ANALYSES OF OTHER CHARACTER SEQUENCES:

Keller and Taubman (1943) provides us with The Rank Order of Difficulty for 36 Morse Code Characters (including numbers). We will use this rank in comparing and analyzing various sequences of character introduction.

P W J F Y G Q L Z 3 U B 2 C D X 6 K 1 R 7 4 8 H 9 5 V S N O M A I T 0 E

P/36 W/35 J/34 F/33 Y/32 G/31 Q/30 L/29 Z/28 3/27 U/26 B/25 2/24 C/23 D/22 X/21 6/20 K/19 1/18 R/17 7/16 4/15 8/14 H/13 9/12 5/11 V/10 S/9 N/8 O/7 M/6 A/5 I/4 T/3 0/2 E/1

COMPARISON OF OTHER TRAINING ORGANIZATIONS:

KOCH 1936
L F C K R D P X Y Q B G A N Z U V W J H S I E O M T
29 33 23 19 17 22 36 21 32 30 25 31 5 8 28 26 10 35 34 13 9 4 1 7 6 3
(121) First 5   (21) Last 5

The sequence is weighted heavily to the front with difficult letters. It has a very high rank (121) of first 5 characters. That would seem inconsistent with Koch's recommendation that difficult characters should be introduced in or after the first third of the training, but the inconsistency is likely the difference between German and English. The rank order of difficulty for the end of the sequence is strikingly easy.

G4FON (LICW, FISTS EU)
K M R S U A P T L O W I . N J E F 0 Y , V G 5 / Q 9 Z H 3 8 B ? 4 2 7 C 1 D 6 X
19 6 17 9 26 5 36 3 29 7 35 4 8 34 1 33 2 32 10 31 11 30 12 12 28 13 27 25 15 24 16 23 18 22 20 21 Ranking order of difficulty
(77) First 5   (104) Last 5

LCWO
K M U R E S N A P T L W I . J Z = F O Y , V G 5 / Q 9 2 H 3 8 B ? 4 7 C 1 D 6 0 X
19 6 26 17 1 9 8 5 36 3 29 35 4 34 28 33 2 32 10 31 11 30 12 24 13 27 14 25 15 16 23 18 22 2 21
(69) First 5   (86) Last 5

The G4FON group have a high rank of the first 5 characters and an even higher rank of the last 5. Certain characters are not well-differentiated sound patterns (e.g., SU and 42) which helps explain why LCWO deviated from the G4FON order. The G4FON order is not similar to Koch 1936.

ARRL MORSE CODE THE ESSENTIAL LANGUAGE
E T A R . N D K C X Y I S H V J B W L P U F ? M O G Z Q , 1 2 3 4 5 6 7 8 9 0 ERROR " ; / - : <KN> <AS> <BT> <AR> <SK> <SN> <KA>
1 3 5 17 8 22 19 23 21 32 4 9 13 10 34 25 35 29 36 26 33 6 7 31 28 30 18 24 27 15 11 20 16 14 12 7
(34) First 5   (69) Last 5

ARRL MORSE CODE THE ESSENTIAL LANGUAGE - ALTERNATIVE
T R N E A I O S D H C U Y . L M P G F W B J , / K Q X V Z ? 1 2 3 4 5 6 7 8 9 0 " ; - : <KN> <AS> <BT> <AR> <SK> <SN> <KA>
3 17 8 1 5 4 7 9 22 13 23 26 32 29 6 36 31 33 35 25 34 19 30 21 10 28 18 24 27 15 11 20 16 14 12 7
(34) First 5   (69) Last 5

SKCC (US Army/Navy Morse Training Manual)
E I S T M O A N W B C D G Q X Y Z F H J K L P R U V 1 2 3 4 5 6 7 8 9 0 / ? , . K <KN> <AR> <BT> <SK> QTH QRM QRN QSL QSY QRS QRQ QSK
1 4 9 3 6 7 5 8 35 25 23 22 31 30 21 32 28 33 13 34 19 29 36 17 26 10 18 24 27 15 11 20 16 14 12 7
(23) First 5   (69) Last 5

EACW (EA4CQK)
T M O E I S H A U V N D B P R L G J W Q Z Y X K C G F 1 2 3 4 5 6 7 8 9 0 PROSIGNS
3 6 7 1 4 9 13 5 26 10 8 22 25 36 17 29 31 34 35 30 28 32 21 19 23 31 33 18 24 27 15 11 20 16 14 12 7
(21) First 5   (69) Last 5

US Navy Morse Operator Manual 1967 Vietnam Era
E T A N I S H M O U V D B K C W J P R L F G Z X Y Q 1 2 3 4 5 6 7 8 9 0
1 3 5 8 4 9 13 6 7 26 10 22 25 19 23 35 36 17 29 33 31 28 21 32 30 18 24 27 15 11 20 16 14 12 7
(21) First 5   (69) Last 5

Ritter WØUCE
T E A O U N D R S C W P H L B K I V Q Y M Z X F J G
3 1 5 7 26 8 22 17 9 23 35 36 13 29 25 19 4 10 30 32 6 28 21 33 34 31 Ranking order of difficulty
(42) First 5   (147) Last 5

Training Organization A
A E N T I O S 1 4 D H L R 2 5 C U M W 3 6 ? F Y G P 7 9 / B V J K 0 8 <BT> Q X Z <BK> - <SK>
5 1 8 3 4 7 9 18 15 22 13 29 17 24 11 23 26 6 35 27 20 33 32 31 36 16 12 25 10 34 19 2 14 30 21 28
(21) First 5   (95) Last 5

There are many similarities with the sequences in this group and it is hard to find fault with any of them. Each starts with relatively easy characters and introduces the more difficult ones in accordance with the Koch guidance. The biggest differentiator is where numbers are introduced. Koch did not use numbers in his 1936 experiments. Most of the sequences above introduce numbers at the end.

According to Morsh & Stannard (1947) "The indiscriminate mixing of numerals and letters in the runs was thought to be unnecessary. It introduced a complicating factor into the initial training, since the student had to differentiate between thirty-six sound patterns, a harder task than distinguishing between patterns in two series of twenty-six and ten respectively. In the revised Code-Voice Method the letters and numbers are taught separately. This permits of a more thorough learning of knowledge the army operator will later require."

There may be merit in doing so but LICW has not done it that way. The sequence from Training Organization A has the numbers well integrated into the sequence and does the best job of introducing characters with well-differentiated sound patterns.