Learning Morse Code as a Language

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The purpose of this document is to provide an overview of a unique method for teaching and learning Morse Code.   Learning Morse Code as a language is a teaching and self learning method developed by WØUCE that enables students to quickly hear and understand letters, words and phrases in Morse Code strictly by their unique sound and rhythm versus traditional methods that require memorizing or counting individual character components. This method is highly effective as students learn to immediately recognize and understand what is being sent in Morse simply by listening. There is no need to write or type anything as students learn to copy and understand Morse Code as a language. The method, tools and references listed herein are also applicable for those who have some degree of proficiency in using Morse Code but want to increase speed or overcome receiving or sending problems. As with all teaching methods, the degree of success in learning or improving Morse Code proficiency is totally dependent on the amount of dedication, perseverance and practice students put forth to reach their goals.

Children learn to understand and speak native language words during their first two years of life. During the second month of life infants start making random sounds then start to babble and by month four to five random sounds become real words, "mama" and "da da" are typically the first words infants speak. Between years one and two infants repeat and associate single words they hear them then quickly migrate to combining words into two to three-word sentences. Infants learn, retain and associate word meanings by sound, some may learn as many as ten or more words a day especially those who have parents that spend time teaching word sounds and associated meanings. The same is true regardless of which native language is spoken.

In similar fashion, simple single words are used when training dogs; "sit, stay, wait and outside" are typical of the first words dogs learn to understand by associating the sound of a complete word with an action or desired command. With word association training, there is no doubt dogs could learn the command "Sit" in Morse Code just as easily as the spoken word.

The WØUCE teaching method enables using Morse Code as a language from day one through the end of a training period which averages one to two months depending upon the amount of time devoted to learning. This method starts by learning to hear and recognize just three letters T, E & A then immediately progress to two letter groups, three letter groups, three letter words, short phrases then on to longer phrases and complete sentences. Students learn to hear, recognize, understand and retain what is being sent without need for paper or pencil to write anything down thus, they become conversant in Morse Code at a faster pace than any other teaching method. Students start at a 20 word per minute minimum speed which is quickly increased in small increments. Most students become proficient in receiving and sending Morse Code in the 25-30 wpm range in sixty-days or less. Individual success is based on several requirements:

- Students must have a sincere desire to learn and become proficient in receiving and sending Morse Code
- Students must dedicate themselves to 30 minute training sessions three or four days a week
- Students must commit to at least three ten minute homework practice periods a day, seven days a week
- Students will be encouraged to forget and ignore previous learning methods they may have tried

Learning Morse Code as a Language eliminates the agony of memorization, counting dits or dahs or frustrations associated with slower Morse Code teaching methods. Students learn on an interactive basis, just as infant learn to talk and immediately use Morse Code as a language which prevents and overcomes a number of common problems and frustrations associated with learning at slow speed, listen only methods.

Learning Morse as a language also improves proficiency for those with experience but may have problems to include:

Inability to distinguish spacing and timing	Increasing speed	Anticipating what is being sent
Dit and Dah Transposition	Counting Dits and Dahs	Memorization vs. hearing words
Mental fatigue	Lack of confidence	Inability to break old habits
Writing each letter as it is heard	Inability to copy behind	Attention loss, lack of accuracy

The letter teaching sequence used in this teaching method is based on the most common letters by frequency of use in English language:
- Sequence One: T, E, A,O,N,I,R,S
- Sequence Two: H,D,L,U,C
- Sequence Three: M,W,F,Y,P,G,B,V
- Sequence Four: K,J,X,Q,Z

English language letter combinations
Most frequently used first letters
T, A, S, O, I, C, W, P, B, F, H, M

Most frequently used last letters
E, T, S, D, N, R, Y, O, F, L, A, G

Double letters by frequency of use
ll, ee, ss, tt, oo, mm, ff, pp, rr ,nn, cc, dd

Most used two letter combinations by frequency of use
th, he, in, er, an, re, on, en, at, es, ed, te, ti, or, st, ar, nd, to, nt, is, of, it, al, as, ha, ng, co, se, me, de
Note: The thirty most frequent digraphs comprise one third of all letter usage

Digraph reversals by frequency of use
er-re, es-se, an-na, it-ti, on-no, en-ne, ot-to, ed-de, st-ts, at-ta, ar-ra, in-ni

Trigraphs by frequency of use
the, and, tio, ati, for, tha, ter, res, ere, con, ted, com, hat, ent, ion, nde, has, ing

Teaching Beginners	Elmering CW Operators with Experience
Character component sounds (T)	Determine problems, objectives and goals
Character component length (E)	Forget prior teaching methods
Character and word spacing (T E)	Character speed and spacing by individual
Unique letter sound (A)	Unique Letter Sounds
Unique letter rhythm (T E A)	Unique Double and Triple Letter Sounds
Unique letter combination sounds and rhythm T, E, A	Learning to listen to what is being sent
Unique word sound and rhythm Tea	Letter Number Combinations (Callsigns)
Minimum 20 wpm character speed	Copying words, phrases and sentences by ear
Minimum extra spacing between letters to start	Copying behind prevents anticipation
Copy only by listening	Note taking with pencil and paper
Copy entire word before speaking and sending	Using QSO and Contest Logging Programs
Progress to normal 3 x 1 x 7 spacing	Sending techniques: Hand Key, Bug, Keyer
Sending letter sequence One	QSO Conversation
Receiving letter sequence One	Chasing DX
Single Letters, Double Letters, Mixed three letter Grps	Contest exchanges
Three letter words, phrases, QSO Text, Note Taking	Overcoming Speed Bumps

Letter teaching sequence Segments One - Four, Numbers & Punctuation

SEGMENT ONE LETTERS: T E A O N I R S

LETTERS	TWO LETTER GROUPS	THREE LETTER GROUPS	THREE LETTER WORDS
E T A	TE AT EA	TTA TTE TAA AEE ATT ETA ETT	TEA ATE EAT TEE
O	OA OE OT EO TO EO AO OO	OTA OEO OTO OET OAE OTE	TOO TOE OAT ONE
N	NT NE NA NO ON AN TN NT	NEA NOE NTE NTA NOO NNO NIT	NAT NOT NET ONE TEN ANT EON NON
I	IT IA IE IN IO NI OI AI TI TE	TEI IAO NOI ION IAE ITO ITA TIO	TIN NAT NON EON
R	RE RT RA RO RN RI	RTE REO ORA RNT RTA RNE RIN	RAT RIO EAR ROT
S	ST SE SA SO SN SI SR SS RS ES SA	SRI SNS SIO STE SES SSE SRN SSO	SIN SET SAT SIR SON

SEGMENT TWO LETTERS: H D L U C

LETTERS	TWO LETTER GROUPS	THREE LETTER GROUPS	THREE LETTER WORDS
H	HA HO HN HI HR HS	HSR HRI HNO HTA HET	HAT HOT HEN HIT HAS HAD HER HIS HID
D	DE DA DO DN DI DR DS DH	DET DAO DNA DIR DST DHE DOA	DOT DIN DAN DID DUE DON DIT DOE DEN
L	LD LH LS LR LI LN LO LA LT LE	LAE LTE LON LRS LHD LLC LOE	LED LAD LET LOS LIT LID
U	UE UT UA UO UN UI UR US UH UD UL	ULD UHS URI UNL UOA UET UEI	URN USE DUE NUT SUN HUT
C	CU CL CD CH CS CR CI CN CO CE CT CA	CET CAO CNI CRS CHD CUL CCS	CAN CAD CUT COT COD CAT CUD

SEGMENT THREE LETTERS: M W F Y P G B V

LETTERS	TWO LETTER GROUPS	THREE LETTER GROUPS	THREE LETTER WORDS
M	MA MO MN MI MR MS MC MU ML MS	MCU MUL MDH MSR MIN MNO MEA	MAP MIT MOP MAN MAR MAT MET
W	WE WA WO WN WI WR WS WH	WEA WTE WNI WOR WRS WHU WCD	WIN WAR WET WON WED WAN WAD
F	FD FH FS FR FI FN FO FA FT FE	FWM FCU FLD FHS FRI FNO FTA FEM	FAT FOR FIN FUN FID FAR FEE FLY
Y	YE YT YA YO YN YI YR YS YH YD YL	YFW YMC YUL YDH YSR YIN YOT	YES YOR YEN YAP YIP YUP YUM YET
P	PU PL PD PH PS PR PI PN PO PE PT PA	PPY PFW PMC PUL PDH HSR PNI PAE	PIN PAN PET PAD PIT PUP PIC POP PIP
G	GI GE GA GO GR GU GF GY GP GG GT	GEA GAO GNI GRS GLU GIL GUO GOA	GUN GAD GET GOT GEM GAD GIN
B	BE BA BO BI BR BU BB BT	BTA BTE BON BIR BSD BLU BHC BGA	BET BAT BOP BIN BUS BIG BAG BOG
V	VE VA VI VU VO VE	VBG BPY VFP VWM BCU VLA VIN VUI	VET VAT VAN VUE VIE VFW VIA VEG

SEGMENT FOUR LETTERS: K J X Q Z

LETTERS	TWO LETTER GROUPS	THREE LETTER GROUPS	THREE LETTER WORDS
K	KV KB KG KP KY KF KW KM KC KU KE	KTA KON KIR KSH KDD KLU KCM KEI	KOI KIP KAF KEA KID KIF KOS
J	JK JV JB JG JP JY JF JW JM JC JU JL JD	JHS JRI JNO JAT JES JOK JUN JED JIS	JUT JAR JET JIB JAB JAG JOE JAW
X	XJ XK XV XB XG XP XY XF XW XM XE	XCU XLD XHS XRI XNO XAT XEX	AXE BOX HEX FAX NIX PIX SOX SAX
Q	QU QR QV QJ QK QB QG QP QY QF QL	QXJ QKV QBG QPY QFU QRS QSO QTR	QAT QIS QUA QUE QAT
Z	ZQ ZX ZJ ZK ZV ZB ZG ZP ZY ZF ZW ZM	ZCU ZLD ZHS ZRI ZNO ZAT ZEZ ZZI	ZOO ZAP ZIT ZIP ZAG ZIN ZIG BIZ WIZ

Numbers and punctuation teaching sequence

Ø	1	9	2	7	5	6	4	8	3	Period	Comma	Question Mark	Slash

Teaching and self learning steps

Using Morse Song MP-3 Files to teach, learn or overcome problems to use Morse Code as a language with Sequence One through Four Letters.

Morse Song
There is a direct relationship between music and Morse code thus Morse Song MP-3 files provide an enjoyable Morse Code second language learning experience set to music. The original Morse Code Song created by Andrew Crawford, VE1VAC, combines the unique sounds of all twenty-six letters of the English language with rhythmic cords which makes learning Morse simple and enjoyable.

Morse Song Letter Sequence Groups
VE1VAC's original Morse Song has been digitally rearranged and converted to four MP-3 teaching aids and self learning tools. The MP-3 files are arranged to play letters in sequence as they most frequently appear in English language words. Morse Song Groups are useful tools for learning to copy, send and also to overcome letter confusion and related learning problems. Morse Song MP-3 Files are available for download at: http://www.cwops.org/cwa-student-res.html

Self learning and interactive teaching
It makes no sense to learn Morse Code at slow speed then go through the drudgery of having to learn to increase speed. Beginners should first learn to send with a hand key before progressing to a bug or electronic keyer. Morse Song Sequences are an excellent tool to help develop a smooth, rhythmic sending fist by simply listening then sending along with MP-3 sequence files as they are played.

Beginners will need a hand key and code practice oscillator or transceiver sidetone can be keyed. As an alternative, Morse Translator, an online application at: http://morsecode.scphillips.com/jtranslator.html can be used by simply entering letters, two, three letter groups and three letter words then click "Play." Instructors and students are encouraged to set the Speed and Farnsworth Speed selections at 20 words per minute to start then gradually increase character speed and reduce spacing between letters, groups, words and phrases as student proficiency improves.

Morse Song and Letter Sequence as teaching resources for instructors
Every Morse Code instructor has a personal preference for teaching or mentoring others to help overcome problems. Morse Song and use of the Letters, Groups and Words in the WØUCE method as well as Morse Song MP-3 files can be incorporated and personalized to complement other methods.

OOVOO Audio / Video Conferencing
OOVOO is a free high-quality Internet based audio/video chat and conferencing application that has proven to be an effective teaching tool for instructors and students. OOVOO provides a live face-to-face teaching and learning environment for one-on-one sessions or up to six people in a virtual classroom. OOVOO is available for PC, Mac, Android based Tablets and Smartphones. If a computer does not have an internal webcam, an inexpensive USB webcam will provide suitable audio video capability.

Instructors can send Morse over-the-air and students can reply over-the-air or by OOVOO. Sending Morse over the audio portion of OOVOO provides adequate quality when code practice oscillators and radio side-tone is used. The application also provides an excellent media for individuals to practice with others if propagation or conditions do not permit on-the-air sessions or if someone does not have HF capabilities.

When teaching beginners, OOVOO and Morse Song can be combined by simply using Media Player or another MP-3 device to play Segment One, Two, Three and Four Morse Song MP-3 files over the audio link.

Real-time audio/video conferencing offers a tremendous advantage for instructors because students can be monitored both visually and audibly. Student facial expressions and body language often reveals issues or problems that can be immediately addressed by the instructor. OOVOO, Morse Song and Morse Translator also enables instructors to teach or mentor students anywhere in the world over the Internet when propagation precludes establishing or maintaining on-the-air Morse training sessions. OOVOO is available for download: http://www.oovoo.com/home.aspx

The following items are required in order to participate in a CWops Academy Internet Training Course
1. Reliable broadband Internet service
2. OOVOO Video Chat Application
3. Webcam
4. Hand Key, Bug or Paddles for use with electronic keyer
5. Code Practice Oscillator or ability to key transceiver sidetone

Online training classes are typically conducted three to four times per week, students are also given homework assignments and are required to practice a minimum of 30 minutes per day. Students are also encouraged to get on the air and also conduct OOVOO QSOs and interactive homework assignment practice sessions.

Cut Numbers Used in Morse Code										
Full Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Ø**
Cut Numbers (Note 4)	**A**	**U**	**W**	**V**	**S**	**B**	**G**	**D**	**N**	**T**
Cut Numbers common in Ham Radio										
Commonly used in Rag Chew QSOs (Note 1)									N	
Commonly used in DX QSOs (Note 2)									N	T
Commonly used in Contests (Note 3)	A				E				N	T
Note 1 **RST 5NN**									N	
Note 2: **RST 5NN -** Especially by Dxpeditions									N	
Note 3: **RST & Serial Numbers**	A				E				N	T
Note 4: Seldom used in Ham Radio QSOs		U	W	V	S	B	B	D		

Commonly Used Q Signals and Meaning
QRL Is the frequency busy? The frequency is busy. Please do not interfere.
QRM Interference from other signals.
QRN Interference from natural or man-made static.
QRO Shall I increase power? Increase power.
QRP Shall I decrease power? Decrease power.
QRQ Shall I send faster? Send faster (WPM).
QRS Shall I send more slowly? Send more slowly (__WPM).
QRT Shall I stop sending? Stop sending.
QRU Have you anything more for me? I have nothing more for you.
QRV Are you ready? I am ready.
QRX Standby.
QRZ Who is calling me?
QSB Abbreviation for signal fading.
QSL Received and understood.
QSO Communications between two or more participants.
QST General call preceding a message addressed to all amateurs.
QSX I am listening on ___ kHz.
QSY Change to transmission on another frequency (or to ___ kHz).
QTH What is your location? My location is ____.
QTR The correct time is. What is the correct time?

Abbreviations & Prosigns

8 Es	Error		**GA**	Go Ahead		**SASE**	Self Addressed Stamped Envelope
73	Best Wishes		**GA**	Good Afternoon		**SIG**	Signal
88	Love and Kisses		**GE**	Good Evening		**SKED**	Schedule
AA	All After		**GM**	Good Morning		**SRI**	Sorry
AB	All Before		**GND**	Ground		**SSB**	Single Side Band
ABT	About		**HI**	Laughter		**STN**	Station
ADR	Address		**HR**	Here		**SVC**	Service
AGN	Again		**HW**	How		**TFC**	Traffic
ANT	Antenna		**K**	Invitation to transmit		**TKS**	Thanks
AR	End of Transmission		**KN**	Invitation to transmit specific call		**TMW**	Tomorrow
AR N	No more to follow		**LID**	Poor Operator		**TKS**	Thanks
AS	Wait		**MSG**	Message		**TNX**	Thanks (Short for Thank You)
B4	Before		**N**	No more to follow		**TU**	Thank You
BK	Break		**NIL**	No More		**TX**	Transmitter
BUG	Semi Automatic Speed Key		**NW**	Now		**TXT**	Test
C	Yes		**OM**	Old Man		**UR**	Your
CFM	Confirm		**OP**	Operator		**VY**	Very
CK	Check		**OT**	Old Timer		**WA**	Word After
CL	Clear		**PBL**	Preamble		**WB**	Word Before
CLD	Cleared		**PDL**	Paddle		**WDS**	Words
CLG	Calling		**PSE**	Please		**WKD**	Worked
CQ	CQ - Calling any station		**PWR**	Power		**WUD**	Would
DLVD	Delivered		**R**	Roger "Received OK'		**XCVR**	Transceiver
DR	Dear		**RCVD**	Received		**XMTR**	Transmitter
DX	Foreign Station		**RCVR**	Receiver		**XYL**	Wife
ES	And		**RIG**	Radio Station Equipment		**YL**	Young Lady
FB	Fine Business		**RX**	Receive			

Teaching and self practice resources and tools:

- **CW Operators' Club** *(CWops)* **Academy**: http://www.cwops.org/cwacademy.html

- **CWops Academy Student and Advisor Resources:** http://www.cwops.org/cwacademy2.html

- **AA9PW Morse Code Practice and Online Exam Tool**: http://aa9pw.com/morsecode/

- **RUFZ Call Sign Pile Up Trainer**: Excellent practice tool for Letter/Number combinations and call signs: http://www.rufzxp.net/

- **Morse Runner:** Self teaching and practice tool - Excellent practice for homework assignments: http://www.dxatlas.com/MorseRunner/

- **Morse Translator:** Online Java application for translating text to Morse code: http://morsecode.scphillips.com/jtranslator.html

- **OOVOO**: Free Internet Audio Visual Conferencing application: http://www.oovoo.com/home.aspx

- Zen and the Art of Radio Telegraphy. http://www.qsl.net/ik0ygj/enu/ZART_r20101008m.pdf