



Japan DAISY Consortium  
JDC101, 1-1-61 Wakaba-cho, Chofu-shi,  
Tokyo 182-0003, Japan  
TEL: +81-3-5384-7207 FAX: +81-3-5384-7207

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## **Open Letter to Browser Vendors, W3C, and WHATWG: Towards Accessible Ruby**

Dear Browser Vendors, W3C, and WHATWG,

The Japan DAISY Consortium has promoted DAISY textbooks for those Japanese students who have print disabilities. We have been providing organizational and technical support to those who produce DAISY textbooks in Japan. We are thus practical rather than theoretical or political.

The historical purpose of introducing ruby to Japanese typesetting practice was probably to help those who could not read difficult CJK ideographic characters. Ruby indeed helps such people. However, we have observed that ruby also hampers accessibility. First, existing text-to-speech implementations do not work well for documents containing ruby. Second, the typical rendering of ruby is hard to read for low-vision and dyslexic people.

Making ruby accessible is a challenge. It is necessary to improve browser implementations, and it is also necessary to improve HTML documents and CSS style sheets.

We believe that CSS of W3C will play a critical role in making ruby accessible. We also believe that some features of W3C HTML Ruby not present in WHATWG HTML are crucial for making ruby accessible. The Japan DAISY Consortium cordially requests

browser vendors, W3C, and WHATWG to study accessibility problems around ruby. These problems have been sadly overlooked, as we see them.

We hope that this letter will raise awareness on the accessibility issues with ruby, and that in the near future relevant stakeholders can coordinate and take up the necessary technical work, both on specifications and more importantly on implementations, to improve the accessibility of Japanese on the Web.

## **Current status of ruby accessibility**

### **1) T2S**

As of 2021, T2S does not work well for documents containing ruby. We created [a wiki page documenting this problem](#) and hope to create a W3C Note from it.

That page is restricted to user requirements and thus does not consider possible enhancements to current implementations. Here we would like to point out that the generation of accessibility trees requires special treatment of ruby. Simply stripping tags representing ruby while keeping text leads to double reading of base and ruby, which is very annoying and, in the worst case, completely misleading.

Ideally, each base-ruby pair should be clearly represented in the accessibility tree or DOM tree. It then becomes easier to use both the base and ruby to choose the most appropriate phonetics. There should also be some way for authors to indicate if the ruby is used for phonetic annotations (in which case reading both is inappropriate), or as supplemental information (in which case both should be read), as heuristics cannot reliably determine that.

### **2) Dyslexia**

Some dyslexic people cannot separate base characters and ruby. Thus, a base character with associated ruby looks like an unknown character having a strange radical to them.

To overcome this problem, it is important to widen the gap between base characters and ruby. But this is not possible in most browsers except Firefox. The use of a different color for ruby is also helpful and is fortunately supported by most browsers.

### 3) Low vision

Ruby is much smaller than normal text. Ruby is thus difficult for low-vision people to read.

In printed materials, it is quite common to avoid smaller characters (e.g., っ U+3063) and use similar-but-larger characters (e.g., っ U+3064) instead. However making this kind of substitution changes the phonetics of the word, because these smaller and larger characters, while visually similar, are in fact distinct letters. But IT technology allows other possibilities. By converting smaller characters to larger characters at rendering rather than in the document source (see the `text-transform` property of CSS, currently only supported in Firefox), we can make ruby easier for low-vision people to read without hampering T2S.

It is also possible to change the font size of ruby depending on user preferences. Prof. Nakano of Keio University reported that low-vision students prefer ruby long in height.

### 4) Textual fallback

Although visual rendering of ruby is expected to put the ruby in parallel to the base, the textual or linear fallback of ruby is often required. Such fallback is used for metadata, user interface components (see [an EPUB issue](#)), and so forth. When mono ruby is attached to a sequence of base characters, it is unfortunately too common to see ruby after each base character (e.g., 東とう京きょう), rather than combined after the compound word (e.g., 東京とうきょう). Such awkward results are a natural consequence of the inappropriate structure of WHATWG ruby markup (e.g., `<ruby>東<rt>とう</rt>京<rt>きょう</rt></ruby>`), a problem W3C ruby markup extensions address.

### 5) Switching of rendering style

Given Japanese text having CJK ideographic characters, one can choose to present ruby-annotated text in many ways: showing or hiding some or all annotations; inlining them in addition to, or in place of, the base text; and varying their typesetting style (mono vs jukugo) and spacing. Different presentations can be appropriate for different reading levels, reading preferences, and disabilities.

Unlike printed materials, IT technology, in theory, allows on-the-fly switching between rendering styles, but such switching is not practically realized.

## 6) Conversion to braille

When assistive technology converts HTML or EPUB to Japanese braille, just as in the text-to-speech situation, it would be helpful if each base-ruby pair is clearly represented in the accessibility tree or DOM tree. It then becomes easier to use both the base and ruby for choosing the most appropriate braille.

Sincerely,

Hiroshi Kawamura

Chairman of the Steering Committee of the Japan DAISY Consortium  
Vice President, Assistive Technology Development Organization (ATDO)

Board Member of the DAISY Consortium (one of the founders)

Member of the WAI/W3C Steering Council

Standing Committee Member of IFLA/LPD Section

Member of the Committee on Services for Persons with Disabilities, Japan Library Association

Global Chair of the ICTA/Rehabilitation International

