Proposal to add Southern Song forms of counting rods as separate characters

Eduardo Marin Silva

08/06/2017

I propose the addition of five new counting rods characters for the Southern Song dynasty.

Introduction. The committee ruled in my previous proposal: http://www.unicode.org/L2/L2017/17085-counting-rod-std-var-seq.pdf that the proposed variation sequences were too different from the proposed base to be considered as variations. I now understand better such rationale and therefore I submit a different proposal to encode them as separate characters along with the relevant evidence. For more information about the Southern Song forms and why its encoding is important, please refer to my previous proposal.

Evidence. Last time I submitted examples, but none of them referred to an original source, so I now submit examples from: *Mathematical Treatise in Nine Sections* (数书九章) which was written on the relevant time by mathematician Qin Jiushao.
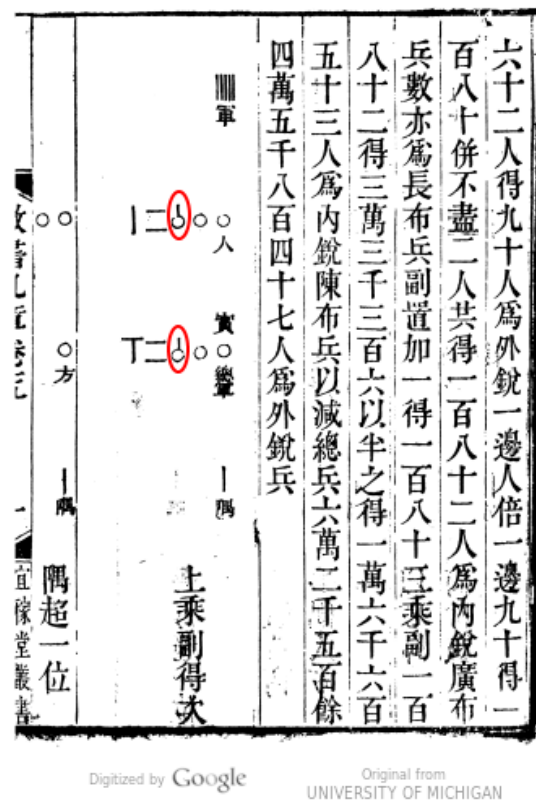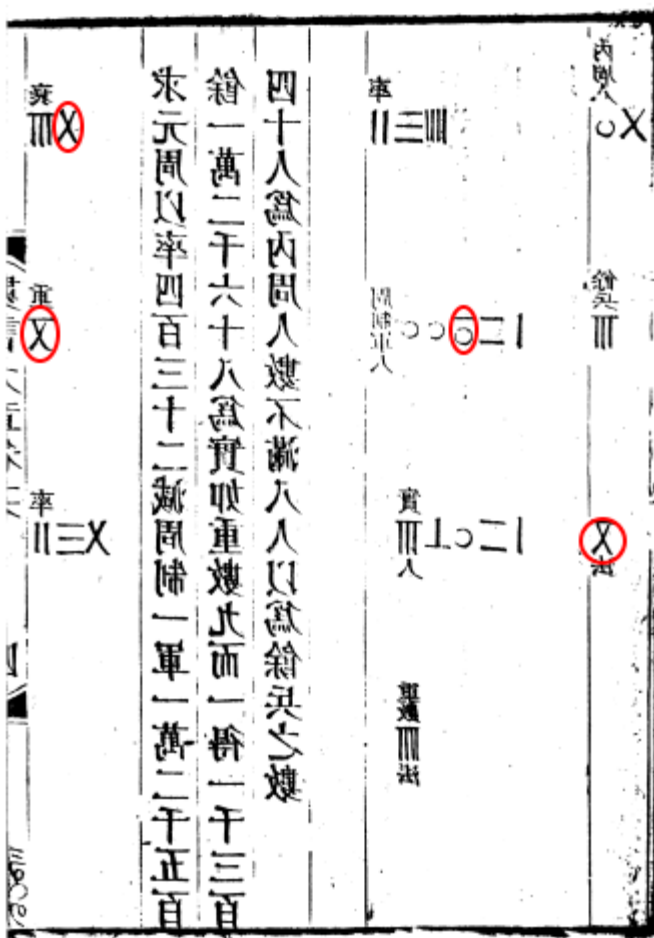
Note on the glyphs. The glyphs in the font are somewhat different than the ones present in the manuscript, that's because we want to keep the harmony with the other already encoded counting rods. That means having the same overall width and stroke width, as well as having a circumference that matches the Unicode IDEOGRAPHIC NUMBER ZERO, because if one looks at the manuscript the unit digit five and the tens digit five are in fact the ideographic zero with an extra stroke. The only inconvenience is that the extra stroke in the unit digit five is too small since the ideographic zero already occupies so much space, and therefore the two of them can become confused. Nothing a proper font design cannot solve, simply reduce the size of the zero along with the aforementioned characters and you can have a longer vertical stroke, like in the manuscript.

Entries.

Southern song counting rods

1D379 ╳ COUNTING ROD SOUTHERN SONG DIGIT FOUR

- Used for both units and tens

→ 3024 ╳ HANGZHOU NUMERAL FOUR

1D37A ○ COUNTING ROD SOUTHERN SONG UNIT DIGIT FIVE

→ 3025 〦 HANGZHOU NUMERAL FIVE

1D37B ✕ COUNTING ROD SOUTHERN SONG UNIT DIGIT NINE

→ 3029 〩 HANGZHOU NUMERAL NINE

1D37C ⊙̄ COUNTING ROD SOUTHERN SONG TENS DIGIT FIVE

1D37D ✕̄ COUNTING ROD SOUTHERN SONG TENS DIGIT NINE

Properties.

- 1D379;COUNTING ROD SOUTHERN SONG DIGIT FOUR;No;0;L;;;;4;N;;;;;
- 1D37A;COUNTING ROD SOUTHERN SONG UNIT DIGIT FIVE;No;0;L;;;;5;N;;;;;
- 1D37B;COUNTING ROD SOUTHERN SONG UNIT DIGIT NINE;No;0;L;;;;9;N;;;;;
- 1D37C;COUNTING ROD SOUTHERN SONG TENS DIGIT FIVE;No;0;L;;;;50;N;;;;;
- 1D37D;COUNTING ROD SOUTHERN SONG TENS DIGIT NINE;No;0;L;;;;90;N;;;;;

Note on the digit four. The unit digits can take the value of both 5 and 9 and similarly the tens digits of them can take the value of 50 and 90 respectively. For the digit four, units and tens digits are unified, because otherwise it would be really confusable, so I propose to just assign it the value 4 and let implementers deal with the edge cases.

Similar characters. Unlike the appearance of Senzhou numeral four which is more in line with regular handwriting in East Asia, the counting Rod form is a perfect X of 45 degree angles made of straight lines, so they could not be called confusable (a similar argument follows from U+2717 BALLOT X and U+2613 SALTIRE) it is also bigger than the multiplication sign, and the vector or cross product characters. Some characters that might be confusable would be U+2715 MULTIPLICATION X and U+2A09 N-ARY TIMES OPERATOR, but unlike any of those characters that are either an operator or a symbol, U+1D379 is a numeral with a corresponding value.

It is tempting to say that apart from the number 4 the other characters should be obtained with sequences, but this is not the direction we should go in, normally numerals are not required to be composed with combining characters, such as COMBINING VERTICAL LINE ABOVE or COMBINING MACRON which should be reserved for letters. This proposal overall is great for whoever wants to transcribe Southern Song dynasty documents and completes the holes in the notation.

Thanks. I would like to thank Ken Lunde who provided the font as well as invaluable feedback on the document.

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1].
Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html **.**
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Proposal to add Southern Song forms of counting rods as separate characters*
2. Requester's name: *Eduardo Marin Silva*
3. Requester type (Member body/Liaison/Individual contribution): *Individual Contribution*
4. Submission date: *08/06/2017*
5. Requester's reference (if applicable):
6. Choose one of the following:
   - This is a complete proposal: *Complete*
   - (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   - a. This proposal is for a new script (set of characters): *N/A*
     - Proposed name of script:
   - b. The proposal is for addition of character(s) to an existing block: *Yes*
     - Name of the existing block: *Counting Rods*
2. Number of characters in proposal: *5*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary ☐   B.1-Specialized (small collection) ☐   ✓ B.2-Specialized (large collection) ☐
   C-Major extinct ☐   D-Attested extinct ☐   E-Minor extinct ☐
   F-Archaic Hieroglyphic or Ideographic ☐   G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? *Yes*
   - a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? *Yes*
   - b. Are the character shapes attached in a legible form suitable for review? *Yes*
5. Fonts related:
   - a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
     Ken Lunde
   - b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
     lunde@adobe.com
6. References:
   - a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
   - b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *Yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?
   There is a minor issue with the presentation of the unit digit five, because we are following a stylistic observation that it should conform with the size of the Ideographic zero, and the current Unicode zero is bigger than in the manuscript so the extra stroke is barely visible.

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?	*Yes*
If YES explain *This is a revised version*	
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)?	*No*
If YES, with whom?	
If YES, available relevant documents:	
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?	*n/a*
Reference:	
4. The context of use for the proposed characters (type of use; common or rare)	*Their prevalence with respect to other counting rods is unknown*
Reference:	
5. Are the proposed characters in current use by the user community?	Unknown
If YES, where? Reference:	
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?	*No*
If YES, is a rationale provided?	
If YES, reference:	
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	Yes
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?	*No*
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?	*No*
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character?	*Yes*
If YES, is a rationale for its inclusion provided?	*Yes*
If YES, reference: *This document: similar characters*	
11. Does the proposal include use of combining characters and/or use of composite sequences?	*No*
If YES, is a rationale for such use provided?	
If YES, reference:	
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?	
If YES, reference:	
12. Does the proposal contain characters with any special properties such as control function or similar semantics?	*No*
If YES, describe in detail (include attachment if necessary)	
13. Does the proposal contain any Ideographic compatibility characters?	*No*
If YES, are the equivalent corresponding unified ideographic characters identified?	
If YES, reference:	