

**TO: Unicode Technical Committee**  
**FROM: Naga Ganesan**  
**SUBJECT: ZWJ for Grantha pre-pausal half-consonants (chillus)**  
**DATE: 14 October 2014**

This is a short summary of the presentation I made at the last UTC meeting seeking ZWJ (U+200D) for representing Grantha pre-pausal half-consonants (Chillus).

(1) This request basically follows what is outlined in Peter Constable's document on ZWJ joiner use for many of Indian scripts. <http://www.unicode.org/review/pr-37.pdf> as applied to Grantha. For example, in Devanagari script, [ka क] [virāma ँ] [ZWJ] [ṣa ष] कष

(2) There are about 30 pre-pausal half-consonants in Grantha, and they can occur in word-medial positions to indicate pauses and also at the end of words. The employment of these half-consonants is the choice of the User. There are 3 presentation forms that differ visually substantially in words in Grantha script. Figure 1 (page 2) shows all the three displays in a word: <http://www.unicode.org/L2/L2014/14097-grantha-chillu-zwj.pdf>

(3) In Peter's PRI-37 review document, "More generally, the following is proposed for a complete specification of the functions of ZWJ and ZWNJ in relation to consonant sequences in Indic scripts. Conjoining of consonants in Indic scripts follows a three-level precedence hierarchy: a dead consonant Cd followed by a consonant C2 can be displayed in three ways:

1. The combination of Cd and C2 can form a conjunct ligature
2. Either Cd or C2 takes on an alternate conjoining form and is combined with the full form of the other consonant
3. Cd is displayed with an overt *halant*, followed by the full form of C2"

Following this Indic model, Grantha words 3 levels are proposed to be encoded. The vertical stacks of consonants is Level 1 and no Joiners for Level 1. ZWJ joiner is for pre-pausal half-consonants and this is Level 2. As in all Indic scripts, Level 3 is Explicit visible virama wherever needed by the User.

(4) Grantha, half-consonants (*chillus*) can occur in word-medial positions to indicate pauses and also at the end of words. The employment of these half-consonants is the choice of the user. There are 3 presentation forms that differ visually substantially in words in Grantha script. Figure 1 (page 2) shows these three displays in a word in Grantha,

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(5) There is also a reason the school teachers advise about the need to use two different Joiners (ZWJ & ZWNJ) for Level 2 and Level 3 in Grantha script. This archaic script, in the preliminary stages of classes can be taught in "Linear" format. i.e., without vertical stacks and displaying Explicit Virama (using ZWNJ) in Level 3, and half-consonants need to be

shown as Level 2 (using ZWJ). If both joiners are used, it is easy for the User to go to Vertical Stack format from Linear Format of the text. The two levels using two joiners will avoid confusion greatly in plain-text.

(6) L2/14-164 gives an example page where both Explicit Virama consonants and Half-consonants (*chillus*) occur in the same paragraph (1923 book). In plain-text, these display forms can be differentiated using Level-2 (ZWJ) and Level-3(ZWNJ) joiners. Grantha is in SMP block, and Grantha fonts in BMP make use of the similar approach in Malayalam block.

(7) Sriramana Sharma's suggestion of using only Level-3 (ZWNJ), but changing fonts whenever a *chillu* is needed is highly problematic. As Peter Constable pointed out at the UTC meeting, it will be also not following what is done for other closely related India's scripts to deal with the 3 levels of vowel-less consonants. Sharma's L2/14-110 goes to his L2/14-002 which uses ZWNJ only for both Chillu-s and Explicit Virama forms in representation of Level-2 and Level-3 forms. Please read my comments describing the practical problems if we have to use this solution. My comments are in Sections 2 & 3 in L2/14-162

<http://www.unicode.org/L2/L2014/14162-grantha-zwj.pdf>

From page 1, L2/14-002, Sharma's use of ZWNJ to represent Old style (Extinct) NA vs. the standard NA (Modern style). This Rich-text solution is cumbersome and involves change of fonts in Grantha as there is no Old style vs. New style fonts. Sharma's solution gets rid of Level-2 representation using ZWJ which will lead to confusion and difficulties for the Users.