedures. The report is historically influential, but not every claim was experimentally controlled. The K M R S attribution is specifically contested by the source analysis.

INSTRUCTIONAL IMPLICATION

Teach Koch's enduring perceptual principles within LICW's continuous-entry system rather than copying an alleged "Koch Method" uncritically.

RESEARCH AND RATIONALE

Background

Koch did not begin the scientific study of Morse acquisition. By 1936, Bryan and Harter had studied telegraphic skill and automaticity, Thurstone and Lipmann had investigated training and aptitude, and German psychotechnical researchers had examined radio-operator selection and learning. Koch's importance lies in the way he synthesized several of those questions into a coherent prewar investigation of auditory reception and training.

The Historical Context

Koch's report was published in Germany in February 1936. That date is relevant to understanding the practical significance of his work. The Treaty of Versailles had sharply restricted German military capacity after World War I. By 1935, those restrictions were being openly repudiated as Germany reintroduced conscription, expanded the Army, and publicly acknowledged the Luftwaffe.

Avoiding Visual Morse During Initial Learning

This remains one of LICW's strongest guardrails: Morse code should initially be learned as sound, not sight. Charts, written dots and dashes, visual trees, and similar devices can reinforce analytical processing at the very stage when the student should be learning direct acoustic recognition.

Sound Familiarity Before Identification

LICW preserves this principle directly in BC1. Before identifying each new character, the instructor first plays it without telling students which letter it represents. Students listen for the recurring acoustic pattern and indicate when they recognize it. Only after familiarity begins to form is the corresponding letter identified and practiced.

Koch repeatedly described the desired result as an immediate relationship between the sound image and the letter without reflection. In modern instructional language, this points toward Automatic Character Recognition (ACR), not an assertion of literally zero recognition latency. Koch's historical description should not be confused with a modern measurement protocol.

Koch also recognized that the learner's capacity can be exceeded. New material must be introduced gradually enough that previously established sound-to-meaning relationships remain stable. This insight becomes especially important when evaluating what Koch actually said about beginning with two characters.

What Koch Actually Said About Two Characters

Koch did begin his procedure with two characters. His fixed-start training began with two well-differentiated sound patterns so the learner could hear distinct acoustic Gestalts, discriminate between them, and adapt to the rhythm without managing a large unfamiliar set. The letter identities were initially withheld and attached only after the sounds had become familiar.

The crucial point is what happened after the initial pair. Once those first sound-to-letter relationships were established, Koch added only one new character at a time and integrated it with known material. The initial pair therefore had a practical role at the fixed starting point, but the broader concern was scope of comprehension and stable sound-to-meaning relationships.

This became especially clear in a later practical experience in which two additional new letters were introduced simultaneously after students already knew a larger set. Koch reported that the added load disrupted not only

acquisition of the two new letters but also reception of characters that had previously been secure. Consolidation required substantially longer than when the new letters were introduced individually.

That later experience does not invalidate Koch's initial two-character start. It shows that the opening pair and later additions served different purposes: the pair established manageable acoustic discrimination and rhythm; thereafter, adding multiple unfamiliar characters at once could exceed capacity and destabilize recognition.

LICW takes the deeper principle to be controlled acquisition: establish the acoustic pattern first, form a secure sound-to-meaning relationship, and add unfamiliar material only as fast as the learner can absorb it without disturbing prior learning. Koch's fixed-start implementation need not be copied literally for those principles to remain useful.

From Lipmann'S K M R S To The Misattributed "Koch Sequence"

The familiar sequence beginning K M R S U is routinely called the "Koch sequence." That attribution is historically inaccurate. K M R S comes from Lipmann's 1919 aptitude work; a contemporary account lists his five signs as K, M, R, S, and V. Koch used more than one character progression, and none reproduced in his report begins K M R S U.

The historical point is simple: K M R S came from Lipmann. It was later incorrectly associated with Koch. Lipmann used the signs in aptitude research, not as a prescribed communication-driven beginner curriculum.

Donald Taylor's 1943 Initial Learning Test used eight different characters and validated the broader principle that early task learning can predict later achievement. Taylor did not validate K M R S U as an instructional sequence, and Koch's documented progressions do not establish it as his sequence.

The Two-Tone Experiment And Evidentiary Limits

More importantly, Koch had already established that some characters were more difficult than others and that their position in the sequence produced visible plateaus in learning. LICW's reconstruction of the character progressions raises substantial concern that the sequences used in the relevant comparisons were not equivalent in difficulty during the early portion of training.

That matters because the effect Koch highlights is precisely the faster early rise of the two-tone group. If one group encounters easier characters earlier

than another, a faster initial learning curve would be expected even if tonal treatment had no effect. This does not prove that two-tone training is ineffective. It means that the comparison does not convincingly isolate two-tone presentation as the cause of the reported advantage.

Research, Advocacy, And The LICW Reading

The early portions of Koch's report contain careful observations about acoustic perception, timing, Gestalt, and the transition from analytical decoding toward automatic recognition. These sections establish substantial credibility.

Later portions increasingly argue for the superiority of Koch's newly developed procedure and emphasize the extraordinary reduction in training time he believed it produced. There is nothing inherently improper about a researcher advocating a method that appears successful. But advocacy increases the importance of controls, disclosure, and consideration of alternative explanations.

AP-03 AUTOMATIC RECOGNITION AND CONTINUOUS FLOW

Academic question • What are the complementary foundations of LICW receiving instruction?

LICW POSITION

ACR and Continuous Flow are shared foundations of proficiency. ACR develops direct recognition of complete acoustic characters; Flow develops the capacity to remain with the sound in motion and recover when items are missed. Word Discovery may emerge as these skills become more dependable. TTR describes a potential diagnostic issue, not a formal target.

RESEARCH AND EVIDENCE BOUNDARY

Definitions of ACR, Flow, and Loose Focus articulate LICW's instructional framework. A practical timed response is not a pure physiological measure of recognition latency.

INSTRUCTIONAL IMPLICATION

Teach both direct recognition and forward continuity from the beginning. Evaluate the entire receiving task, including retention, response, and recovery, rather than isolated latency or perfection.

RESEARCH AND RATIONALE

Background

Morse code proficiency begins with recognizing complete acoustic patterns, but recognition alone does not fully describe the skill required for real-world operation. Morse is received as a continuous stream under real-time conditions. The operator must recognize what arrives, maintain continuity, and recover when individual elements are missed.

As students progress, this continuous engagement allows for the natural emergence of larger patterns, including words and phrases, without deliberate construction. This process is often described as word discovery.

Instructional Rationale

Instruction that emphasizes perfect accuracy, isolated recognition, or conscious decoding can interfere with this process. It encourages a stop-and-go approach that is not sustainable as speeds increase.

Instruction that emphasizes continuity, rhythm, and immediate recovery allows increasingly automatic acoustic recognition to support Flow. Students become less dependent on conscious decoding and more capable of using recognized information in real time.

Automatic Character Recognition (Acr) And Continuous Flow

Automatic Character Recognition (ACR) is the progressively learned ability to recognize a Morse character directly from its complete acoustic pattern, without consciously counting elements or reconstructing a dot/dash sequence. Automaticity is not an all-or-nothing threshold. It develops through practice, may differ among characters and operating conditions, and can become more reliable through OverLearn.

Continuous Flow is the ability to remain engaged with an arriving Morse stream rather than stopping to analyze or repair each recognition event. It requires forward continuity, appropriate short-term retention, and recovery when material is missed. ACR reduces the conscious work of recognition and helps support Flow, but accurate isolated recognition alone does not guarantee continuous reception. As proficiency develops, familiar words and other larger acoustic patterns may also be recognized with less deliberate assembly.

Time To Recognize (Ttr): A Diagnostic Concept, Not The Goal

Time To Recognize (TTR) describes the delay between completion of a recognizable acoustic unit and its recognition. It is a useful way to discuss recognition latency and cognitive drag, but is not itself a learning objective. Apparent response time in a practical exercise can also reflect attention, short-term memory, decision-making, typing, or writing; it should not be treated as a direct laboratory measurement of pure recognition latency.

LICW does not set a universal TTR threshold for Automatic Character Recognition. WPM equivalents and timed exercises may be helpful instructional illustrations or diagnostics, provided they are interpreted cautiously. The outcome we seek is increasingly reliable ACR within continuous Flow, with appropriate retention, comprehension, recording, and recovery for the operating task.

Loose Focus And Alert Indifference

Conversational flow is supported by what LICW calls Loose Focus: relaxed concentration that remains engaged with the signal without grasping at every individual sound. Loose Focus does not mean reduced attention. It means

using only as much conscious effort as the task requires so that attention remains available for rhythm, words, context, recovery, and meaning.

Alert Indifference is the complementary emotional posture. The operator remains alert for recognition but does not become emotionally attached to each successful “get” or each miss. A miss is noticed, released, and followed by immediate return to the stream. Alert Indifference is not apathy; it is disciplined non-reactivity.

Loose Focus and Alert Indifference support both conversational reception and Callsigns and Exact Copy. The operator changes listening posture according to the receiving objective—not by increasing strain, narrowing attention, or abandoning flow.

Relationship To The LICW Curriculum

At the Beginner level, it guides the emphasis on sound-first learning and early exposure to continuous input. At the Intermediate level, it supports sustained continuity, recovery, and the transition from characters to words.

At the Advanced level, it enables confident CW communication under increasingly natural conditions. For those who continue further, it supports the extension of that fluency into mastery under higher speed, greater density, and longer-duration operating conditions.

In all cases, the goal is the same: increasingly automatic recognition in continuing Flow, with the ability to remain in motion, recover from misses, and use what is heard according to the receiving objective.

AP-04 CHARACTER SPEED IN INITIAL LEARNING

Academic question • Why does LICW begin beginner instruction at approximately 12 WPM character speed?

LICW POSITION

LICW uses approximately 12 WPM character speed in the Beginners Carousel to protect the character's acoustic identity while remaining reasonably accessible to novices. Slowing individual characters until they fragment invites analytical decoding; pushing them beyond recognition capacity can be equally counterproductive.

RESEARCH AND EVIDENCE BOUNDARY

The historical choice follows LICW's reading of Koch's observations at roughly 50–60 characters per minute. It is an instructional starting point, not a universal neurological boundary or proof that 12 WPM is optimal for every individual.

INSTRUCTIONAL IMPLICATION

Maintain the sound-first purpose of speed selection. Do not raise speed merely to suppress counting or lower it reflexively to remove every difficulty.

RESEARCH AND RATIONALE

Historical Foundation: Koch's Findings

Ludwig Koch's 1936 study provides an important historical foundation for LICW's position on character speed. Koch examined how Morse code was perceived at different speeds and argued that the acoustic character of a Morse signal changes when it is sent too slowly.

In Koch's experiments, conventional character timing below approximately 50 characters per minute increasingly lost the Gestalt, or whole-pattern, quality he considered essential to auditory reception. In practical terms, the sound was more likely to break apart into separate elements rather than present itself as a unified acoustic object.

Koch treated approximately 50 characters per minute, or 10 WPM, as an important transition region in his observations. LICW does not treat that number as a hard physiological boundary. It is better understood as a historical indicator of the point at which excessively slow character formation begins to encourage analytical rather than whole-pattern perception.

Koch therefore chose 60 characters per minute, or approximately 12 WPM, as the initial learning speed. This was not arbitrary. It was fast enough to preserve the sound image of the character, but not so fast that the average student would be overwhelmed.

Koch also considered higher speeds, including 100 characters per minute, or approximately 20 WPM. While that speed more closely approached practical operating goals, it imposed too much cognitive demand on many beginners. Students with a high degree of aptitude could keep up, but many could not. Koch therefore rejected 20 WPM as the general starting point for initial learning and selected 12 WPM as the better instructional compromise.

This reasoning - rather than an assumption that every learner has an identical perceptual threshold - is the historical basis for LICW's use of 12 WPM character speed in the Beginners Carousel.

The Misunderstanding Of "Too Fast To Count"

A common argument for very high character speed is that students should be forced to stop counting dits and dahs. The intention is sound, but the formulation is incomplete.

If character speed is increased beyond the learner's ability to form a stable sound image, the student may indeed stop counting. But the student may also stop perceiving. The characters may become brief, indistinct events rather than recognizable sound patterns. That is not learning. It is overload.

The problem with counting is not that students perceive Morse elements. The problem is that they rely on conscious analytical reconstruction as the primary path to meaning. Proper instruction should move students away from analysis and toward direct sound recognition, but it should not do so by making the sound inaccessible.

For this reason, LICW does not treat higher character speed as inherently superior. A higher character speed may be appropriate later, as automatic recognition strengthens and conscious analysis decreases. During initial learning, excessive speed can be counterproductive and self-defeating.

Relationship Of Character Speed To Farnsworth Spacing

Koch's concern was that, at very slow speeds, the character itself loses its acoustic unity. This is the danger LICW seeks to avoid by preserving adequate character speed.

Farnsworth spacing may be used cautiously to reduce cognitive load while maintaining proper character formation. However, excessive spacing introduces its own problems by altering rhythm and weakening flow. For that reason, LICW treats both character speed and spacing as academically important.

Character speed protects the acoustic identity of each character. Spacing must also be managed so that it does not become a substitute for Continuous Flow. The role and limitations of Farnsworth spacing are examined separately in AP-05.

Instructional Rationale

When character speed is too fast, students may be unable to form a stable association between the sound image and the character. They may experience confusion, fatigue, frustration, and avoidance. In that case, the training may appear rigorous, but it is not necessarily productive.

Increased Time To Recognize

By contrast, appropriate character speed requires the student to begin forming the correct habit from the start: hearing the sound and associating it directly with meaning.

This is why the difficulty of 12 WPM character speed is not a defect in the method. It is part of the method. At the same time, LICW's use of 12 WPM character speed with limited Farnsworth spacing reflects restraint. It preserves sound-pattern formation while giving students enough room to begin recognizing what they hear without being overwhelmed.

Potential Failure Modes

If character speed is reduced too far, LICW instruction can drift away from sound-first learning even if the class appears to be helping in the short term.

Relationship To The LICW Curriculum

The Beginners Carousel begins at 12 WPM character speed because that speed reflects Koch's practical training conclusion: above the Gestalt threshold, but below the level that overwhelms most beginners.

As students progress, the Intermediate curriculum strengthens Automatic Character Recognition (ACR), increasingly continuous Flow, Instant Flow Recovery, and Character Flow Proficiency. Recognition delay may diminish, but the instructional objective is functional, lower-effort reception rather than a

TTR target. These gains depend on learning characters as sound patterns from the beginning.

The Advanced curriculum then extends those gains into CW fluency and mastery under more natural and demanding operating conditions. That progression would be weakened if early learning were built on slow analytical reconstruction or on excessive speed that prevents stable sound-pattern formation.

AP-05 FARNSWORTH SPACING: TRANSITIONAL USE

Academic question • What is the legitimate role of enhanced spacing?

LICW POSITION

LICW accepts modest Farnsworth spacing as a limited early accommodation that can help a student hear well-formed characters while reducing immediate load. It should be deliberately reduced as continuous receiving develops; wide spaces must not become the normal long-term listening environment.

RESEARCH AND EVIDENCE BOUNDARY

The risks of dependency and disrupted natural rhythm are grounded chiefly in LICW instructional reasoning and historical analysis; the source does not establish a universal experimental harm threshold or a fixed schedule for removing spacing.

INSTRUCTIONAL IMPLICATION

Separate character speed from effective speed. Use spacing only for a clear developmental reason and guide learners back toward natural intercharacter and word timing.

RESEARCH AND RATIONALE

Background

This concern is supported by early research. Biegel criticized the older slow-code method because reducing the entire sending process caused characters to lose their auditory identity as complete rhythmic patterns. At slow speeds, characters became atomized into countable sequences of long and short tones, forcing students into a method of perception that later had to be abandoned.

Koch's 1936 study is especially important on this point. Koch emphasized that Morse code has specific proportional timing relationships and that, at a given speed, the ratio of short and long tones and their spacing should remain consistent. He also framed aural Morse reception as a Gestalt process, in which the listener perceives organized sound patterns rather than isolated pieces.

This has direct implications for instruction. When spacing is artificially expanded, the learner is not simply hearing "easier" Morse code. The learner is hearing Morse code under altered temporal conditions. The character may

remain intact, but the continuity between characters is changed. That change affects rhythm, anticipation, recovery, and flow.

Taylor's later experimental work adds a useful balancing note. In Taylor's 1943 study, students were instructed to recognize characters as organized auditory patterns and avoid analyzing them into dots and dashes; however, the broader experimental results caution against assuming that higher-speed character presentation alone will automatically produce superior learning outcomes. The implication for LICW is that Farnsworth spacing should not be treated as a universal solution. It may support one aspect of learning, but it does not by itself develop fluency.

When LICW began in 2019, the club used a method that was popular at the time: characters were commonly taught at approximately 20 WPM character speed with a much lower effective speed, often around 5 WPM. This reflected the prevailing belief that students should hear characters at a realistic acoustic speed from the beginning, while widened spacing would make early recognition manageable.

Initially, this seemed sensible. Many students could learn to identify characters under those conditions, and the method appeared to reduce early frustration. Over time, however, careful observation of student performance raised concerns.

Many students became stagnant and were unable to progress smoothly into the Intermediate level. The problem often appeared when effective speed was increased beyond approximately 20/6.5. Students who had been comfortable with wide spacing frequently struggled when the space between characters was reduced. They could recognize characters when there was ample time to reset between them, but they had difficulty maintaining continuity when characters began to arrive in closer succession.

This pattern suggested that some students had learned not only the characters, but also the extra space. The widened interval had become part of the learning environment and, in some cases, part of the learned habit. When the spacing was reduced, the task felt substantially different even though the character speed itself had not changed.

In practical terms, students often reverted to conscious decoding, became anxious when the next character arrived too soon, and lost continuity after a miss. These are exactly the difficulties LICW's flow-based instruction is

designed to address. The issue was not simply speed. It was the absence of developed flow under realistic timing.

This institutional experience closely aligns with the research concerns described above. Biegel supports the value of preserving character sound patterns, but only with a deliberate progression toward normal timing. Koch reinforces the importance of rhythm, proportion, and Gestalt perception in Morse code reception. LICW's experience indicates that when widened spacing is used too long, students may not develop the continuity, recovery, and rhythmic processing needed for successful advancement.

LICW's position is that characters should be taught as complete auditory patterns and at realistic character speeds, but spacing should move toward natural timing as soon as practicable. Enhanced spacing may be used when it serves a clear developmental purpose, but it should not become the primary long-term learning environment.

The instructional goal is not merely for students to identify characters. The goal is for students to copy continuous Morse code in a way that resembles real operation. That requires rhythm, continuity, recovery, and flow. Any use of enhanced spacing should therefore be judged by whether it helps the student move toward that goal or allows the student to avoid it.

Instructors should be careful not to present Farnsworth spacing as a cure-all or as the default answer to difficulty. Some struggle is expected in learning a real-time skill. If a student is overwhelmed, a modest amount of additional spacing may be appropriate for a limited period. But the instructor should explain that the spacing is temporary and that the student's eventual goal is to copy code in natural rhythm.

AP-06 COMMUNICATION-DRIVEN CHARACTER SEQUENCE

Academic question • On what basis should the initial character order be selected?

LICW POSITION

LICW favors a communication-driven progression that supports useful words, exchanges, and early operating, rather than a character list inherited from an aptitude test or attributed inaccurately to Koch. New sounds are integrated with familiar patterns and practical communication.

RESEARCH AND EVIDENCE BOUNDARY

Historical sequences developed for prediction or testing are not automatically optimal for teaching communication. Classroom design remains a reasoned adaptation rather than a validated unique sequence.

INSTRUCTIONAL IMPLICATION

Build enough variety to allow meaningful operating material while preserving manageable introductions and immediate sound-based associations.

RESEARCH AND RATIONALE

Background

Koch used more than one character progression in his training work. The exercise charts reproduced in his report allow those progressions to be reconstructed, and none begins K M R S U. The use of more than one progression is itself important because it shows that character order was an experimental and instructional variable rather than a single canonical sequence.

In at least one comparison, Koch used a progression that appears weighted with easier characters early in the course while arguing that his two-tone procedure produced faster initial learning. He also did not disclose the size of the comparison groups. Because Koch himself recognized that character difficulty affects the shape of a learning curve, the use of different progressions and incomplete group information make that comparison difficult to treat as a controlled finding.

LICW's review establishes two separate points. Koch's documented progressions do not begin K M R S U. K M R S comes from Otto Lipmann's

1919 radiotelegraph-aptitude work; a contemporary 1920 account identifies his five signs as K, M, R, S, and V. The sequence was later incorrectly associated with Koch.

Lipmann's work remains important as aptitude research. He proposed that future performance in Morse-code acquisition could be predicted by observing how well a learner acquired a small set of Morse signs under controlled conditions. It was not designed as a communication-driven beginner curriculum.

Lipmann's central insight was that early performance on a small amount of actual Morse learning could predict later performance. Donald Taylor directly tested that broader proposition in 1943. Taylor's Initial Learning Test used eight different characters - period, comma, slash, question mark, 2, 9, F, and C - and produced a validity coefficient of .73 against later code achievement in his sample.

This matters because neither Koch's 1936 report nor Taylor's 1943 validation supplies a scientific basis for treating K M R S U as a privileged instructional sequence. K M R S came from Lipmann and was later incorrectly associated with Koch. Historical labels should not determine a communication-driven curriculum.

Instructional Rationale

LICW takes the opposite approach. The Beginners Carousel introduces characters in a way that allows students to begin encountering useful QSO patterns and abbreviations early in the learning process. Students are not merely collecting characters; they are beginning to hear and use the building blocks of real communication.

Acknowledgments

As students acquire more characters, they are increasingly able to recognize and use real QSO elements. This allows QSO protocol and QSO abbreviations to enter the Beginners curriculum naturally rather than appearing later as a separate subject.

This is an important distinction. LICW does not want students to finish learning characters and only then begin learning how Morse code is used. LICW wants students to begin learning communication while they are learning the characters.

Frequency-Of-Use Considerations

Characters that occur frequently in meaningful operating contexts are introduced early when practical. This allows students to encounter recurring patterns sooner and to begin forming useful sound associations in context.

This does not mean the sequence is a rigid frequency table. It is a practical curriculum design choice that balances character learning, pattern exposure, communication value, and instructional flow.

Contrast With Aptitude-Testing Sequences

Lipmann's 1919 work is historically important because K M R S came from his aptitude research and because he used early Morse learning to assess later potential. That does not make K M R S U a beginner curriculum. Taylor's later test used a different eight-character set, showing that the predictive principle is independent of any particular character order.

LICW is not trying to obscure meaning from the beginner. LICW is trying to help the beginner form sound-first recognition while gradually entering the language, rhythm, and structure of CW communication.

For this reason, adopting an aptitude-testing sequence as a beginner curriculum sequence would be a category error. It would confuse a research tool for predicting performance with a teaching tool for developing communicative competence.

Relationship To The LICW Curriculum

This creates a cohesive learning experience in which students are not only learning characters, but also beginning to understand how those characters function in real communication.

AP-07 THE TWO-CHARACTER STARTING QUESTION

Academic question • Why does the LICW Carousel not begin with a universal two-character pair?

LICW POSITION

Koch did begin a fixed-start procedure with two contrasting sounds, but his later instruction introduced individual new characters. LICW's rolling Beginner Carousel has no universal first lesson. It introduces new characters one at a time, with no more than three during an hour, and first allows a student to hear the sound before naming it.

RESEARCH AND EVIDENCE BOUNDARY

The historical use of an initial pair does not establish that a two-character start is universally best. The different architecture of a continuous-entry carousel is an important practical constraint.

INSTRUCTIONAL IMPLICATION

Explain that LICW adapts Koch's principles of discrimination, acoustic familiarity, limited cognitive load, and cumulative practice rather than denying the historical paired start.

RESEARCH AND RATIONALE

Background

The phrase "Koch two-character method" is often used as shorthand for Koch's procedure. It is historically accurate that Koch began with two characters, but incomplete if it implies that the number two was the defining feature of the entire method.

Koch's report shows two distinct stages: a two-character opening used to establish acoustic discrimination and rhythm, followed by incremental expansion in which subsequent new characters were added one at a time.

What Koch Actually Did

Koch deliberately began his fixed-start training with two well-differentiated sound patterns at the training tempo. Their letter identities were initially withheld. The learner first listened for the recurring acoustic wholes and adjusted to the rhythm of the stream. Two distinct sounds provided an immediate basis for discrimination without requiring the beginner to manage a large unfamiliar character set.

Only after the two sound patterns had become distinct and familiar were the corresponding letters named. Once those first sound-to-letter relationships were firmly established, Koch added the next character and thereafter expanded the set one new character at a time, integrating each new sound with the characters already known.

The initial pair and the subsequent single-character additions therefore served different instructional purposes. Koch did not demonstrate that two characters are universally optimal, but he did give the first pair a specific function: create manageable acoustic discrimination at a common starting point. His broader principle was to build stable recognition without exceeding the learner's scope of comprehension.

Why LICW Does Not Begin With Two Characters

This is an adaptation of Koch's principles, not a rejection of them. His fixed-start opening cannot be copied literally in a continuous-entry Carousel, but the underlying objectives remain applicable: preserve acoustic wholeness, control unfamiliar material, establish direct sound-to-meaning relationships, and expand the character set without destabilizing prior learning.

Sound Familiarity Before Identification

BC1 preserves one of Koch's most valuable procedures. Before the instructor tells students which letter a new character represents, the character is first played as an unfamiliar acoustic pattern. Students listen for its recurrence and indicate each time they recognize the sound. The immediate task is familiarity with the acoustic object, not naming it.

Only after sound familiarity begins to develop is the letter identity attached. The character is then practiced and integrated with material already in the curriculum stream. This preserves Koch's sound-first sequence - familiarity before identification - while fitting the structure of the Beginners Carousel.

The Later Two-New-Character Experiment

Koch later described practical experience in a training course in which two additional new letters were introduced at the same time after a larger character set had already been learned. He reported that this exceeded the learner's scope of comprehension, disturbed reception of previously known characters, and required substantially longer consolidation than when new letters were introduced individually.

Relationship To Flow-Based Learning

Introducing one unfamiliar character at a time allows the character set to expand within an already familiar stream. The student can build familiarity with the new sound while continuing to hear and use material that is already known, supporting continuity, recovery, and early communication rather than isolated character study.

Relationship To The LICW Curriculum

In BC1, a student may enter the Carousel at any point. Each new character is introduced individually, first as an unidentified acoustic pattern, then identified after sound familiarity begins to form, and finally integrated into multi-character practice and communication-oriented material. No more than three new characters are introduced during a one-hour lesson.

The student therefore works within an expanding and continuously reinforced character set rather than depending on a common starting pair. This supports sound-first learning, repetition, flow, and early communication while remaining consistent with Koch's broader practical principle: new material should be added gradually enough that previously established recognition remains secure.

AP-08 NUMBERS AND PROSIGNS FROM THE BEGINNING

Academic question • Why integrate numbers and prosigns instead of postponing them?

LICW POSITION

LICW introduces numbers and prosigns alongside letters because Morse is a communication system. Callsigns, reports, operating conventions, and common exchanges use these forms; delaying them creates an artificial division between character learning and practical use.

RESEARCH AND EVIDENCE BOUNDARY

This is a curriculum design judgment supported by operating relevance, not evidence that a particular introduction order universally accelerates acquisition.

INSTRUCTIONAL IMPLICATION

Integrate essential nonletter material into familiar listening and sending contexts without demanding immediate mastery of every form.

RESEARCH AND RATIONALE

Background

Many Morse code training programs introduce letters first and defer numbers and prosigns until a later stage. This approach is often justified on the basis of simplicity. By limiting the initial character set, early learning may feel more manageable and structured.

While this approach may reduce short-term difficulty, it introduces a separation between character learning and communication. Students may become comfortable recognizing letters in isolation, but remain unable to understand or participate in even the simplest real-world exchanges.

Communication From The Start

This reinforces the idea that Morse code is not an abstract system to be mastered first and used later. It is a communication system that can be experienced and understood progressively.

Rhythm And Pattern Development

Many prosigns function as single acoustic units and reinforce the concept that Morse code is heard as patterns rather than assembled piece by piece.

Numbers, while sometimes longer in structure, introduce variation and expand the student's exposure to different rhythmic forms.

Contrast With Letter-First Approaches

The letter-first approach simplifies early learning by reducing the number of elements the student must manage. However, it also delays exposure to key aspects of real communication.

AP-09 RHYTHM AS A SUPPORTING PROCESS

Academic question • Can rhythm strengthen sound-first learning and flow?

LICW POSITION

LICW recognizes rhythm as intrinsic to Morse timing and as a promising way to support perception of larger familiar acoustic units. It distinguishes rhythmic patterns from a fixed musical beat and treats music-based instruction as exploratory, not a replacement for foundational listening.

RESEARCH AND EVIDENCE BOUNDARY

Historical associations between rhythm and telegraph skill do not establish a specific modern music-based teaching intervention. LICW's experiments with music-aligned resources have been mixed.

INSTRUCTIONAL IMPLICATION

Preserve correct timing and emphasize the sound of common words, abbreviations, and exchanges. Test rhythm-enhanced tools rather than adopting them by analogy alone.

RESEARCH AND RATIONALE

Introduction

Classroom observation has long suggested a relationship between musical ability and Morse code acquisition. Students with musical backgrounds often appear to progress more quickly and to develop stronger proficiency. Historical support for that observation can be found in early telegraphy research, including Thurstone's 1919 finding that rhythm was strongly associated with success in telegraphy.

The Harmonic Origins Of Morse Code

Chris Rutkowski, NW6V, has argued that the familiar 3:1 timing relationship of International Morse did not originate in Samuel Morse's original American Morse, but emerged later through Friedrich Gerke's 1848 revision for the German Post Office. In this view, the now-familiar structure of one-unit dits and three-unit dahs reflects not only efficiency, but also a form of rhythmic regularity that may help explain why Morse is experienced as patterned sound rather than as arbitrary signal lengths.

Rutkowski also offers an explanation for the seven-unit separation between words, illustrating how the motion of the hand and the on/off state of the signal

can be understood as rhythmically aligned. Whether or not one accepts the broader harmonic interpretation, the discussion is useful because it draws attention to the inherently rhythmic structure of Morse timing.

Enhancing The Learning Of Morse Code With Rhythm

Rhythm appears to play a particularly important role in Morse code learning because pitch and timbre, unlike in most music and spoken language, remain comparatively fixed. In that sense, the learner's ear is working primarily with timing, duration, grouping, and pattern.

Koch's discussion of Bucher's 1924 report, Work and Rhythm, suggests that rhythm can positively influence performance when learning conditions are structured to take advantage of it. More recently, Mohapp's 2015 thesis examined rhythm perception in music as a teaching and learning process for Morse code. Her review of wartime training techniques used by the Women's Royal Australian Naval Service suggests that musical rhythm may indeed have played a positive role in the rapid acquisition of code skill.

For additional perspective, LICW consulted orchestra conductor Johannes Stosch, KI6M. Stosch's view is that the ear is the primary teacher. As with language learning or musical training, repeated exposure to good sound patterns is central. He acknowledges the symmetry of Morse timing, but places greater emphasis on rhythm than on harmonic interpretation. In his view, individual letters are too variable in length to align with a fixed beat, but words and common operating units often develop recognizable rhythmic identities.

That observation is especially relevant to LICW because it aligns closely with the club's emphasis on flow, pattern recognition, and the transition from character assembly to word discovery. Common items such as RST, FER, BK, AS, SK, and callsigns may begin to stand out not because of pitch, but because of their recurring rhythmic signatures.

The Difference Between Rhythm And Beat

This distinction matters because it suggests that rhythm-based support for Morse learning is unlikely to come from imposing a fixed beat. It is more likely to arise from helping learners perceive recurring temporal patterns at the level of words, phrases, and familiar operating forms.

LICW Efforts To Produce Musical Content

LICW has experimented with adding CW to musical and rhythm-based video content. Results have been mixed. Some attempts appeared to support recognition, while others did not. These experiments suggest that the mere presence of music is not enough; if rhythm is to support learning, the relationship between music and Morse timing must be carefully designed.

That conclusion is important. It suggests that rhythm may have real instructional potential, but that effective implementation likely requires collaboration among musicians, educators, and experienced CW practitioners. At present, the evidence is promising but exploratory rather than definitive.

The Morsebass Project

In that sense, projects such as MorseBass appear most compatible with later stages of recognition, where learners are moving beyond isolated character assembly and toward larger meaningful units. This interpretation is also consistent with LICW's view that rhythm is best understood as a supporting process, not a replacement for sound-first character learning.

AP-10 RECIPROCITY OF SENDING AND RECEIVING

Academic question • How can sending reinforce reception without overclaiming transfer?

LICW POSITION

Sending is essential communication practice and may strengthen familiarity with auditory forms, spacing, timing, and composure. Hear It, Send It, and related exercises put listening and production into a useful feedback loop.

RESEARCH AND EVIDENCE BOUNDARY

LICW does not claim a quantified reduction in TTR from sending or that one sending device creates receiving fluency.

INSTRUCTIONAL IMPLICATION

Ask learners to attend to the sounds they produce, develop accurate rhythm, and continue appropriately after sending mistakes.

RESEARCH AND RATIONALE

Hear It, Send It, Hear It Again

When a student hears a character or short pattern and sends it immediately, the learner experiences the rhythm in several ways: the sound is heard, the rhythm is physically produced, and the result is heard again as auditory feedback. That ear-brain-hand loop can strengthen familiarity with the acoustic form and give the instructor an observable way to assess timing and spacing.

LICW therefore uses “Hear It, Send It” and related exercises as a practical reinforcement technique. The claim is intentionally modest: coordinated hearing and production may support sound familiarity, rhythm, and recall. LICW does not treat sending practice as a proven shortcut that will reduce TTR by a predictable amount.

Flow And Recovery In Sending

Sending practice also gives students a place to develop continuity and composure. A minor sending error need not produce panic, a full restart, or loss of rhythm. Training should help students remain calm, make an appropriate correction when the communication requires one, and continue. The same emotional neutrality that supports reception after a miss can support resilient sending.

Common CW items such as CQ, DE, TU, THE, 5NN, common abbreviations, and familiar endings eventually become recognizable rhythmic forms. Sending those forms smoothly may contribute to familiarity with their overall shape and may support the transition from separate characters toward larger functional units.

This relationship is compatible with the broader scholarly lineage: Bryan and Harter described the emergence of higher language units, Koch emphasized acoustic wholeness and rhythm, and wartime training research treated sending and receiving as measurable skilled performances. None of those sources, however, establishes that one particular keying method uniquely produces fluent reception.

AP-11 STRAIGHT KEY AS THE PREFERRED INITIAL METHOD

Academic question • Why recommend a straight key, and what exceptions matter?

LICW POSITION

LICW recommends beginning with a straight key because forming the elements manually can make timing and rhythm physically and aurally explicit. Paddles and keyers are legitimate, often desirable tools, and alternate devices may be necessary for comfort or accessibility.

RESEARCH AND EVIDENCE BOUNDARY

The rationale is educational and experiential; it is not a controlled proof that all straight-key beginners will become better receivers or that early paddles cause damage.

INSTRUCTIONAL IMPLICATION

Recommend, do not require, a straight-key start. Preserve sound awareness and good timing whichever device the student uses.

RESEARCH AND RATIONALE

Background

Beginning students are not yet sending fluently. They are learning to associate sound with character, to internalize rhythm, and to develop continuity between what they hear and what they produce. The initial sending method should reinforce those goals, not bypass them.

Accessibility And Medical Realities

This position should be applied with kindness and judgment. For some students, especially those dealing with arthritis, hand pain, tremor, fatigue, limited mobility, injury, or other medical realities, a straight key may be uncomfortable or impractical. In those cases, the use of paddles, a keyer, or another appropriate sending method may allow the student to participate more fully.

When an alternate sending method is used for medical or accessibility reasons, instructors should still encourage the same underlying goals: careful listening, correct rhythm, sound-first learning, and awareness of the relationship between what is heard and what is sent.

A straight key requires the student to generate Morse rhythm manually. Each element-dit, dah, and space-is formed through the student's own action. This creates a direct physical and auditory connection among hand movement, element timing, spacing, and the resulting sound.

This connection makes the rhythm and timing of Morse code particularly explicit for a beginner. The student is not simply producing a character but actively forming its acoustic pattern. This experience may reinforce familiarity with the relationship between a character's sound, its timing structure, and the movement required to produce it.

Paddles and electronic keyers automate the timing of individual elements while leaving the operator responsible for forming characters and maintaining appropriate spacing. They are efficient and entirely appropriate for many operators, including beginners. However, they provide less direct experience with manually forming individual elements. When these devices are used during initial training, deliberate attention to listening, rhythm, and spacing remains important to developing the same foundational sound awareness.

Rhythm And Sound Development

When students develop a sense of rhythm through manual formation, that experience may support familiarity with the same rhythmic forms in reception. LICW uses this as an instructional rationale, not as a claim of a uniquely proven transfer mechanism.

Relationship To Receiving Skill

If sending is automated from the beginning without deliberate listening, the student may receive less direct practice forming timing and spacing. This is why LICW pairs any sending method with active listening to the generated Morse rather than treating key movement alone as the learning objective.

When To Introduce Paddles And Keyers

At that stage, the student already has an internal model of correct timing. The keyer then becomes a tool for efficiency rather than a substitute for learning.

Keyboard sending may also have a place in specific operating contexts, but it should not replace the development of manual sending skill during early learning.

Relationship To The LICW Curriculum

In the Beginners Carousel, the primary objective is sound-first recognition and early flow. Sending is introduced as a supporting activity, not as a separate performance skill.

As students move into Intermediate and Advanced levels, sending becomes more fluid and more integrated into conversational operation. At that point, the use of paddles and keyers is entirely appropriate and often preferred.

Long-Term Sending Adaptability

This section addresses the academic rationale for LICW's beginning sending recommendations. The broader cultural meaning of sending, including the mind-hand connection, adaptability across keys, rhythm, and respect for traditional sending styles, is addressed in The LICW Culture Guide.

As students develop, LICW should encourage broader sending adaptability. A capable CW operator should understand that good sending does not come from the key alone. It comes from the operator's internal rhythm, timing, control, and ability to adjust mentally to different instruments and conditions.

For that reason, students who have developed a sound foundation should be encouraged, when appropriate, to explore paddles, keyers, bugs, and other sending methods. Each method teaches something useful. Paddles and keyers can help develop speed flexibility and control. Bugs preserve an important part of CW tradition, including the expressive swing and rhythm associated with older operating styles.

The long-term goal is not loyalty to one device. The long-term goal is a strong mind-hand connection: the ability to send cleanly, rhythmically, and communicatively using the tool at hand.

II. LEARNER DEVELOPMENT AND CURRICULUM

AP-12 HUMAN PERFORMANCE AND INDIVIDUAL DIFFERENCES

Academic question • How should normal variation in learning change instructor expectations?

LICW POSITION

Rates of Morse acquisition differ substantially, and early difficulty is not a verdict on eventual capability. Curriculum should offer distributed practice, feedback, supportive instruction, appropriate challenge, and opportunities for on-air success.

RESEARCH AND EVIDENCE BOUNDARY

Historical work on early-task performance and aptitude describes group tendencies, not a sufficient basis to screen individuals or predict ceilings. Instructors should not infer cause from a single observed plateau.

INSTRUCTIONAL IMPLICATION

Address the developmental task before the learner; adapt support without creating arbitrary deadlines or remedial stigma.

RESEARCH AND RATIONALE

Introduction

Human performance in Morse-code acquisition varies widely. Some learners progress rapidly, while others require substantially more exposure, practice, and support. That variation should be expected and should shape both instructor expectations and curriculum design.

The detailed history of Morse research is developed later in The Scholarly Foundations of Morse Code Learning. The purpose here is narrower: to translate the research into practical expectations for students and instructors.

Why Performance Varies

Historical research and LICW classroom experience point to three broad influences on the rate of acquisition: individual perceptual and learning differences, the distribution and quality of practice, and motivation or sustained engagement. These factors interact. None should be treated as a fixed verdict on a learner's eventual capability.

Lipmann, Koch, and Taylor each examined whether early performance on the actual task could provide information about later learning. Taylor's Initial Learning Test supported the broader proposition that early task learning can predict rate of later achievement in a group. LICW treats that finding as a reminder that learners differ, not as a basis for screening students or predetermining potential.

Practice and motivation are especially important because they are open to instructional influence. Short, distributed, purposeful practice; clear feedback; realistic goals; supportive instructors; and meaningful operating opportunities can help students remain engaged long enough for familiarity and automaticity to develop.

A Continuous Developmental Model Of Morse Code Learning

LICW understands Morse development as one continuous learning path with three major phases. The phases describe changes in the nature of the task, not merely increases in speed.

The Path To Proficiency

The Path to Proficiency extends from BC1 through entry into INT1. Its objective is foundational operating competence: learning Morse as sound, acquiring the 44 basic characters, developing early short-word flow, learning to send with useful rhythm and spacing, and beginning real operating.

The Path To Fluency

The Path to Fluency extends from INT1 through ADV1. The task changes from knowing the characters to remaining in the stream as Morse becomes continuous language. Flow Skills Development, Increasing Effective Speed, Word Discovery, and Conversational Fluency progressively reduce cognitive drag and increase continuity, recovery, context use, and comprehension.

At this stage the student learns that exact transcription and conversational comprehension are different receiving objectives. The developing operator learns to change listening posture, use Short-Term Retention when exactness matters, avoid Missed-Copy Fixation, and increasingly allow words and meaning to emerge directly from the continuing sound stream.

The Path From Fluency To Mastery

The Path from Fluency to Mastery extends through ADV2 and ADV3. It does not replace fluency with a different skill. It deepens and extends fluency into greater speed, density, endurance, resilience, and lower-effort QRQ operation.

The objective is not speed for its own sake, but durable conversational capability under increasing demand.

These developmental stages therefore fit within three larger phases: Character Recognition, Short-Word Character Flow, and On-Air Readiness build proficiency; Flow Skills Development, Increasing Effective Speed, Word Discovery, and Conversational Fluency build fluency; and ADV2 and ADV3 extend that fluency toward mastery.

Managing Expectations

Progress is rarely linear. Learners may experience periods of rapid improvement, apparent plateaus, temporary regression, or sudden breakthrough. Bryan and Harter interpreted some plateaus as reorganization of lower-order habits, while Taylor later cautioned that plateaus were not universal. LICW therefore teaches that a plateau may occur and is not evidence of failure, without presenting it as a required stage of learning.

A student should be evaluated against the developmental task currently being built. Early success means growing sound familiarity and operating competence. Intermediate success increasingly means continuity, recovery, Word Discovery, and comprehension. Advanced success increasingly means durable, lower-effort communication under greater demand.

AP-13 CONTINUOUS CURRICULUM RATHER THAN FIXED DEADLINES

Academic question • Why use continuous-entry and open-ended proficiency development?

LICW POSITION

LICW prefers a Beginner Carousel and ongoing Intermediate/Advanced offerings for skills that develop at individual rates. Fixed-duration offerings remain useful for orientation and focused practice, but completion of a calendar cannot certify a perceptual skill.

RESEARCH AND EVIDENCE BOUNDARY

This is an instructional design position based on learning variability and LICW experience, not a direct randomized comparison of all conceivable course formats.

INSTRUCTIONAL IMPLICATION

Let students repeat, consolidate, and advance when current capability warrants it. Use Bootcamp as focused reinforcement, not a guarantee of advancement.

RESEARCH AND RATIONALE

Background

Morse code is not primarily a knowledge-based subject. It is a perceptual, cognitive, and performance skill. Students are not simply learning facts about code; they are developing sound recognition, rhythm, timing, flow, recovery, and automaticity. These abilities emerge gradually through repeated exposure and sustained practice over time.

Because of this, progress is often uneven. Students may remain at a plateau for a period of time and then experience sudden improvement. Others may need repeated exposure to the same material before it becomes comfortable. This is normal in skill acquisition and should be expected in Morse code learning.

Instructional Rationale

A defined course length assumes that students will move through the learning process at roughly the same pace. In Morse code instruction, that assumption is usually incorrect. Students differ in recognition speed, comfort with sound

patterns, tolerance for missed copy, practice consistency, prior experience, and ability to maintain flow under pressure.

When a fixed course ends, some students may be ready to advance, while others may still need time, repetition, and reinforcement. Advancing students before they are ready can create unnecessary frustration at the next level. Holding all students to the same timetable can also discourage those who are making real progress but not yet at the expected endpoint.

Application In The LICW Curriculum

The Beginners Carousel reflects this philosophy. It is intentionally repetitive and continuous. Students may enter, remain, repeat, and progress when ready. The structure provides consistency without penalty. Its purpose is not to force completion by a particular date, but to build the foundation needed for further development.

At the Intermediate and Advanced levels, LICW uses an ongoing weekly class model rather than fixed-duration proficiency courses. Students remain engaged with classes that support gradual development over time. This allows instruction to remain purposeful and structured while recognizing that fluency, flow, and confidence develop through continued exposure and practice, not through completion of a fixed course calendar.

This model also preserves continuity across the curriculum. Students can continue working at the appropriate level until the underlying skills are strong enough to support advancement.

The Specific Role Of Bootcamps

Bootcamps are not designed to replace the regular curriculum or to move a student from one level to the next simply because a short course has been completed. Rather, they are designed to address a specific learning and mindset barrier: the student's response to missing.

Many students treat a missed character or word as a failure. That reaction can produce Missed-Copy Fixation, hesitation, loss of rhythm, and breakdown of flow. Bootcamps are designed to change that response. They teach students that missing is not failure, and that the essential skill is to remain in motion, recover instantly, and protect what comes next.

In that sense, Bootcamps are accelerators of mindset and learning behavior. Their value lies in helping students approach the ongoing curriculum with

better habits, greater confidence, and a healthier relationship with imperfection.

AP-14 OVERLAP, COMFORT, AND STRETCH

Academic question • Why do LICW class levels intentionally overlap?

LICW POSITION

LICW treats levels as overlapping ranges of development. Comfort-zone classes stabilize current skills; stretch classes provide manageable challenge and practice recovering from missed material. Students may benefit from both simultaneously.

RESEARCH AND EVIDENCE BOUNDARY

The balance is a reasoned instructional strategy rather than a fixed quantitative formula that fits all learners.

INSTRUCTIONAL IMPLICATION

Normalize imperfect stretch performance, monitor disengagement or excessive fatigue, and help a former stretch environment become a comfortable one over time.

RESEARCH AND RATIONALE

Background

In traditional instructional models, progression is often defined by clearly separated levels with specific entry and exit criteria. Students are expected to complete one level before advancing to the next.

Morse code acquisition is not linear. Skill development occurs unevenly, with periods of rapid progress, plateau, and consolidation. For that reason, the LICW curriculum is designed with intentional overlap between levels to support continuous development rather than staged completion.

Without explicit guidance, instructors may unintentionally treat levels as gates rather than ranges, which can lead to unnecessary pressure on students and reduced effectiveness of the program.

Stretch Classes

Excessive reliance on comfort zone classes may lead to stagnation. Excessive reliance on stretch classes may lead to frustration and disengagement. Balanced participation supports the most effective progression.

Over time, a stretch class often becomes the student's new comfort zone. Material that once felt fast, difficult, or slightly beyond reach gradually becomes

familiar through repeated exposure. As that happens, cognitive load decreases, recovery improves, and the student becomes more comfortable operating at that level.

This is one of the ways progression occurs within the LICW model. Students do not move forward simply because they have completed a level. They move forward because repeated exposure to appropriate challenge gradually changes what feels manageable. Yesterday's stretch becomes today's comfort zone, and a new stretch can then begin.

Relationship To Flow-Based Learning

Together, they help students remain engaged with the sound flow while developing real-time processing ability. As students repeat this cycle, stretch becomes comfort, comfort becomes stability, and stability creates readiness for the next appropriate challenge.

AP-15 ERRORS, MISSES, AND INSTANT FLOW RECOVERY

Academic question • Why is recovering from a miss an explicitly taught skill?

LICW POSITION

Errors and missed content are inevitable in real-time reception. LICW emphasizes quick recovery and continuity, especially in conversational tasks where trying to reconstruct the past can destroy the next unit of meaning.

RESEARCH AND EVIDENCE BOUNDARY

The principle does not eliminate the responsibility to recover or verify required exact information. Different receiving tasks determine how and when uncertainty is handled.

INSTRUCTIONAL IMPLICATION

Teach students to notice, release, and rejoin the stream; request repeats and verify exact material through orderly procedures when required.

RESEARCH AND RATIONALE

Background

Students commonly interpret missed characters or words as failure. This reaction is understandable, but it is inconsistent with the nature of Morse code as a real-time skill. Unlike written or recorded material that can be reviewed or corrected, Morse code is received as a continuous stream. The incoming code does not pause to allow the operator to resolve uncertainty.

LICW's position is that missing is expected and unavoidable. It is not a sign of failure. It is part of the normal learning process and remains present even at advanced levels of operation.

Students are not trained to achieve perfect copy. They are trained to maintain continuity, remain engaged with the incoming code, and prioritize what comes next over what was missed.

Instructional Rationale

When a student treats a missed character as a problem to be solved before proceeding, Missed-Copy Fixation can develop. Attention leaves the continuing signal, rhythm is lost, and subsequent characters are missed. This

creates a cascade effect in which a single miss leads to multiple losses of continuity.

Effective operators adopt a different approach. When a character or word is missed, they allow it to pass and immediately re-engage with the next incoming information. Over time, this ability to recover quickly becomes automatic.

Instruction must reinforce this behavior. Students should be encouraged to remain relaxed, accept imperfection, and stay in motion. Accuracy will improve as recognition becomes more automatic, but continuity must be preserved from the beginning.

The acceptance of error is directly connected to flow-based learning. Flow depends on uninterrupted engagement with the incoming code. Attempts to achieve perfect copy disrupt that engagement and prevent the development of continuous processing.

By contrast, accepting occasional loss allows the student to maintain rhythm and continuity. This, in turn, supports the reduction of Time To Recognize (TTR), improves overall comprehension, and enables the emergence of larger patterns such as words and phrases.

Instructors should avoid reinforcing the idea that correct copy of every character is the objective. Exercises should be structured in a way that encourages forward motion and immediate recovery rather than correction of past errors.

Students who struggle should not be encouraged to slow down indefinitely in pursuit of perfection. Instead, they should be guided toward maintaining continuity at a level that challenges them while still allowing them to remain engaged.

AP-16 REPETITION, OVERLEARN, AND CONSOLIDATION

Academic question • Why is continued practice essential after initial understanding?

LICW POSITION

Skill becomes dependable through purposeful exposure, repetition, and time. LICW uses OverLearn to consolidate capabilities beyond first success and stresses distributed, manageable sessions rather than fatigue-driven repetition.

RESEARCH AND EVIDENCE BOUNDARY

Learning curves and historical hierarchy-of-habits research illuminate the phenomenon but do not imply a universal repetition count or guaranteed automaticity date.

INSTRUCTIONAL IMPLICATION

Vary material and conditions, continue after initial success, and distinguish productive challenge from overload. Include periodic return to a stable performance baseline.

RESEARCH AND RATIONALE

Background

Students often expect progress to occur in a steady and predictable manner. When improvement is not immediately visible, repetition may be interpreted as a lack of progress rather than as part of the learning process.

This expectation is inconsistent with the nature of Morse code as a perceptual and cognitive skill. Development occurs gradually through repeated exposure, and progress is often not apparent in the short term.

Productive Repetition

Repetition is process-specific. Repeating a useful auditory process can strengthen familiarity, recognition, recovery, and flow. Repeating an inefficient process can also make that process more familiar. Visual decoding, fixation on missed information, repeated stopping and restarting, or excessive conscious reconstruction should therefore not be justified merely because they create more repetitions.

The objective is not repetition for its own sake. Productive repetition rehearses the process LICW wants to become easier and more automatic: hearing complete acoustic patterns, remaining with the stream, recovering quickly, using context appropriately, and communicating meaningfully.

Historical Foundation: The Hierarchy Of Habits

Bryan and Harter's 1899 study described telegraphic expertise as the acquisition of a hierarchy of habits. Recognition of individual characters is one level. Recognition of words and connected language represents higher levels. Progress at the higher levels depends on lower-level operations becoming sufficiently practiced that they no longer consume the same degree of conscious attention.

This historical model closely anticipates a central principle of the LICW Method. Repetition is not intended merely to make the student more accurate at the same conscious task. Its deeper purpose is to change the task itself. As character recognition becomes more automatic, attention becomes available for flow, Word Discovery, context, and meaning.

For that reason, repetition should not be judged only by whether a student can explain more or copy a familiar drill more accurately. Productive repetition reduces the amount of conscious effort required by foundational operations and creates cognitive room for the next level of skill.

From Understanding To Ability

Academic understanding is valuable. Students should understand why characters are learned as complete acoustic sounds, why analytical decoding is discouraged, why flow and recovery matter, and why productive practice is structured as it is.

A student may be able to explain automaticity, Time To Recognize, Instant Flow Recovery, Character Flow Proficiency, and the principles of sound-first learning in great detail while still consciously struggling to recognize incoming code.

This is why repetition is not simply review of something already learned. Repetition is part of the mechanism by which the skill comes into existence.

Instructional Rationale

Well-designed exposure gives the learner another opportunity to rehearse the desired process. Improvement may not be immediately visible, but productive

practice can accumulate familiarity and reduce effort over time. The important qualifier is productive: exposure that repeatedly rehearses analytical decoding, fixation, or other counterproductive habits can reinforce those habits instead.

Progress often appears uneven. Students may experience periods in which measured performance changes little, followed by noticeable improvement. Such periods can reflect consolidation, changing task demands, or ordinary variability and should not automatically be interpreted as failure.

Repetition also supports the transition from conscious effort to automatic processing. Skills that initially require attention and effort gradually become more fluid and require less conscious control. This transition cannot be accelerated beyond certain limits and depends on sufficient exposure over time.

The Beginner Carousel allows students to encounter foundational material repeatedly without penalty, reinforcing sound familiarity and recognition. At the Intermediate and Advanced levels, ongoing weekly classes provide continued exposure and practice under increasingly natural conditions.

Students should not interpret the need for continued productive repetition as evidence that they are failing. Repetition is one of the mechanisms through which familiarity and automaticity develop, provided the repeated process is aligned with the skill being built.

III. RECEIVING OBJECTIVES AND FLUENCY

AP-17 RECEIVING OBJECTIVE AND LISTENING POSTURE

Academic question • How do Conversational Head Copy and Callsigns and Exact Copy differ?

LICW POSITION

Both tasks require ACR, Continuous Flow, Loose Focus, and IFR. The receiving objective changes what must be retained and how success is judged: conversational reception follows meaning; exact reception preserves and verifies specified characters or data.

RESEARCH AND EVIDENCE BOUNDARY

Task distinctions do not establish two different recognition mechanisms. Linguistic expectations can support conversation, but a plausible callsign pattern cannot substitute for unheard arbitrary characters.

INSTRUCTIONAL IMPLICATION

Teach purposeful shifts of listening posture. Keep Callsigns and Exact Copy supplemental, optional, and continuous-entry, supporting rather than replacing the conversational academic program.

RESEARCH AND RATIONALE

Changing The Listening Posture

A central LICW principle is that Conversational Head Copy and Callsigns and Exact Copy share a common flow-based foundation. Both depend on Automatic Character Recognition (ACR), relaxed Loose Focus, continuing reception, and Instant Flow Recovery (IFR). TTR may help describe recognition delay, but it is not a separate skill or the objective of either receiving task.

One Flow Foundation: Loose Focus In Both

Exact Copy may feel more demanding because individual errors can matter. This perception sometimes reflects apprehension, self-monitoring, and fear of a missed character rather than a different perceptual mechanism. Excessive effort may encourage fixation and cause the listener to miss what follows. Exact tasks nevertheless place genuine additional demands on short-term

retention, motor recording, uncertainty detection, and verification. These requirements should be addressed directly without abandoning Loose Focus.

The Receiving Objective Determines Listening Posture

Callsigns and Exact Copy is oriented toward preserving transmitted information whose individual characters matter. Callsigns, serial numbers, arbitrary mixed groups, POTA/SOTA references, unfamiliar names, addresses, coordinates, and formal traffic may need to be recorded and verified. For arbitrary callsigns and mixed groups, linguistic context cannot reliably supply characters that were not received. A recognizable callsign structure is not evidence of the actual transmitted characters.

Short-Term Retention And Recording

When exact information must be preserved, successfully recognized characters or units may be held briefly before being written, typed, logged, or checked. This is purposeful Short-Term Retention, not an attempt to recreate information that was never received. Coordinating recognition, retention, and a durable record is an additional learned skill.

Research on Morse skill distinguishes recognition from written response. Wisher, Sabol, and Kern (1995) discuss more delayed responding in advanced performance; Baddeley's working-memory research provides a broader model of temporary retention; and Guediche and Fiez (2021) relate short-term memory to Morse comprehension. These findings provide relevant context, but they do not establish that accurate information must be heard with a narrower or more effortful focus.

Missed-Copy Fixation, Ifr, And Uncertainty

Missed-Copy Fixation occurs when attention remains on an unsuccessfully received element while new code continues to arrive. It is counterproductive under either receiving objective. Instant Flow Recovery means releasing the attempt to reconstruct the miss during continuing reception and promptly reconnecting with the signal.

The subsequent responsibility differs. During conversation, an unrecovered word may often be released when meaning remains intact. During Exact Copy, a missed character must likewise be released while reception continues, but the resulting information must not be treated as correct. Mark uncertainty, preserve what was actually recognized, and seek repetition, confirmation, or correction when appropriate.

Try, But Don'T Care - And The Responsibility For Exactness

“Try, but don't care” describes sincere receptive effort without emotional attachment to each individual result. It applies to both tasks. Students should try to receive accurately but should not allow an individual miss to interrupt the stream. The phrase does not mean that accuracy is unimportant.

In conversation, continuing comprehension may be the satisfactory outcome despite an isolated miss. In Exact Copy, the result must satisfy the additional requirement of accurate retention, recording, or verification. The operator can remain relaxed during reception and still insist on an accurate final record. In practical terms: release a miss while listening; resolve essential uncertainty before accepting exact information as correct.

Context And The Limits Of Prediction

Word Discovery during meaningful language may benefit from familiar vocabulary, grammar, context, and emerging meaning. But context cannot establish the exact characters of arbitrary callsigns, serials, or mixed groups. Such information must be recognized from the transmitted acoustic patterns and checked when uncertain. Never silently replace an unheard character with an expected one.

Conditioned Response: The Link to Receiving Objectives

The receiving objective influences what an operator does after recognizing a character. Exact-information tasks may require retaining, writing, typing, or logging a particular value; conversational head copy emphasizes retaining and combining recognized material into words and developing meaning. The common recognition foundation and the learned response that follows it are related but distinct capabilities.

Isolated Accuracy And Continuous Flow

Isolated callsign and group exercises can develop component skills. Their success alone does not demonstrate accurate reception throughout a continuing exchange. A complete program bridges isolated exact data, multiple linked fields, ongoing conversations containing exact items, and realistic operating conditions. Throughout, students preserve Loose Focus and IFR.

Callsigns And Exact Copy As Supplemental Guided Practice

The Intermediate and Advanced academic curricula remain focused on Conversational Head Copy fluency and mastery. Callsigns and Exact Copy is an optional, continuous-entry Guided-Practice program that complements

those classes and BootCamp. It is neither a distinct recognition method nor an academic level or prerequisite for advancement.

Students and instructors adapt speed, material, recording demands, retention span, and operating conditions to present proficiency. Classroom sessions demonstrate methods, diagnose limitations, and guide suitable practice; durable progress develops mainly through purposeful independent exercises and on-air application.

Four Dimensions Of Developed Exact Copy

Accuracy means securing required information and acknowledging uncertainty. Speed means doing so at increasingly useful sending rates. Consistency means repeating that performance across attempts and days. Reliability means preserving useful performance under varied material, QRM, weak signals, fatigue, changing fists, and operating pressure. OverLearn consolidates successful behaviors beyond initial success; Periodicity uses a controlled baseline–push–back off–stabilize sequence without turning overspeed into a perfection test.

AP-18 CONDITIONED RESPONSE AFTER RECOGNITION

Academic question • What changes when an operator moves from written copy to head copy?

LICW POSITION

The sound-to-recognition foundation is shared, but repeatedly rehearsed responses can differ. Writing and typing may become automatic recording behaviors; conversational head copy requires increasing ability to retain, combine, and understand recognized sound. The operator should learn both and select according to task.

RESEARCH AND EVIDENCE BOUNDARY

The “imaginary pencil” is a plausible pedagogical interpretation of an observed transitional behavior, not a formally established universal neurological stage.

INSTRUCTIONAL IMPLICATION

Treat imagined writing without shame. Help students progressively sustain meaning without requiring immediate motor transcription while preserving exact recording when needed.

RESEARCH AND RATIONALE

For many operators, years of conventional Morse practice establish a powerful conditioned response: hear a character, recognize it, and write or type it with little deliberate motor planning. Repetition can make the recognition-to-recording association highly practiced. This is useful for Exact Copy, but it does not mean that recording defines all accurate reception.

Conversational Head Copy calls for a different learned response to recognized material: retain it, combine it with what follows, allow words to emerge, and integrate meaning. The educational task is not to erase the useful recording response. It is to develop an additional response and the flexibility to use the one appropriate to the receiving objective.

The Conditioned Response

The recording response is enormously useful when exact information must be preserved. Callsigns, signal reports, serial numbers, traffic, park references, and other critical information may require a durable record. Exact Copy can also involve accurate short-term retention without immediate writing. A well-practiced writing or typing response is an asset when the task calls for it.

Conversational head copy asks the operator to do something different after recognition. Instead of turning each character into an immediate motor response, the operator may retain recognized material, discover familiar word patterns, and follow developing meaning. A strongly established recording habit can compete with that response until both are sufficiently practiced and the operator can shift flexibly.

The Imaginary Pencil As A Transitional Scaffold

This may help explain a behavior commonly reported by operators who are learning head copy: the imaginary pencil. A student may mentally trace letters, imagine writing them, or even make a subtle writing motion with a finger while listening.

Rather than treating this automatically as a failure to head copy, it may be more useful to view it as a transitional scaffold. The learner is drawing on a familiar recognition-to-recording association to support Short-Term Retention while a meaning-centered response develops.

The imaginary pencil may therefore serve as a bridge from a familiar recording response to the more direct retention and comprehension used in head copy. As the learner becomes more comfortable with Word Discovery and meaning, imagined writing may gradually become unnecessary. The real writing skill remains available when Exact Copy requires it.

Copy And Response

The common recognition foundation does not determine a single mandatory response. What happens after recognition depends on the receiving objective and on learned skills for retention, comprehension, motor recording, and verification.

The fundamental difference between Exact Copy and Conversational Head Copy is the receiving objective: preserving exact information or following developing meaning. Recording is an important additional demand in many exact-information tasks, but it is not what defines Exact Copy. Fluent operators learn to shift the response while preserving ACR, Loose Focus, and continuous Flow.

Implications For Exact Copy Training

This framework also sharpens the goal of Exact Copy. Its objective is accurate retention and, where needed, recording and verification of recognized information while maintaining continuous reception. Students develop these

accuracy-centered capabilities on the same ACR and Flow foundation used for Conversational Head Copy.

An operator may recognize Morse more readily than they can record it. A student who cannot type or write a 25 WPM stream may not have an ACR problem. Recognition, retention, Flow, and recording are different possible bottlenecks and should be assessed separately.

Instructors can vary the required response while keeping the acoustic task similar: recognize a callsign without recording, reproduce it after a short delay, and finally record it while reception continues. Identify the limiting skill instead of simply increasing speed.

A Central Principle

Conversational Head Copy and Exact Copy share ACR, Loose Focus, and IFR. Recording is an important learned response when the task demands it, not a different character-recognition method.

AP-19 ANNOTATIVE COPY AND THE TRANSITION TO HEAD COPY

Academic question • When does writing support comprehension and when does it compete with it?

LICW POSITION

LICW distinguishes writing to preserve information already understood from writing every character in order to discover meaning. Brief notes and annotations can support communication. Persistent character-by-character transcription may prevent attention from shifting toward larger units in a conversational task.

RESEARCH AND EVIDENCE BOUNDARY

The guide evaluates instructional practices through existing research and observation; it does not establish a unique writing threshold or claim all notes are detrimental.

INSTRUCTIONAL IMPLICATION

Adapt written notes to the receiving objective. Preserve human short-term retention and Word Discovery where conversational comprehension is the aim.

RESEARCH AND RATIONALE

Sound → Meaning

Head copy does not require every character to be consciously recognized or retained. As in spoken language, individual elements may be missed while the general message remains understandable. Context, rhythm, word discovery, anticipation, and recovery all contribute to comprehension.

Relationship To Short-Term Retention

When exact written copy is required, Short-Term Retention can support accurate transcription by allowing the hand or keyboard to lag slightly while the operator continues listening. The retained material can then be written and verified without requiring attention to abandon the incoming signal.

Sound → Character Recognition → Written Character

Early Morse training research recognized this relationship explicitly. Keller described instruction in which an auditory Morse signal was followed by a pause for the student to write the corresponding character and then receive

confirmation. He later described this first stage of learning in terms of establishing fundamental stimulus-response relationships.

Consequently, a student who has copied thousands of Morse characters may have practiced not only Sound → Character, but also Sound → Character → Writing. Removing the pencil therefore removes both an external memory aid and part of a familiar processing routine.

This helps explain why performance often appears to regress when the pen is first removed. Recognition that seemed dependable during written copy may feel uncertain. Words may disappear before they are understood. Meaning may emerge only in fragments. The student may know the subject of a transmission while remembering very few exact words.

Motor Imagery As An Optional Transitional Scaffold

Some students may benefit temporarily from mentally preserving part of the familiar writing process after physical transcription is removed. Motor imagery is the internal simulation of a movement without actually performing it. Research on handwriting shows substantial overlap between imagined and executed writing processes, and suggests that writing posture and learned movement patterns can influence the experience of imagined writing.

LICW regards this technique as plausible and experimental rather than as established Morse-specific practice. Research supports relationships among handwriting, motor imagery, letter representation, and working memory, but direct evidence that imagined handwriting improves Morse head-copy acquisition has not been established.

Listening Forward During The Transition

Complete annotation can encourage Missed-Copy Fixation because an unfinished word or blank remains visible on the page and invites continued attention. When the pen is removed, the student has an opportunity to develop a different response. The miss is allowed to pass, attention remains forward, and context may later clarify the uncertainty or the missing information may simply remain unknown.

Context And Word Discovery

Direct comprehension becomes possible as the student begins to process Morse code as language rather than as a series of unrelated characters. Head copy permits greater use of familiar vocabulary, common abbreviations,

predictable QSO structure, sentence grammar, topic continuity, rhythmic phrasing, partial-word clues, and conversational context.

For example, when a transmission begins GOOD FI..., the listener may anticipate FIST based on common operating language and context. This is not careless guessing. It is the normal use of linguistic probability. Spoken-language listeners do the same thing continuously.

Word discovery develops when characters begin to combine into recognizable language before the student consciously assembles them one by one. Head-copy practice creates the conditions in which that transition can occur.

Comprehension

Supporting the process: short-term memory helps retain recently received information, while attention and continuity help the operator remain engaged with the unfolding sound stream. This is LICW's simplified conceptual model, informed by Guediche and Fiez; it is not a processing sequence proposed by the authors.

Research Foundation: Morse As Language Comprehension

Research by Guediche and Fiez provides an important scientific perspective on the distinction between Morse recognition and Morse comprehension. Their study of experienced operators separately measured perceptual fluency - the ability to recognize and transcribe incoming Morse - and the ability to comprehend complete Morse sentences. Strong perceptual fluency alone did not fully account for differences in comprehension. Short-term-memory performance predicted comprehension even after differences in perceptual fluency were taken into account.

The distinction is significant to the LICW Method. Character recognition is necessary, but it is not the endpoint of fluent Morse reception. The instructional emphasis must progressively shift from serial character recognition toward integrated language comprehension, supported by flow, Instant Flow Recovery, Character Flow Proficiency, word discovery, listening forward, and conversational head copy.

The study should not be interpreted as demonstrating that short-term-memory exercises themselves will improve Morse comprehension, nor does it prescribe a particular method for teaching head copy. Its importance to the LICW Method is explanatory rather than prescriptive: it provides evidence that character recognition and language comprehension are distinguishable

capabilities and helps explain why the transition from one to the other requires more than simply increasing character speed.

Research reference: Guediche, S., & Fiez, J. A. (2021). Comprehension of Morse code predicted by item recall from short-term memory. Journal of Speech, Language, and Hearing Research, 64(9), 3465-3475.

Retention And Meaning

The Method therefore distinguishes among verbatim retention, which supports exact transcription; detail retention, which supports logging and recollection; and meaning retention, which supports conversation and response. Head copy emphasizes meaning retention. Note taking may support detail retention when necessary.

Progress Measures

These measures may improve before recognition percentages improve. Limited verbatim recall should not be interpreted as lack of progress when continuity, meaning, and recovery are strengthening.

Risks Of A Premature Or Poorly Framed Transition

Poor framing may lead to panic when words are missed, self-judgment, premature return to full annotation, avoidance of stretch material, belief that the student lacks aptitude, reduced class participation, or withdrawal from the learning process.

Relationship To The Curriculum

The Advanced curriculum increasingly expects students to understand longer and denser communications directly, using selective note taking only when operationally useful. Bootcamp may accelerate this transition by creating an immersive environment in which students repeatedly practice listening forward, letting misses go, remaining with the stream, and following meaning without relying on complete transcription.

AP-20 FUNCTIONAL AND COGNITIVE FLUENCY

Academic question • What is the difference between useful operation and lower-effort comprehension?

LICW POSITION

Functional fluency permits useful CW exchange, potentially with effortful transcription or supported protocols. Cognitive fluency increasingly allows continuous language to be understood with less deliberate assembly. Both are meaningful milestones.

RESEARCH AND EVIDENCE BOUNDARY

The concepts are useful educational descriptions, not a laboratory-certified classification tied to fixed WPM cutoffs.

INSTRUCTIONAL IMPLICATION

Celebrate real operation while also offering development toward effortless conversational comprehension and advanced endurance.

RESEARCH AND RATIONALE

Functional Fluency

Functional Fluency is the ability to operate effectively in Morse code while some substantial conscious processing may still be present. The operator can send, receive, sustain continuity, recover from misses, and complete real QSOs, but understanding may still depend partly on active word construction, annotation, deliberate retention, or focused attention.

Functional Fluency is a meaningful achievement. It supports successful ragchewing, POTA and SOTA, contests, nets, traffic handling, and many other forms of real operating. It should not be treated as an inferior or incomplete form of CW simply because some cognitive effort remains visible to the operator.

Cognitive Fluency

Cognitive Fluency describes the region of the continuum in which recognition and language processing have become sufficiently familiar that words, phrases, and meaning increasingly emerge without deliberate character-by-character construction. Word Discovery becomes more prominent, attention is less burdened by recognition, and sustained conversational copy becomes easier and more durable.

Cognitive Fluency does not require perfect automaticity, perfect copy, or a particular subjective experience. Some operators report inner speech, some report visual imagery, and others simply experience meaning. The relevant change is decreasing dependence on conscious assembly as the route to comprehension.

Research Foundation

Bryan and Harter's hierarchy of habits provides an early framework for understanding why expertise changes the functional unit of performance: lower-level operations become sufficiently automatic that attention can be used for words, phrases, and meaning. Guediche and Fiez provide a modern Morse-specific distinction between perceptual fluency and comprehension, showing that accurate transcription does not fully explain the ability to understand meaningful Morse.

LICW's Functional/Cognitive Fluency continuum is a synthesis built from those observations, modern classroom experience, and the club's developmental model. It should not be represented as an experimentally validated scale from any one study.

Relationship To The Continuous Developmental Model

The Path to Proficiency builds the sound-first and operating foundation on which fluency can develop. The Path to Fluency, from INT1 through ADV1, is where students move progressively from effortful continuous processing toward increasingly natural conversational communication. Functional Fluency may emerge well before direct comprehension is effortless; Cognitive Fluency deepens gradually as flow, recovery, Word Discovery, and automaticity strengthen.

Relationship To Listening Posture

Fluency does not eliminate the need for Exact Copy. An operator who understands conversation directly may still direct attention toward exact information, use Short-Term Retention, and write or verify critical information when a callsign, serial number, coordinate, or formal message requires precision. Conversational material then permits a return to Loose Focus and meaning-centered listening.

AP-21 MEASUREMENT AND STUDENT PROGRESS

Academic question • Which indicators meaningfully reflect development?

LICW POSITION

LICW uses measurement to support learning rather than convert progress into a race. WPM, accuracy, response time, flow stability, recovery, comprehension, retention, operating confidence, and exact-information reliability illuminate different dimensions.

RESEARCH AND EVIDENCE BOUNDARY

No single metric can serve as a direct measure of automaticity or fluency. Timed responses often include motor and decision demands.

INSTRUCTIONAL IMPLICATION

Use multiple observations and learner goals; avoid universal TTR thresholds, promotion by calendar, and discouraging comparisons.

RESEARCH AND RATIONALE

Background

Progress in Morse code is often described in terms of words per minute (WPM) and copy accuracy. While these measures are useful in a limited sense, they do not fully capture the development of real-world operating ability.

An exclusive focus on speed or accuracy can lead to misunderstandings about what constitutes meaningful progress and can encourage practices that are inconsistent with the development of continuous auditory processing.

LICW's position is that progress in Morse code learning should be evaluated through increasingly Automatic Character Recognition (ACR), sustained Flow, and functional communication under real-time conditions, rather than on speed, recognition latency, or isolated accuracy alone.

Words per minute is a descriptive measure of operating conditions, not a complete measure of proficiency. Similarly, high accuracy in controlled conditions does not necessarily indicate the ability to operate effectively in real time.

Time To Recognize (TTR) describes one aspect of the recognition process. A shorter delay may accompany growing automaticity, but it does not by itself establish Flow, comprehension, or accurate Exact Copy. Timed drill results

often include recognition, retention, and motor-response demands; instructors should interpret them as task performance rather than a pure recognition-latency measurement.

Instructional Rationale

Speed and accuracy can be influenced by conditions that do not reflect real operation, such as extended spacing, short or predictable material, or repeated exposure to the same content. These conditions may produce the appearance of progress without corresponding gains in functional capability.

By contrast, the ability to recognize Morse with progressively less deliberate effort, remain engaged with a continuous stream, tolerate imperfection, and maintain forward motion under natural timing reflects genuine skill development.

Progress in these areas is often gradual and may not be immediately visible. Students may experience periods in which their measured speed appears unchanged while underlying processing improves. Over time, these improvements support increased fluency and operating capability.

At the Beginner level, progress is reflected in increasing familiarity with sound patterns and the ability to remain engaged with short sequences.
At the Intermediate level, progress is reflected in sustained continuity, improved recovery, and the emergence of word-level comprehension.
At the Advanced level, progress is reflected in real-time CW fluency and the ability to operate comfortably under natural conditions.

Students should avoid focusing exclusively on speed or accuracy as indicators of success. These measures can be useful for context, but they should not be treated as the primary objective.

Instructors should reinforce the broader definition of progress and avoid pressure to meet specific speeds or response-time targets within fixed timeframes. Evaluation should include observable improvements in automatic acoustic recognition, continuity, appropriate responses, and recovery.

AP-22 ON-AIR READINESS AND PARTICIPATION

Academic question • When should a student begin real CW operating?

LICW POSITION

The purpose of LICW teaching is practical CW communication. Supported early operating builds familiarity with variability, procedure, rhythm, recovery, and the satisfaction of participating in an on-air community.

RESEARCH AND EVIDENCE BOUNDARY

Real QSOs are valuable training conditions, but one contact cannot demonstrate general proficiency across all tasks.

INSTRUCTIONAL IMPLICATION

Encourage simple supported contacts, POTA hunts, club activities, appropriate nets, and mentoring before a student believes that perfect classroom copy is necessary.

RESEARCH AND RATIONALE

Background

Many students view on-air operation as a milestone that occurs after training is complete. This perspective separates learning from operating and often leads students to delay their first contact until they believe they are sufficiently proficient.

This separation is inconsistent with the nature of Morse code as a real-time communication skill. Proficiency develops through exposure to actual operating conditions, not in isolation from them.

Instructional Rationale

Exposure to these conditions reinforces the skills developed in instruction, particularly continuity, recovery, rhythm, confidence, and the ability to keep moving when copy is imperfect.

Delaying on-air experience can slow development by limiting exposure to these conditions. Conversely, forcing students onto the air before they are prepared to maintain basic continuity can increase anxiety and reduce confidence.

For this reason, on-air readiness is guided, but not prescribed. Students should be encouraged to begin operating when they feel capable of remaining engaged with the incoming code, even if their copy is incomplete.

Relationship To The LICW Curriculum

At the Beginner and early Intermediate levels, activities that emphasize structured exchanges and supportive operators provide an appropriate entry point. At the Intermediate and Advanced levels, operating supports the development of real-time CW communication and the application of flow-based skills under natural conditions.

Different operating activities may emphasize different skills. A casual QSO, a net check-in, a POTA exchange, a Field Day contact, a contest exchange, and formal traffic handling do not all require the same operating habits. However, they all benefit from the same foundation: sound-first recognition, continuity, recovery, rhythm, and confidence under real conditions.

Implications For Students And Instructors

Students should view on-air activity as part of their learning process rather than as a test of readiness. Early experiences should be approached with the expectation of imperfection and used to build familiarity and confidence.

Instructors should encourage on-air participation without imposing rigid requirements or timelines. Guidance should focus on helping students recognize when they are capable of maintaining continuity and managing the demands of real-time communication.

Instructors should also recognize that students may be drawn to different types of operating. The role of instruction is not to direct every student toward the same operating destination, but to help each student develop the underlying CW skills needed to participate confidently in the activities that interest them.

Relationship To Cultural And Governance Continuity

This section addresses the academic role of operating in Morse code development. The cultural standard for encouraging on-air activity without pressure, embarrassment, or artificial deadlines is addressed in The LICW Culture Guide.

AP-23 COGNITIVE FATIGUE AND OPERATIONAL WORKLOAD

Academic question • How should fatigue and concurrent task demands influence CW teaching?

LICW POSITION

LICW regards sustainable pacing, situation awareness, and recovery as part of operational skill. Workload may be aggravated by simultaneous copying, logging, sending, interference, and managing the station. Operators should recognize a decline and adjust demands.

RESEARCH AND EVIDENCE BOUNDARY

Aviation and general cognitive-fatigue research provides analogy and conceptual support, not direct experimental estimates of CW-specific fatigue thresholds or exact break protocols.

INSTRUCTIONAL IMPLICATION

Teach slowing down, pausing CQ, simplifying the workload, or taking a break; do not glorify uncontrolled overload or equate endurance with contact rate.

RESEARCH AND RATIONALE

Background

CW is a continuous performance activity. During a busy activation, net, contest, or extended QSO, an operator must recognize incoming code, retain exact information when necessary, select a response, send accurately, manage logging, and control the rhythm of the exchange. These demands overlap. Practice and automaticity reduce the effort required by individual components, but they do not eliminate the attentional demands of coordinating the entire task.

An Illustrative On-Air Observation

This observation is not a controlled experiment and does not establish a 30-minute fatigue threshold. It does, however, illustrate an important pattern: reception, sending, pacing, and the subjective sense of control can deteriorate together. The relevant question is not merely whether the operator can maintain the QSO rate, but whether performance remains accurate, coordinated, and sustainable.

From Proactive To Reactive Operating

When an operator is ahead of the exchange, there is sufficient spare attention to anticipate the next step, maintain a natural sending rhythm, verify information, and recover without urgency. When the operator becomes reactive, attention is increasingly consumed by the present demand. The operator may feel compelled to answer immediately, accelerate the exchange, or concentrate harder on recognition while losing the broader rhythm of operating.

Relationship To Automaticity, Loose Focus, And Flow

Loose Focus remains the LICW default posture for maintaining receptive auditory flow. It is not inattention or a refusal to verify critical information. The operator changes listening posture according to the receiving objective while avoiding unnecessary tension and Missed-Copy Fixation. When operating quality deteriorates, the initial response should not automatically be to increase intensity or push speed. Often the more productive response is to restore manageable workload and natural rhythm.

Application To Conversational Head Copy And Exact Copy

In conversational operating, deterioration may appear as reduced comprehension, difficulty following the exchange, missed transitions, or excessive effort devoted to individual characters. In POTA, contesting, and traffic handling, it may appear as repeated callsign fills, incorrect reports or serial numbers, logging mistakes, transcription difficulty, or loss of disciplined net procedure. In both cases, sending rhythm and coordination may deteriorate even when the operator knows exactly what should be sent.

Exact copy requires verification of essential information, not relentless conscious scrutiny of every sound. A request for a fill or repeat is an appropriate operating action when the information is uncertain. The goal is to preserve accuracy and continuity through good procedure rather than force uninterrupted performance despite mounting errors.

Recognizing Deterioration

Recognition begins requiring noticeably greater conscious effort at a familiar operating speed. Sending becomes less smooth, with unusual spacing, mistimed characters, or errors in well-practiced material such as one’s own callsign. The operator begins rushing exchanges, interrupting a natural rhythm, or reacting rather than anticipating. Calls, reports, or logged information require more frequent correction or verification than usual. The

operator becomes preoccupied with a missed item, loses track of the next step, or becomes unusually frustrated. Attention narrows to one part of the task while logging, timing, or other operating responsibilities are neglected.

Workload Management And Recovery

Managing workload is an operating skill, not a concession of inadequate proficiency. When warning signs appear, the operator should deliberately restore control over the tempo of the activity.

Reduce avoidable task demands, simplify procedures, and use familiar logging and operating routines. Request repeats or fills when essential information is uncertain. Do not substitute guesses for verification.

Pause briefly, stand by, or take a genuine break when quality or control is slipping. Resume at a manageable pace rather than attempting to recover the previous QSO rate.

Assessment And Evidence Boundaries

Operating endurance should not be reduced to a single WPM score, QSO count, or session duration. Useful observations may include the stability of copying and sending, number and nature of corrections, ability to maintain rhythm, subjective workload, and the operator's response to a deliberate reduction in pace.

If instructors explore this topic through guided practice or operating exercises, comparisons should be made cautiously. A single busy activation cannot establish whether an observed change came from fatigue, a sudden increase in task demand, propagation, interference, equipment, or other conditions. Short breaks and progressive training are reasonable instructional strategies, but LICW should not claim a precise fatigue threshold or a proven CW-specific recovery protocol without corresponding evidence.

Research on sustained cognitive work supports treating fatigue and concurrent-task demands as relevant human-performance considerations. Aviation human-factors literature also describes deterioration in attention, timing, and coordination under fatigue and high workload. These sources provide a useful conceptual foundation, but they are not direct experimental validation of the specific effects or time course of fatigue in amateur-radio CW operating.

IV. CLASSROOM PRACTICE, TECHNOLOGY, AND CONTINUITY

AP-24 INSTRUCTOR JUDGMENT AND RECEIVER FEEDBACK

Academic question • What makes feedback authentic while preserving flow and student dignity?

LICW POSITION

Instructors should be responsive to students and reinforce communication rather than teach to an inflexible script. Where suitable, feedback on sending should come from what listeners actually received before the sender announces what was intended.

RESEARCH AND EVIDENCE BOUNDARY

Receiver-based feedback is an LICW recommended practice, not an obligatory script for every sending exercise. The instructor decides when to continue, request a resend, or clarify based on the instructional objective.

INSTRUCTIONAL IMPLICATION

Ask “What did we receive?” without putting individuals on the spot. Keep feedback brief and useful; do not require 100-percent reconstruction when the message was adequately understood.

RESEARCH AND RATIONALE

Classroom Civility And Controversial Topics

At the same time, instructors and club representatives have a responsibility to protect the learning environment when conversation moves into areas that may divide, pressure, exclude, or make members feel unwelcome.

Instructors are empowered to act when conversation moves in a direction that is inconsistent with the LICW learning environment. In many cases, a simple redirection is enough.

At the same time, instructors should not allow a desire to be polite to prevent them from acting when action is needed. A calm, clear redirection is often the kindest response because it protects everyone in the room, including the person who may have unintentionally crossed a line.

General Conduct Of Class

Throughout class, brief reflective check-ins may be helpful. Asking students what is working, what is difficult, or how they respond when flow breaks can build self-awareness and normalize the learning process.

Level-Specific Instructional Guidance

INT1 remains transitional in character. It should strengthen rhythm retention, early flow, and confidence with short words and sequences while moving students away from predictable Beginner Carousel patterns and toward a more dynamic learning environment.

Instructors may design sessions around head copy, natural comprehension, rhythm-driven copy, higher-speed operating practice, or other advanced practice formats that are appropriate to the students present.

Communication And Feedback

After practice segments, instructors should help students notice what is changing in their experience: smoother recognition, better continuity, quicker recovery, less tension, greater confidence, or stronger rhythm.

Receiver-Based Feedback In Sending Exercises

Sending practice should be treated as communication, not merely as the physical production of Morse characters. Effective sending should be judged not only by character formation, rhythm, and spacing, but also by whether the transmission was reasonably copyable and whether meaning reached another operator.

Receiver-based feedback is a recommended instructional practice rather than a required classroom script. Instructors retain discretion to determine when and how it should be used based on the purpose of the exercise, the experience of the students, the size and character of the class, available time, and the instructor’s assessment of what will be most productive. The central objective is to preserve authentic feedback whenever practical and to keep sending instruction focused on successful communication.

Why Receiver Feedback Is Unique

The sender’s own impression of the transmission is useful, but it is necessarily incomplete. Because the sender already knows the intended message, the mind may supply the expected character, spacing, or word even when the transmitted result was less clear. The sender hears the code with the benefit of intention. The receivers encounter the transmission without knowing what

was intended and can report only what they actually received. The sender can report what was intended. Only the receivers can report what they received.

The Sender'S Responsibility For Effective Communication

Good sending certainly depends on character formation, timing, spacing, and rhythm. As students progress, however, effective sending also depends on composition. Shorter sentences, familiar vocabulary, natural phrasing, predictable structure, and useful context can make a message much easier to receive.

For example, a long, densely composed transmission with unusual words and little context may be difficult to understand even when every character is formed correctly. A clearly structured message using natural language may be easier to follow at the same speed.

Classroom Application

Receiver-based feedback should remain brief enough to preserve the rhythm of the class. The instructor should normally identify one useful pattern or one actionable adjustment, allow the student to resend when appropriate, and then continue the exercise. The purpose is to create a concise communication loop, not a detailed critique after every transmission.

LICW Instructional Position

This is a recommended instructional practice, not an inflexible rule. The instructor retains discretion to adapt the approach when the objective of the exercise, the needs of the students, classroom dynamics, or available time make another method more appropriate.

Conduct Of Briefings

When students are already well oriented and would benefit more from practice time, instructors may appropriately omit the briefing altogether. This is a matter of instructional judgment.

Use Of The Morse Practice Page And Word List Trainer

In the Beginner Carousel, MPP is especially useful because it provides precise, standardized code generation and helps ensure that new students hear consistent sound patterns during the earliest stage of learning. Its accuracy and uniform pacing reduce distractions and support the formation of correct sound associations.

Limited demonstrations of MPP or WLT may still be appropriate when a specific instructional goal is being served, especially when helping students learn how to use those tools effectively for independent practice.

AP-25 LIVE INSTRUCTION, PRIVACY, AND RECORDING

Academic question • Why does LICW favor live and private academic classes?

LICW POSITION

LICW maintains live, interactive academic classes so students can practice, make mistakes, and receive immediate feedback within an environment of trust. LICW policy prohibits unapproved class recordings and automated transcripts or AI note-taking in academic classes.

RESEARCH AND EVIDENCE BOUNDARY

This item straddles academic rationale and controlling administrative policy. Actual enforcement and accessibility authorization must follow the current LICW policies and governance instruments, which may change independently of the method.

INSTRUCTIONAL IMPLICATION

Preserve real-time learning and refer accommodations or unauthorized automation concerns through established club procedures. Do not copy operational sanctions into a timeless research claim.

RESEARCH AND RATIONALE

Background

Modern learning environments often rely on recorded content for convenience and scalability. It is therefore natural for students to request recordings of classes or for organizations to consider building libraries of recorded instruction.

The LICW Method is based on live, interactive instruction, immediate feedback, guided practice, and the development of real-time auditory processing skills. That kind of learning is best supported in a live class where instructors can guide students in real time, respond to what is happening, and help students stay in flow.

A recorded, transcribed, or summarized class may preserve words or content, but it does not preserve the instructional environment that makes the class effective. It cannot reproduce the instructor’s real-time judgment, the adjustment of difficulty, the correction of rhythm and timing, or the encouragement that helps students recover from mistakes and remain engaged.

They must be able to do these things without concern that their participation is being captured, preserved, analyzed, or distributed outside the live class environment.

Recording changes behavior. When participants know they are being recorded or automatically transcribed, they often become more self-aware and cautious. This can lead to reduced participation, hesitation in asking questions, avoidance of risk-taking, and reluctance to make mistakes openly.

These effects are subtle but significant. They can interfere with growth, especially in a skill that depends on repetition, experimentation, recovery, and confidence through imperfection.

Ai Note-Taking, Transcription, And Meeting-Summary Tools

Even when these tools are described as note-taking rather than recording, they may capture, preserve, summarize, analyze, process, retain, or distribute class content. This may include student questions, copying attempts, mistakes, instructor feedback, chat comments, names, voices, and other class interactions.

Members may not enable, invite, launch, or use these tools in LICW academic classes unless specifically authorized by LICW for an approved accessibility, administrative, or instructional purpose.

This policy is not intended to prevent ordinary personal note-taking by students. Students may take their own private handwritten or typed notes for learning purposes. The concern is automated capture or processing of class activity in a way that changes the privacy, comfort, and trust of the learning environment.

AI note-taking tools create the same instructional and privacy concerns as recordings. They may make students less willing to ask questions, make mistakes, experiment, or participate openly. They may also create the impression that a class can be reduced to a transcript or summary, when the value of LICW instruction lies in live interaction, immediate feedback, guided practice, and the development of real-time listening skill.

The Role Of Live Instruction

In a live class, the instructor can hear how a student is copying or sending, identify emerging errors or inefficiencies, adjust pacing and content in real time, guide the student back into flow, and reinforce recovery after misses.

Why Recorded Classes Are Not A Substitute

When students practice without guidance, they risk reinforcing incorrect patterns, including improper timing, analytical decoding habits, inconsistent rhythm, loss of flow, and poor recovery habits.

Live instruction reduces this risk by ensuring that practice is observed, guided, and corrected in real time. Recorded instruction, by contrast, can unintentionally encourage unsupervised repetition of errors.

For that reason, LICW prioritizes live participation over convenience. The decision not to provide recorded academic classes is not an operational limitation. It is an intentional part of the curriculum design.

Accessibility Considerations

When a student requires assistance with note-taking, hearing, comprehension, disability access, or another learning-related need, LICW should consider the specific need and the least intrusive way to support access while preserving the privacy and instructional integrity of the class.

If a student has an accessibility need that may require an exception, the student should be referred to LICW leadership so an appropriate accommodation can be considered. Individual instructors should not be expected to evaluate or approve these tools during class.

AP-26 MORSE DECODERS AND INDEPENDENT LEARNING

Academic question • When can a decoder help and when does it interfere with skill development?

LICW POSITION

LICW does not moralize decoder use or call it cheating. A decoder can help accessibility and may verify uncertain copy or provide limited post-exercise sending feedback. Continuous reliance on a printed output stream, however, replaces the listening work that builds independent auditory recognition and flow.

RESEARCH AND EVIDENCE BOUNDARY

The precise effects of decoder use depend on goal, frequency, and context; the source offers a reasoned instructional position, not a quantified experimental model of dependency.

INSTRUCTIONAL IMPLICATION

Separate on-air accommodation from deliberate auditory practice; encourage students to listen first and use machine text as a secondary aid where appropriate.

RESEARCH AND RATIONALE

Background: Why This Guidance Is Now Necessary

LICW's academic concern is practical rather than ideological. When a decoder becomes the primary source of meaning, the student's attention is drawn away from sound and toward printed text. That shift interrupts the repetitions the brain needs in order to develop Morse code as sound, preserve continuity through uncertainty, and build independence from deliberate character-by-character construction.

The Pro-Decoder Argument

A decoder can function like a quiet Elmer beside the operator. It can reduce anxiety, help confirm uncertain information, and make early on-air participation feel more achievable.

The Counter-Argument

When a decoder becomes the primary source of meaning, the student is no longer required to remain in the stream through incomplete copy, tolerate misses, or reconstruct meaning from context.

Continuous decoder reliance weakens sound-first pattern recognition, reduces the development of Instant Flow Recovery, and suppresses the transition from decoding toward flow, word discovery, and conversational comprehension.

A second concern is dependency. When conditions degrade, fists vary, timing becomes irregular, or noise intrudes, the operator who has relied on a decoder often lacks the internal skill required to compensate.

LICW Principle: Decoders Are Not “Cheating,” But They Are Often Training-Negative

Over time, instructors have consistently observed that when a decoder becomes the primary source of meaning, the student’s auditory processing, continuity, recovery, and word-discovery skills do not fully develop. While this is not a formal study, it is a repeated and consistent outcome across many students and instructional settings.

Decoders may be valid accessibility supports, occasional verification tools, and limited sending-feedback tools. They should not be treated as a normal or effective learning pathway for students whose goal is to develop independent CW skill.

When a decoder becomes the primary source of meaning, it displaces the core developmental loop: hearing Morse code as sound, remaining in the stream through loss, recovering instantly after misses, and reconstructing meaning from context.

Accordingly, for students seeking proficiency, routine reliance on a decoder should be strongly discouraged. A decoder may support participation, but it does not teach the brain to copy Morse code.

In the Path to Fluency, students must strengthen Automatic Character Recognition (ACR) in continuous Flow, develop Instant Flow Recovery, and move toward Word Discovery and conversational comprehension.

In the Path from Fluency to Mastery, operators may use tools selectively under difficult conditions, but continued growth still depends on direct engagement with sound, continuity, and meaning.

When Decoders May Be Of Value

A decoder may serve as an operating aid when the cost of an error is unusually high, such as confirming a callsign or number. It may reduce anxiety for a new operator during early on-air activity, provided it does not become the primary source of meaning.

Decoders may also be used as verification tools after a practice session or QSO. In that role, the student listens first, attempts copy internally, and then uses the decoder only to confirm uncertain items.

Decoders may also have limited value as feedback tools for sending practice. Used after a short sending exercise, a decoder can help a student identify whether spacing, rhythm, and character formation are clear enough to be recognized consistently. This use is different from relying on a decoder to receive Morse code. The decoder is not replacing listening or becoming the source of meaning. It is being used as a check on the student's transmitted code.

This use should remain limited and purposeful. The goal is clean, well-timed, human-readable CW, not merely machine-readable output. Instructor feedback and human copy remain the preferred standard, but a decoder can provide useful supplemental feedback during independent sending practice.

Potential Downfalls Of Decoder Reliance

When students read printed decoder output while listening, attention is drawn away from sound and toward text. This weakens auditory pattern recognition and interrupts the development of flow.

A third danger is the loss of training stimulus. Missing, staying in the stream, recovering, and reconstructing meaning are not failures. They are the mechanisms through which proficiency develops.

AP-27 EVALUATION OF NEW TOOLS AND IDEAS

Academic question • How should LICW assess proposed technologies and innovations?

LICW POSITION

LICW should welcome useful ideas and pilot them thoughtfully while judging whether they support sound-first learning, flow, recovery, comprehension, live interaction, accessibility, and student experience. Novelty alone is not a benefit.

RESEARCH AND EVIDENCE BOUNDARY

An encouraging demonstration is not evidence of general efficacy. Academic permission does not authorize member-data access, platform changes, recordings, expenditure, or intellectual-property use.

INSTRUCTIONAL IMPLICATION

Define the educational problem, try a bounded evaluation, collect instructor and student experience, and route administrative matters through governance.

RESEARCH AND RATIONALE

Background

Instructional tools and learning resources continue to evolve rapidly. Artificial intelligence, AI-assisted development tools, automation platforms, and web-based learning applications now make it possible for instructors, students, and members without formal software-development backgrounds to create useful prototypes, practice tools, and learning resources.

This creates important opportunities for LICW. Good ideas may come from members who understand the student experience directly, from instructors who see recurring learning challenges, or from volunteers who recognize a way to make practice, class preparation, communication, or student support more effective.

At the same time, new tools should not be adopted simply because they are new, convenient, or impressive. Some may support the LICW Method, while others may unintentionally weaken it by encouraging visual decoding, passive learning, overreliance on transcripts, excessive automation, reduced live interaction, or a focus on measures that do not reflect real fluency.

For that reason, LICW Academics should remain open to new ideas while evaluating them carefully. New tools and ideas should be welcomed, examined, tested where appropriate, and judged by their effect on learning, instruction, and the member experience.

LICW Academic Position

The central question for LICW Academics is not whether a tool is traditional or new. The central question is whether it helps students develop sound-first recognition, flow, continuity, recovery, real-time comprehension, CW fluency, and eventual mastery in a manner consistent with the LICW Method.

Role Of The Instructor Meeting

LICW instructors are an especially valuable review and test group because instructors understand the LICW Method, observe student progress directly, and can evaluate whether a proposed tool supports or conflicts with the club's instructional principles.

When appropriate, new ideas may be introduced first as demonstrations, limited trials, or instructor-reviewed prototypes before being recommended more broadly to students or members. This allows LICW to encourage creativity while preserving academic consistency.

Academic Evaluation Questions

LICW does not need a rigid approval process for every idea. However, tools or resources that may affect instruction, curriculum, student practice, accessibility, privacy, or official LICW instructional recommendations should be evaluated thoughtfully before broad use.

AP-28 GUARDRAILS AGAINST INSTRUCTIONAL DRIFT

Academic question • Which practices lie outside the intended LICW learning pathway?

LICW POSITION

The method rejects dot/dash visual and mnemonic character-learning paths, prolonged artificial spacing that undermines flow, repeated stop-and-dissection copy, perfection as a central objective, and decoding tools that displace listening. Instructor freedom concerns execution, not contradiction of these principles.

RESEARCH AND EVIDENCE BOUNDARY

A guardrail is LICW's institutional instructional decision, not proof that every learner experiences the same effect. Accessibility and task-specific alternatives require sound judgment.

INSTRUCTIONAL IMPLICATION

Distinguish non-negotiable foundations from preferred practices and optional exercises. Communicate this without shaming students or discouraging innovation.

RESEARCH AND RATIONALE

Background

In a large instructional environment with many instructors, variation in teaching style is both natural and appropriate. However, variation in method can lead to inconsistent student experiences and may undermine the effectiveness of the curriculum.

Instructional drift often occurs gradually and with good intentions. Instructors may reintroduce familiar techniques, respond to student frustration by modifying pacing or method, or emphasize practices that appear helpful in the short term but are inconsistent with long-term skill development.

No Visual Or Mnemonic Character-Learning Pathway

The LICW Method teaches Morse code as sound. Students are not taught to learn characters through visual dot/dash patterns, printed code charts, code trees, visual associations, or mnemonic devices.

No visual system is used as the method for learning, recognizing, or decoding Morse characters. While ordinary written letters may appear as labels,

answers, prompts, or reference points in instructional materials, they are not used as the pathway by which Morse characters are learned. The written letter identifies the meaning of the sound; it does not replace the sound as the object of learning.

LICW does not use mnemonics, memory phrases, pictures, or verbal tricks to associate characters with dot/dash patterns. These approaches may appear helpful early, but they introduce an extra translation step between sound and recognition. That step can delay recognition, encourage analytical decoding, and interfere with the development of ACR and continuous Flow.

The goal is direct auditory recognition. Students should learn to hear the Morse character as a complete sound pattern and associate that sound directly with meaning, without relying on an intermediate visual, verbal, or mnemonic conversion process.

Instructional Rationale

When methods diverge, students may receive conflicting messages about how to approach the code. This can lead to confusion, reduced confidence, and the adoption of inefficient habits that must later be unlearned.

Visual and mnemonic methods are especially problematic because they may produce short-term recognition while slowing the development of true auditory processing. A student may appear to “know” a character, but if recognition depends on mentally recalling a chart, picture, phrase, or dot/dash sequence, the student has not yet developed the direct sound-to-meaning pathway required for flow.

These guardrails are not intended to limit instructor judgment. They are intended to ensure that instructor judgment is exercised within a set of principles that supports the long-term objectives of the program.

Role Of Instructor Judgment

Within these guardrails, instructors are encouraged to apply their judgment, adapt to the needs of their students, and bring their own experience and style to their teaching.

Relationship To The LICW Curriculum

These guardrails apply across all levels of instruction. They ensure that students encounter a coherent approach as they move through the curriculum, from Beginner through Advanced levels.

They also support the integration of other instructional elements, including flow-based learning, repetition, and on-air activity, by maintaining alignment across all components of the program.

AP-29 ACADEMIC CONTINUITY AND RESPONSIBLE CHANGE

Academic question • How should future LICW leaders preserve the method while improving it?

LICW POSITION

The method is preserved through documented rationale, instructor development, consistent terminology, carefully evaluated changes, and ongoing observation of student experience. Evolution is welcome when it solves real problems without undermining foundational sound-first principles.

RESEARCH AND EVIDENCE BOUNDARY

Attendance or engagement observations can identify questions worth investigating, but do not alone demonstrate why a particular teaching practice succeeds or fails.

INSTRUCTIONAL IMPLICATION

Record proposed changes, run pilots when possible, reconcile effects across institutional publications, and separate academic authority from organizational governance.

RESEARCH AND RATIONALE

Background

LICW has developed its instructional model through years of classroom experience, observation, and refinement. Many of its core practices - flow-based learning, sound-first recognition, continuous curriculum structure, and communication-driven instruction - have proven effective across a wide range of students.

Approach To Future Changes

Innovation is not only permitted, but expected. LICW has always improved by observing students carefully, learning from experience, and being willing to adjust when a better path becomes clear. Future curriculum changes should continue in that spirit: open to new ideas, grounded in evidence and student outcomes, and aligned with the principles that make the LICW Method effective.

Use Of Attendance Data As An Academic Quality Indicator

Attendance should not be treated as the only measure of class quality. A low-attendance class is not automatically a poor class, and a high-attendance class is not automatically a better class. However, attendance trends can provide useful information when considered over time and in context.

Attendance data is most useful when viewed as a trend rather than as a single measurement. A temporary drop in attendance may reflect holidays, seasonal travel, competing club activities, or normal variation. A sustained pattern, however, may warrant closer examination.

The ideal class size also differs according to the type and purpose of the class. Some classes are most effective with smaller numbers. For example, a dedicated sending class may work best with approximately six students, allowing each student enough time to send and receive meaningful instructor feedback.

Other classes benefit from larger participation. As students move into higher levels, larger classes can provide more varied listening experiences, a wider range of sending styles, and more natural conversational energy. In many Intermediate and Advanced classes, a larger group may strengthen the learning environment, provided the instructor can still maintain focus, participation, and useful feedback. At the upper end, approximately 18 to 20 students may be a healthy and effective class size for certain higher-level offerings.

Attendance data should be used with judgment and care. It should inform conversation, not replace it. When attendance raises concerns, the appropriate response is not assumption or criticism, but inquiry: review the class purpose, speak with the instructor when appropriate, consider student needs, and determine whether any adjustment would better serve the curriculum.

Used properly, attendance data helps LICW remain responsive without becoming reactive. It allows the club to preserve strong offerings, right-size underused ones, identify emerging demand, support instructors, and ensure that academic resources remain aligned with student learning and the long-term health of the LICW Method.

Role Of Instructor Selection

LICW values CW ability, but raw CW skill alone is not the primary qualification for instruction. The strongest instructors are not necessarily the fastest

operators or the most technically accomplished CW practitioners. They are the instructors who can meet students where they are, explain ideas clearly, encourage without pressuring, correct without discouraging, and help students remain engaged through frustration, missed copy, plateaus, and uncertainty.

Humility

These qualities matter because LICW instruction is not simply the transfer of CW knowledge from a skilled operator to a less experienced student. It is a relationship of encouragement, guidance, patience, and trust. Many of LICW's best instructors are people who were helped by the club, experienced the value of that care, and developed a desire to offer the same support to others.

Outside experience can be valuable, but it does not automatically transfer into LICW instruction. Operators who learned or taught through visual, mnemonic, speed-centered, accuracy-centered, or highly rigid methods may naturally return to those methods when teaching, especially when students struggle. That can create instructional drift even when the instructor's intentions are good.

Role Of Instructor Meetings And Continuing Alignment

LICW's bi-weekly instructor meetings provide a forum for discussing curriculum development, instructional practices, student needs, class operations, and emerging issues. All instructors are welcome to attend, and participation is encouraged as part of continuing instructional development.

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