

SMPTE ENGINEERING GUIDELINE

D-Cinema Distribution Master — SMPTE

Mastering Guideline for Japanese Timed Text

Approved - 2026-04-28

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Foreword

The Society of Motion Picture and Television Engineers (SMPTE) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU. SMPTE Engineering Documents are drafted in accordance with the rules given in its Standards Operations Manual.

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At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Engineering Document. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

This document was prepared by Technology Committee 27C.

Introduction

This clause is entirely informative and does not form an integral part of this Engineering Document.

The 27C Stereo Subtitling drafting group has found that some subtitle rendering devices, deployed in the field, conform to older revisions of [SMPTE ST 428-7](#), but not to the [SMPTE ST 428-7: 2014](#) version (latest version as of the date of publication of this EG). Others have different interpretations of ambiguous portions of the specification. This variance in behavior can cause subtitle characters to be displayed in theaters differently than what was intended during mastering. This has sometimes delayed the adoption of SMPTE-compliant D-Cinema Packages (DCPs), as has happened in Japan.

This mastering engineering guideline presents some common Japanese use cases with XML examples and intended rendered appearance to minimize the differences among products and various [SMPTE ST 428-7](#) implementations, and to allow broader adoption of SMPTE-compliant DCPs and their continued usage with confidence.

1 Scope

This engineering guideline provides several XML examples of common Japanese use cases, along with their expected appearance and mastering recommendations to respect as best as possible the intent of the content creator.

2 Conformance

This Engineering Guideline is purely informative and meant to provide tutorial information to the industry. It does not impose Conformance Requirements and avoids the use of Conformance Notation.

Engineering Guidelines frequently provide tutorial information about a Standard or Recommended Practice and when this is the case, the user should rely on the Standards and Recommended Practices referenced for interoperability information.

3 Normative references

There are no normative references in this document.

4 Terms and definitions

For the purposes of this document, the terms and definitions given in the following documents and the additional terms and definitions apply:

- [SMPTE ST 428-7](#)

4.1

projection mask

edge of active area of the picture essence, where the active area is the rectangular region which is intended to be visible to the audience

Note 1 to entry: Active area information is available through the `MainPictureActiveArea` element as defined in [SMPTE ST 429-16](#).

5 Samples of Japanese text and characters

5.1 Vertical text

Vertical text corresponds to text that is vertically rendered, as shown in [Figure 1](#), and specified using a `Direction` attribute value of `ttb` or `btt` as defined in [SMPTE ST 428-7](#). The vertical text is used when the subtitle cannot be placed at the bottom of the primary picture as horizontal text due to possible overlap with the other on-screen text, or because of director/translator intent.

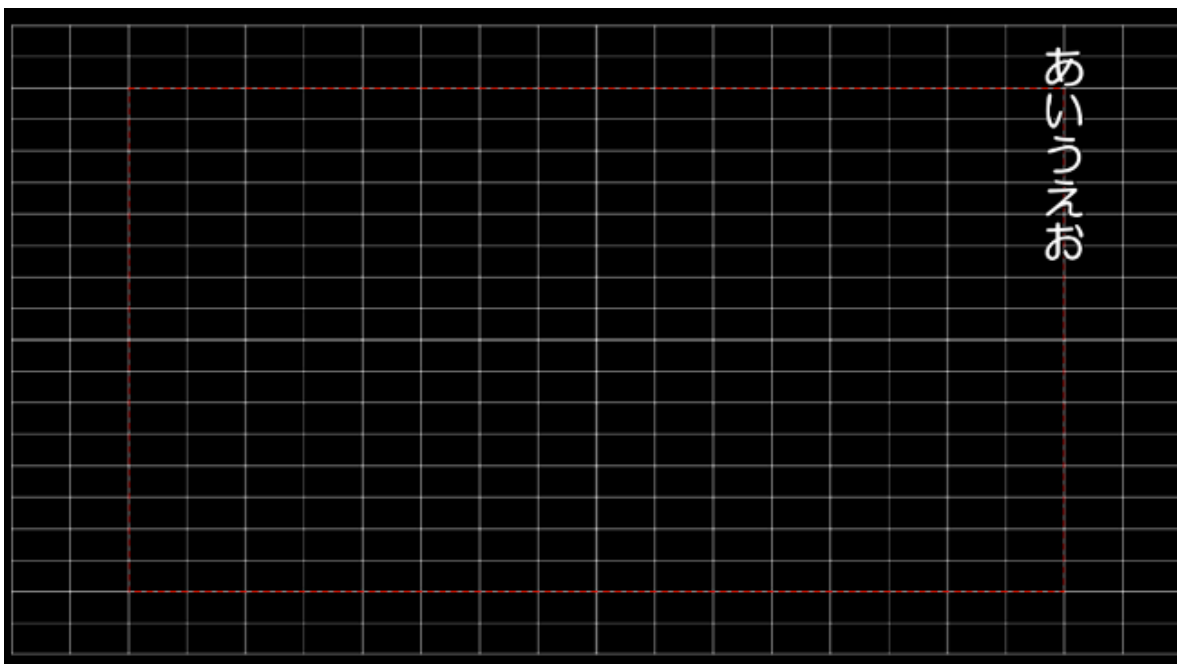


Figure 1 — Vertical text sample

5.2 TateChuYoko

In vertical text, the TateChuYoko places numbers side-by-side instead of vertical stacking for easier reading, as shown in [Figure 2](#). In general, it uses up to four digits.

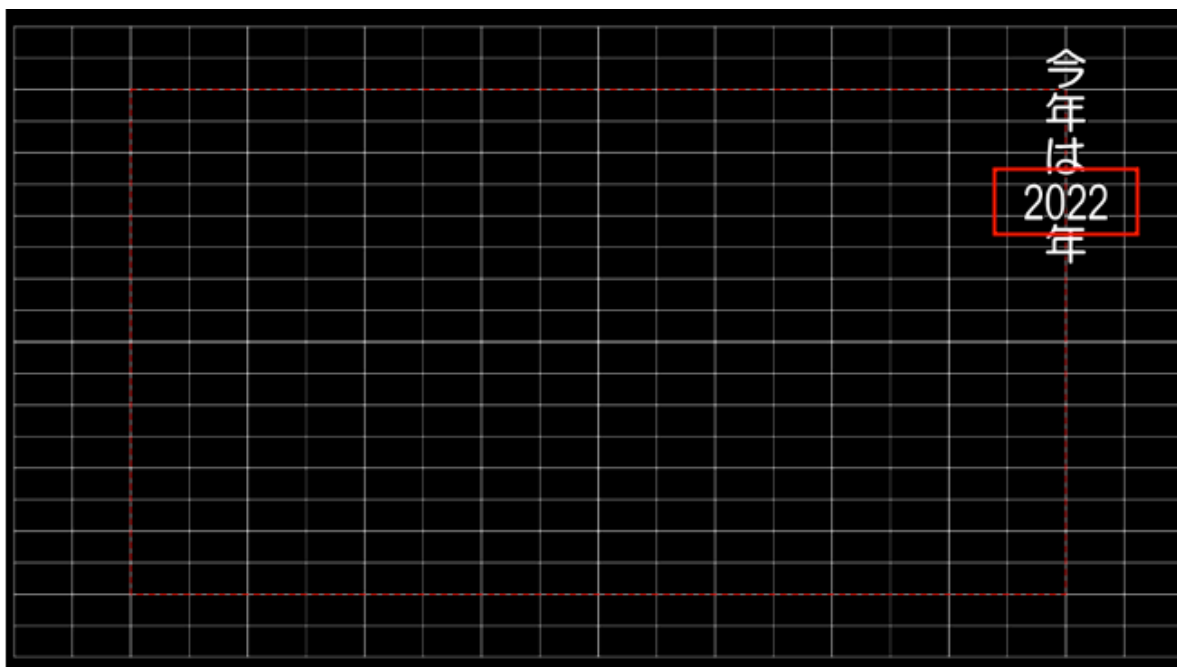


Figure 2 — TateChuYoko sample

5.3 Chidori-style

The Chidori-style is used for song lyrics. It shifts the beginning of the first and second lines by placing space characters at the end of the first line and space characters at the beginning of the second line, as shown in [Figure 3](#).

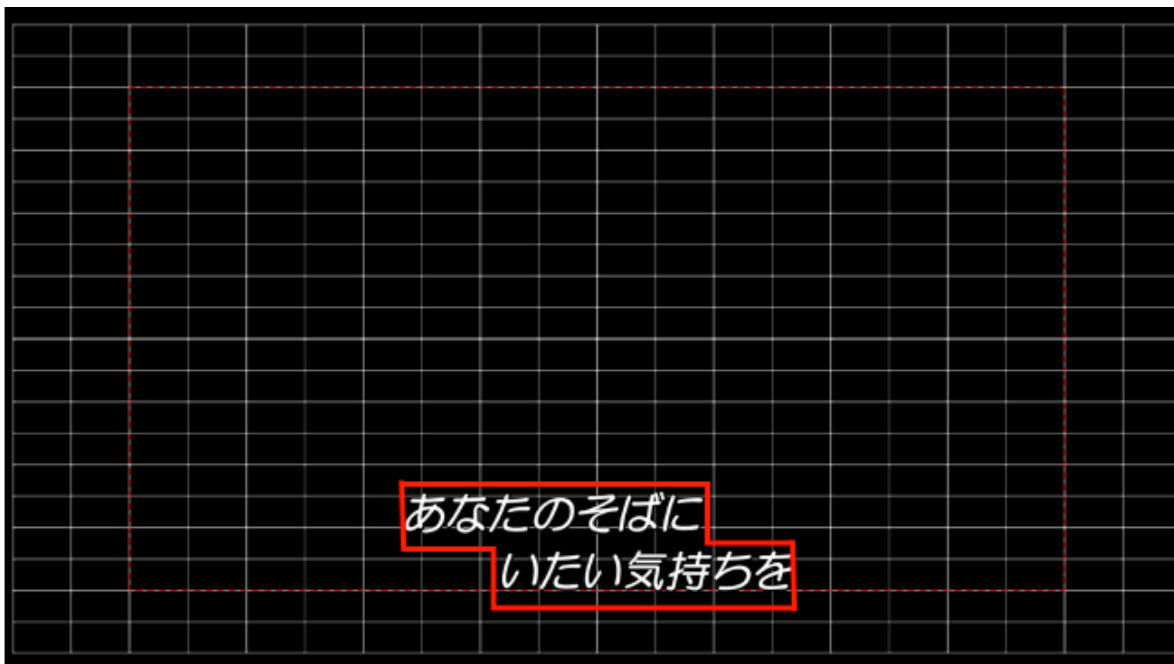


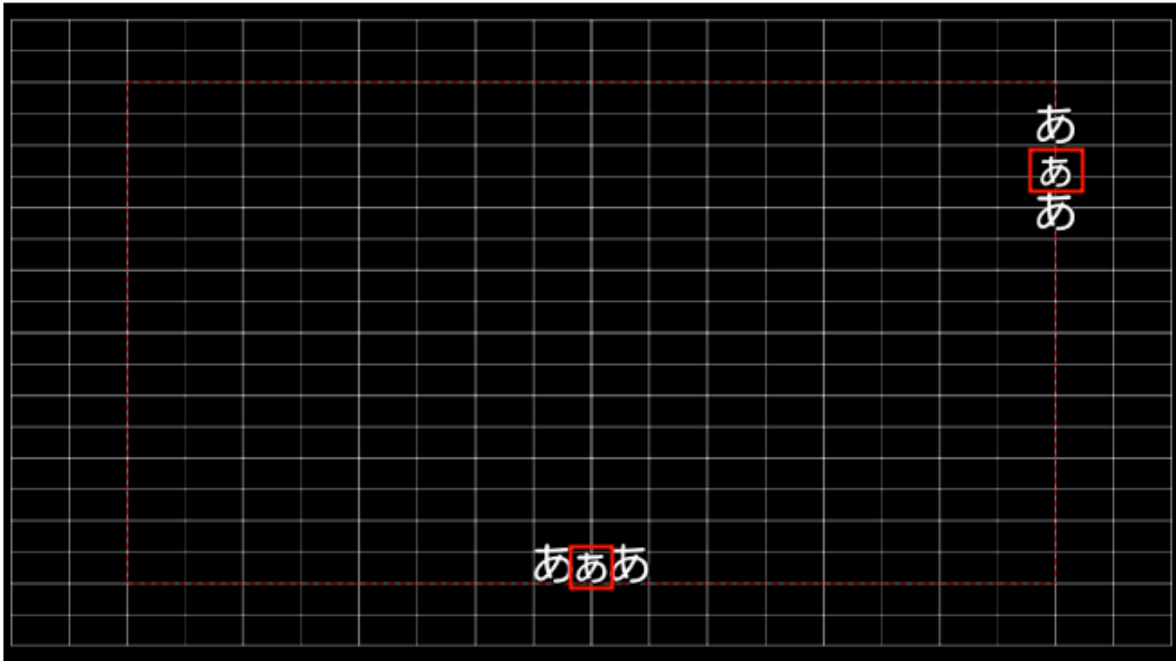
Figure 3 — Chidori-style sample

5.4 Yōon

These twenty characters are smaller versions of Japanese characters that are used when a mora is formed with palatalization or labialization.

EXAMPLE

The Hiragana letter "ぁ" is a Yōon. It is the smaller version of the same Hiragana letter "あ", as shown in [Figure 4](#).

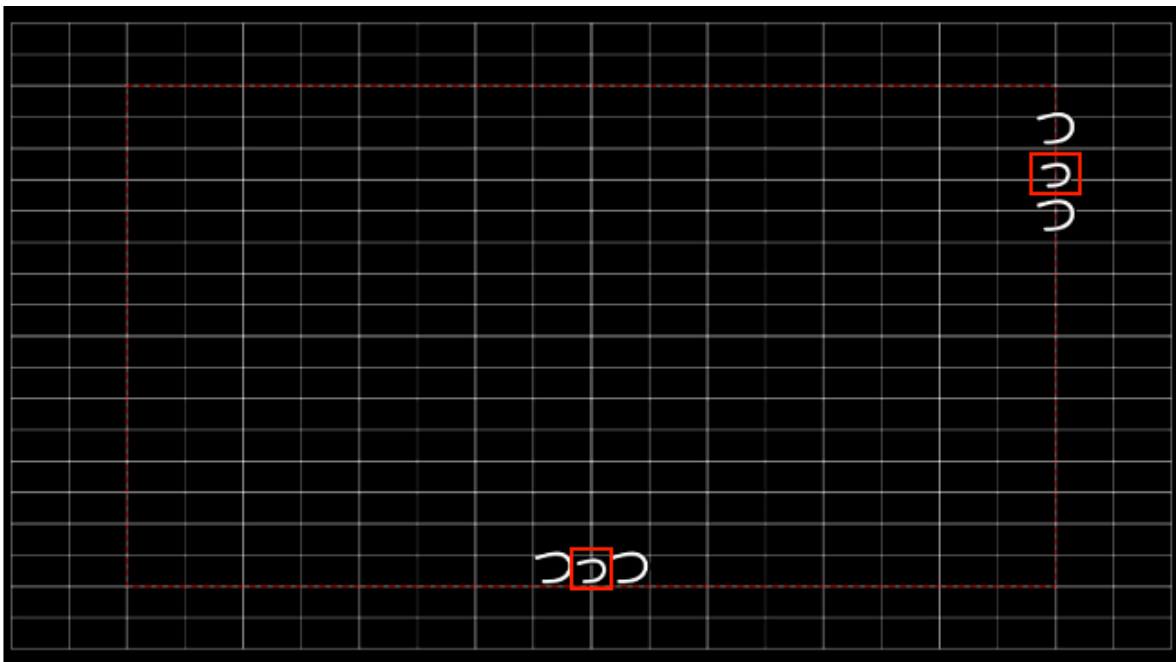
Figure 4 — [Yōon](#) samples

5.5 Sokuon

These two characters are smaller versions of Japanese characters that are used to mark a geminate consonant.

EXAMPLE

Hiragana letter "っ" is a [Sokuon](#). It is the smaller version of the same Hiragana letter "つ", as shown in [Figure 5](#).

Figure 5 — [Sokuon](#) samples

6 XML examples and typical Japanese rendering results

6.1 Vertical Positioning of Vertical Text

6.1.1 Background

Clause 6.3.4 of [SMPTE ST 428-7: 2014](#) states, that when present, the `Vposition` attribute specifies "the distance of the text's baseline from the edge or the center of the primary picture." This requirement differs from prior versions of [SMPTE ST 428-7](#), leading to different subtitle vertical positions, especially in the case of [vertical text](#). This might cause subtitle character(s) to unexpectedly be positioned outside of the primary picture, and therefore partially or entirely hidden by the projection mask.

EXAMPLE

The top subtitle character might be hidden partially when the `Vposition` value is not enough to account for the character's size, used with `Valign="top"`, as shown in [Figure 6](#). And a long subtitle character chain might also be truncated at the bottom edge of the primary picture.

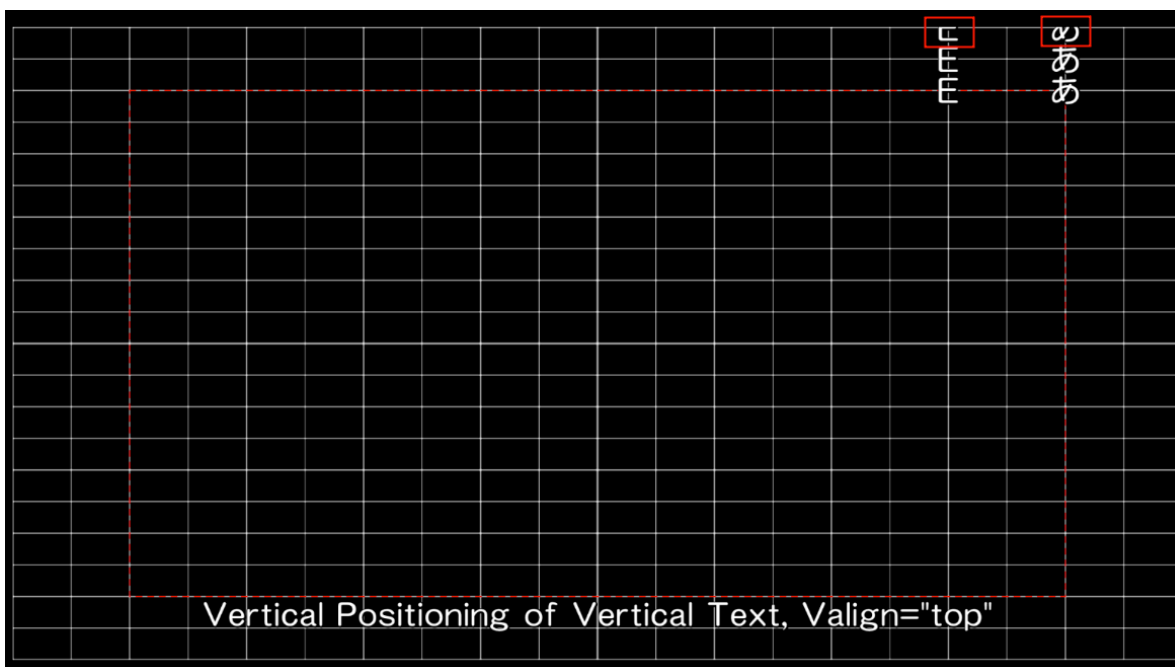


Figure 6 — Example of subtitle characters partially hidden by [Projection Mask](#)

6.1.2 Subtitle vertical positioning when using `Valign="top"`

When defining subtitle vertical positioning using `Valign="top"`, to choose a position that is expected to work on all rendering systems, it is recommended to take into account that the exact subtitle position might vary by one character's "Ascent" height depending on the [SMPTE ST 428-7](#) version implemented.

The example below illustrates results obtained by the implementation of different [SMPTE ST 428-7](#) versions.

EXAMPLE

XML excerpt containing `Vposition` values specified by content creator expecting compliance with [SMPTE ST 428-7: 2014](#):

```

<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="20.00" Zposition="0.00">あああ
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="20.00" Zposition="0.00">E E E
</Text>
<Text Direction="ltr" Halign="center" Hposition="0.00" Valign="bottom" Vposition="5.00"
Zposition="0.00">Vertical Positioning of Vertical Text, Valign="top"</Text>

```

is expected to produce a rendering as shown in [Figure 7](#),

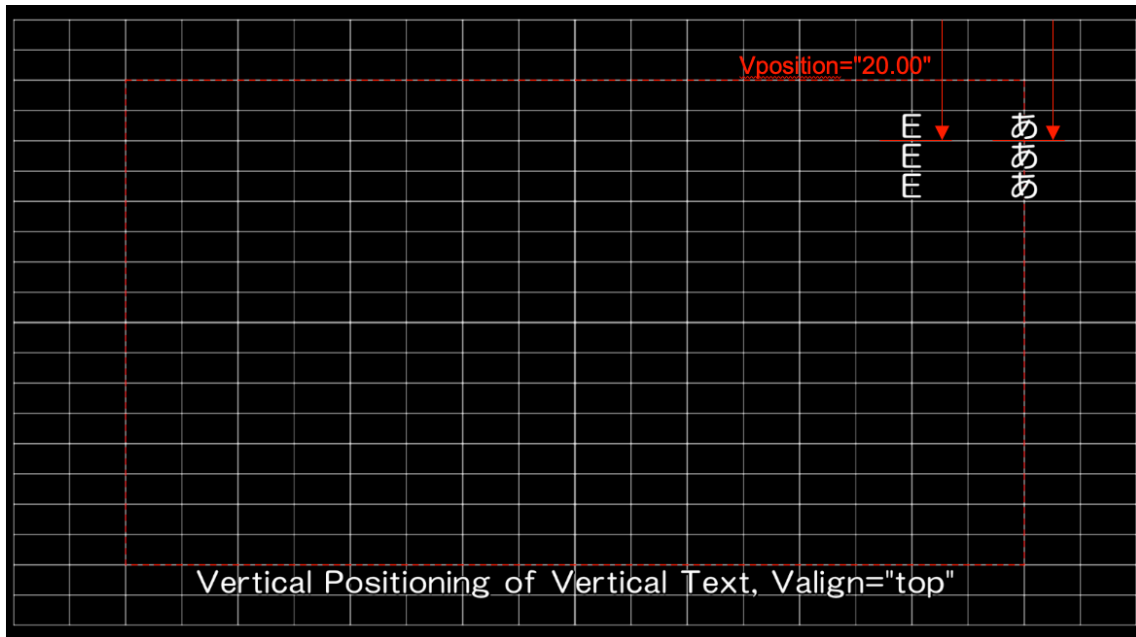


Figure 7 — Desired vertical positioning of vertical text sample

and is NOT expected to produce a rendering as shown in [Figure 8](#) (which is based on the bounding box, "from the side of the primary picture's frame," as specified in [SMPTE ST 428-7: 2010](#)).

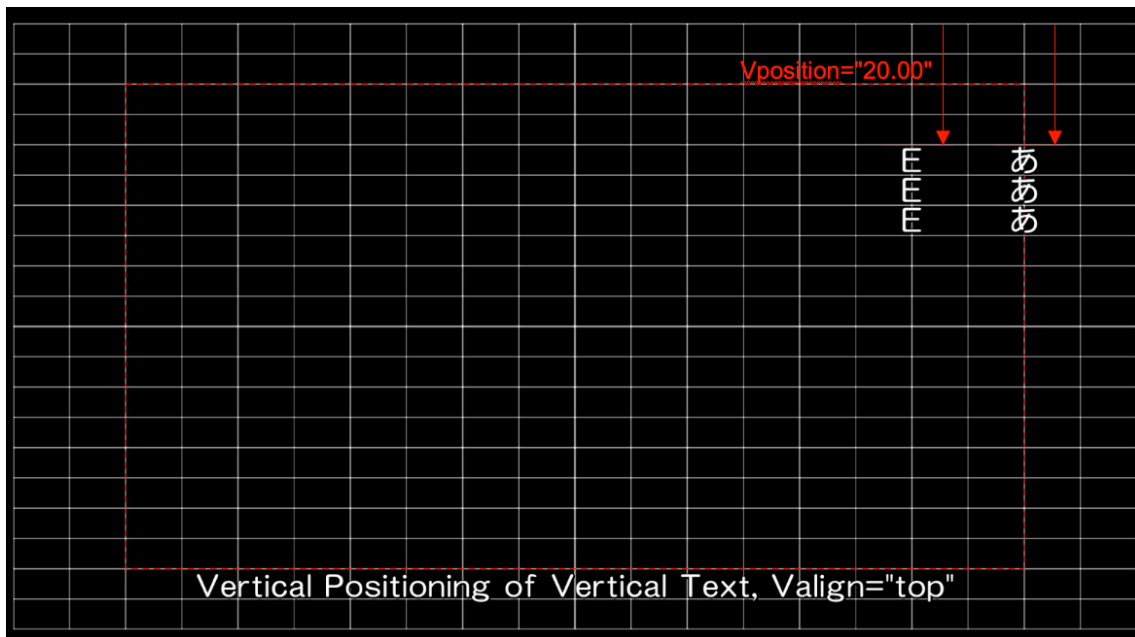


Figure 8 — Undesired vertical positioning of vertical text

6.1.3 Subtitles vertical positioning when using Valign="bottom"

An option to minimize the vertical positioning gap between different [SMPTE ST 428-7](#) versions is to use Valign="bottom" instead of Valign="top". The gap is Descent height in case of Valign="bottom", and is Ascent height in case of Valign="top" as shown in [Figure 9](#).

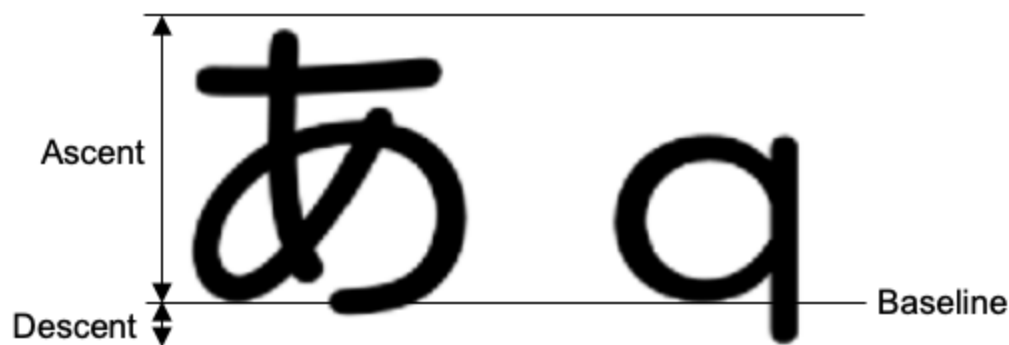


Figure 9 — Ascent vs descent distance illustration

EXAMPLE 1

XML essence containing Valign="bottom" and Vposition values used to illustrate the positioning difference between [SMPTE ST 428-7: 2014](#) and [SMPTE ST 428-7: 2010](#), as shown in [Figure 10](#), [Figure 11](#), and [Figure 12](#):

```
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="bottom" Vposition="70.00" Zposition="0.00">q q
q</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="bottom" Vposition="70.00" Zposition="0.00">ああ
ああ</Text>
<Text Direction="ltr" Halign="center" Hposition="0.00" Valign="bottom" Vposition="5.00"
Zposition="0.00">Vertical Positioning of Vertical Text, Valign="bottom"</Text>
```

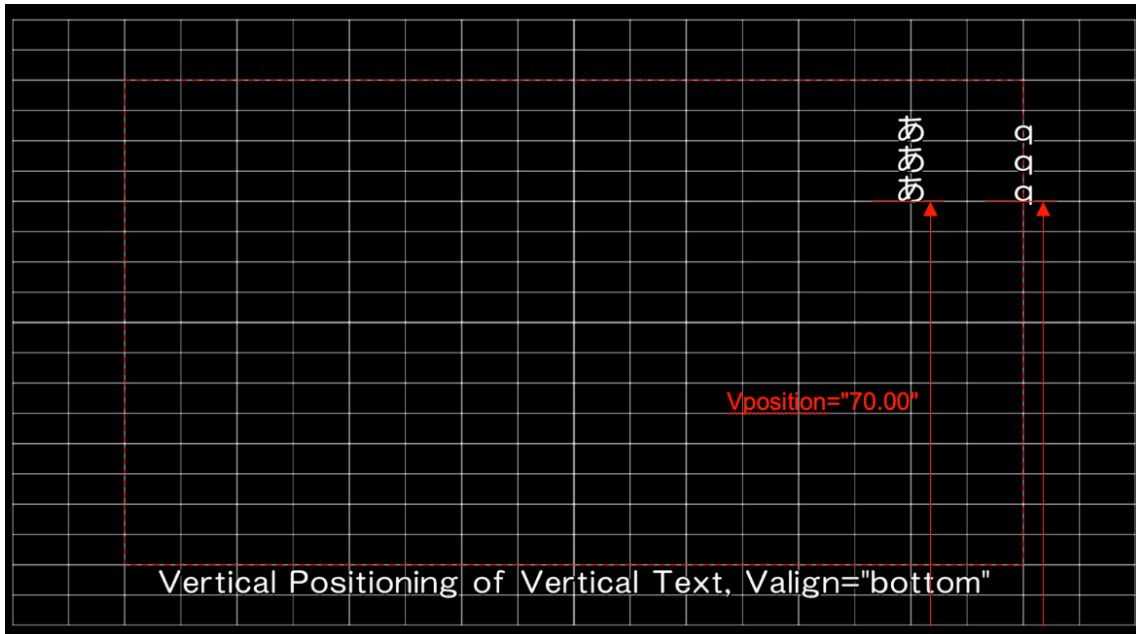


Figure 10 — Example of vertical positioning of vertical text with `Valign="bottom"` and compliance with [SMPTE ST 428-7:2014](#)

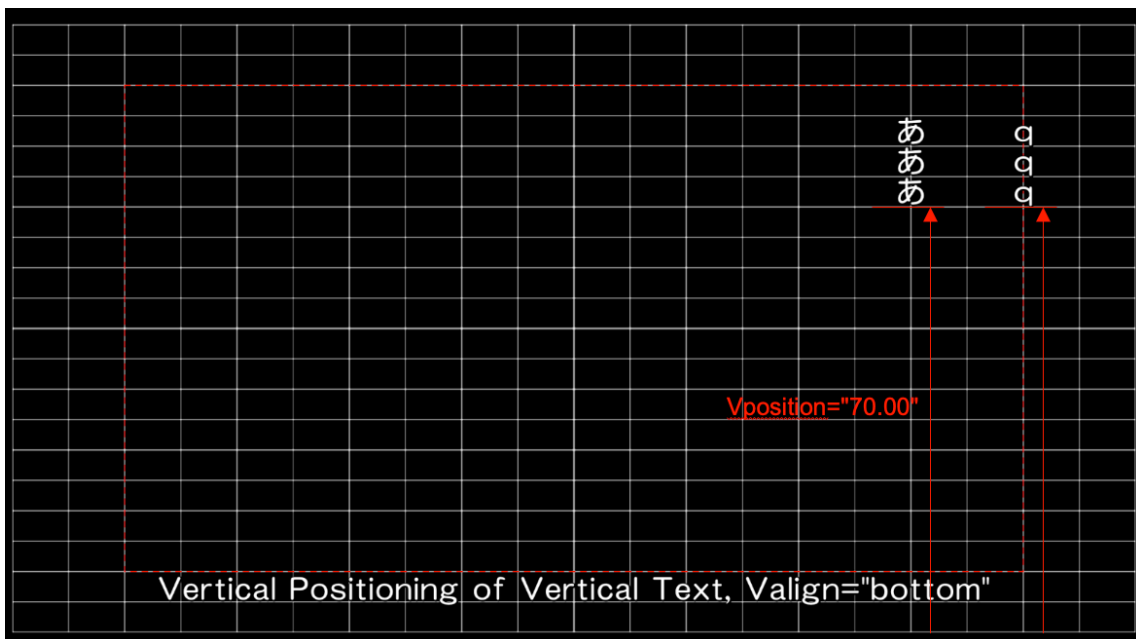


Figure 11 — Example of vertical positioning of vertical text with `Valign="bottom"` and compliance with [SMPTE ST 428-7:2010](#)

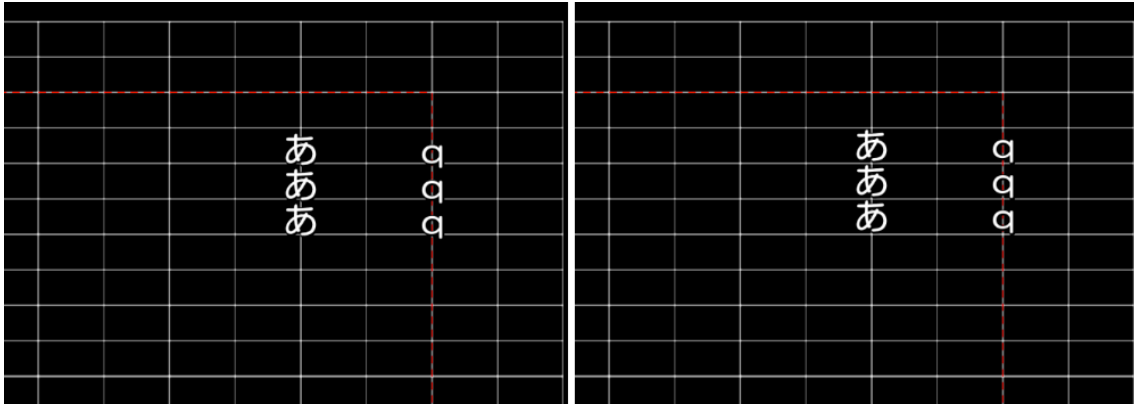


Figure 12 — Example of vertical positioning of vertical text with Valign="bottom" and compliance with [SMPTE ST 428-7: 2014](#) (left) vs [SMPTE ST 428-7: 2010](#) (right)

EXAMPLE 2

XML essence containing Valign="top" and Vposition values used to illustrate the positioning difference between [SMPTE ST 428-7: 2014](#) and [SMPTE ST 428-7: 2010](#), as shown in [Figure 13](#), [Figure 14](#), and [Figure 15](#):

```
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="20.00" Zposition="0.00">q q q
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="20.00" Zposition="0.00">あ あ あ
</Text>
<Text Direction="ltr" Halign="center" Hposition="0.00" Valign="bottom" Vposition="5.00"
Zposition="0.00">Vertical Positioning of Vertical Text, Valign="top"</Text>
```

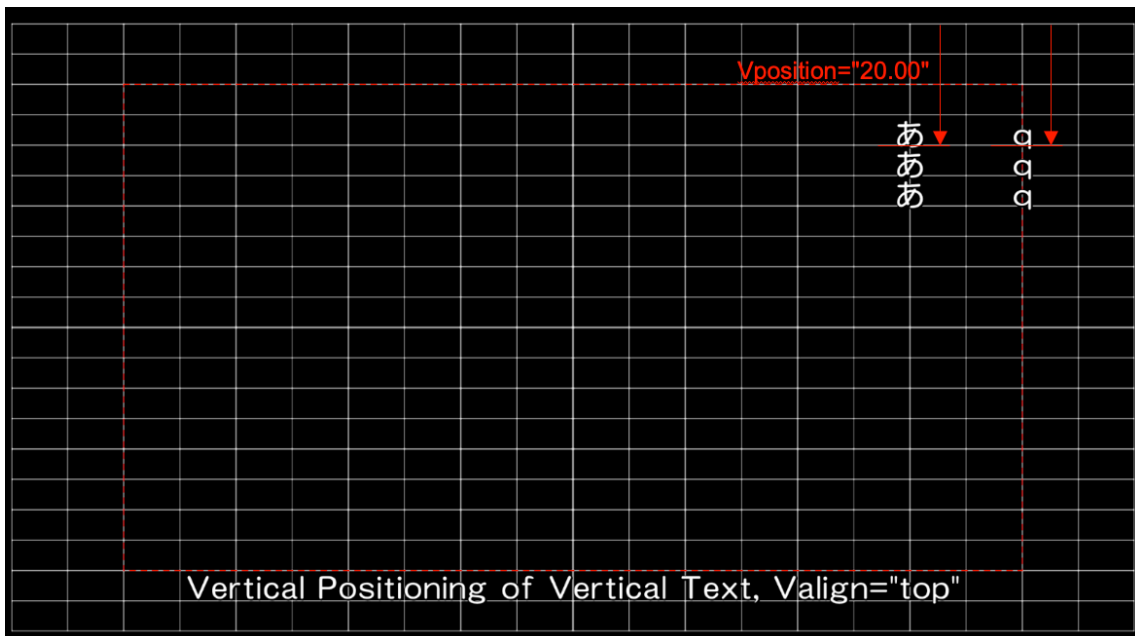


Figure 13 — Example of vertical positioning of vertical text with Valign="top" and compliance with [SMPTE ST 428-7: 2014](#)

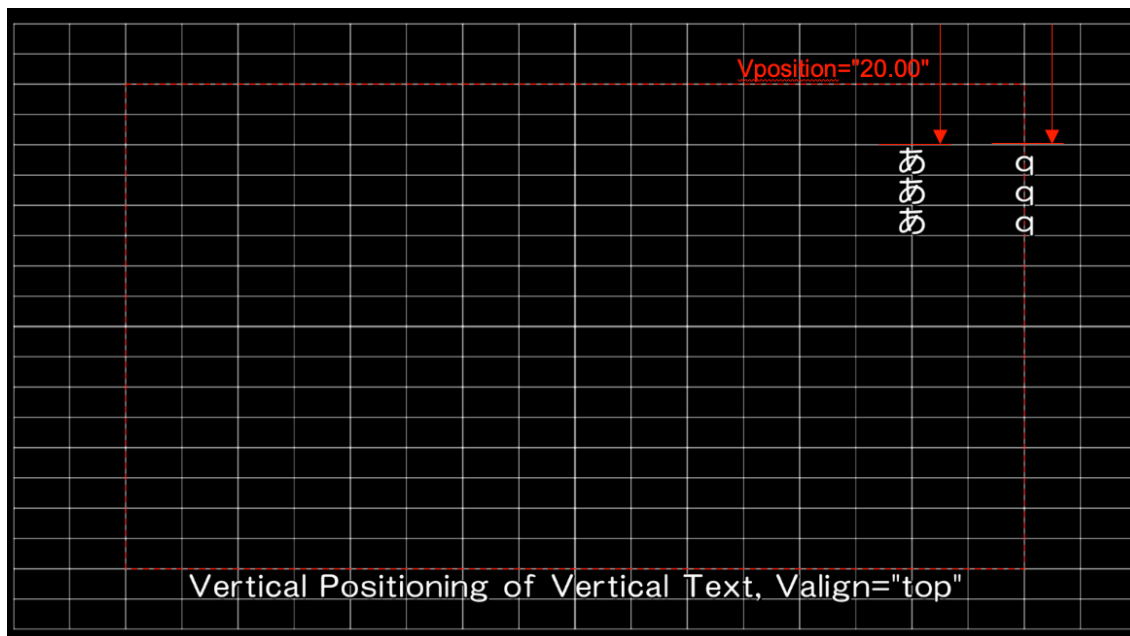


Figure 14 — Example of vertical positioning of vertical text with `Valign="top"` and compliance with [SMPTE ST 428-7: 2010](#)

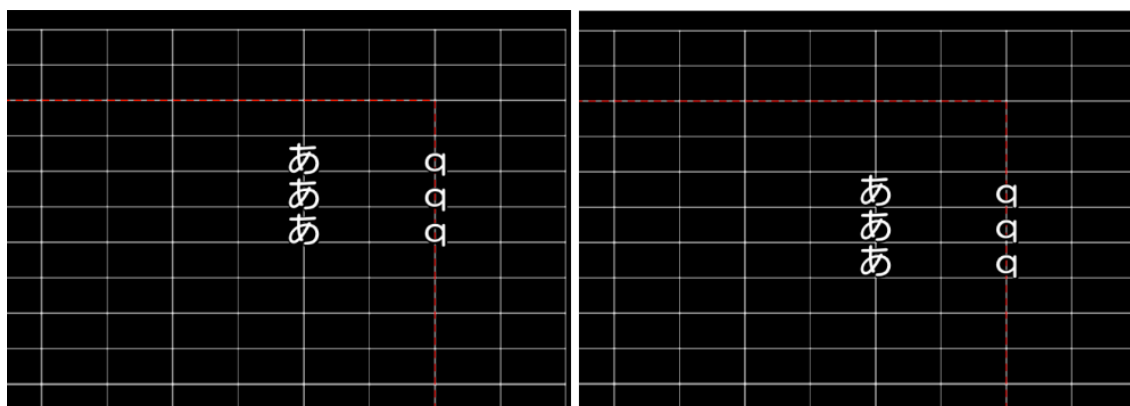


Figure 15 — Example of vertical positioning of vertical text with `Valign="top"` and compliance with [SMPTE ST 428-7: 2014](#) (left) vs [SMPTE ST 428-7: 2010](#) (right)

However, using `Valign="bottom"` could result in top characters of two vertical subtitle character strings to be slightly misaligned, especially when characters listed in [Table 1](#) are used.

**Table 1 — List of characters which could result in top
characters of two vertical subtitle character strings to be
slightly misaligned**

Name	Unicode	Image
------	---------	-------

Left Double Quotation Mark	U+201C	“
Right Double Quotation Mark	U+201D	”
Comma: Presentation Form for Vertical Ideographic Comma	U+FE11	、
<u>Yōon</u> : Hiragana Letter Small A	U+3041	あ
<u>Yōon</u> : Hiragana Letter Small I	U+3043	い
<u>Yōon</u> : Hiragana Letter Small U	U+3045	う
<u>Yōon</u> : Hiragana Letter Small E	U+3047	え
<u>Yōon</u> : Hiragana Letter Small O	U+3049	お
<u>Yōon</u> : Hiragana Letter Small Ya	U+3083	や
<u>Yōon</u> : Hiragana Letter Small Yu	U+3085	ゆ
<u>Yōon</u> : Hiragana Letter Small Yo	U+3087	よ
<u>Yōon</u> : Hiragana Letter Small Wa	U+308E	わ
<u>Yōon</u> : Katakana Letter Small A	U+30A1	ア
<u>Yōon</u> : Katakana Letter Small I	U+30A3	イ
<u>Yōon</u> : Katakana Letter Small U	U+30A5	ウ
<u>Yōon</u> : Katakana Letter Small E	U+30A7	エ
<u>Yōon</u> : Katakana Letter Small O	U+30A9	オ
<u>Yōon</u> : Katakana Letter Small Ya	U+30E3	ヤ
<u>Yōon</u> : Katakana Letter Small Yu	U+30E5	ユ
<u>Yōon</u> : Katakana Letter Small Yo	U+30E7	ヨ
<u>Yōon</u> : Katakana Letter Small Wa	U+30EE	ワ
<u>Yōon</u> : Katakana Letter Small Ka	U+30F5	カ
<u>Yōon</u> : Katakana Letter Small Ke	U+30F6	ケ

Also, as the rendering order will be bottom to top when `Valign="bottom"`, it might result in making characters appear one after the other from bottom to top, as shown in [Figure 16](#), which is very unnatural to the audience even if the display speed is fast.

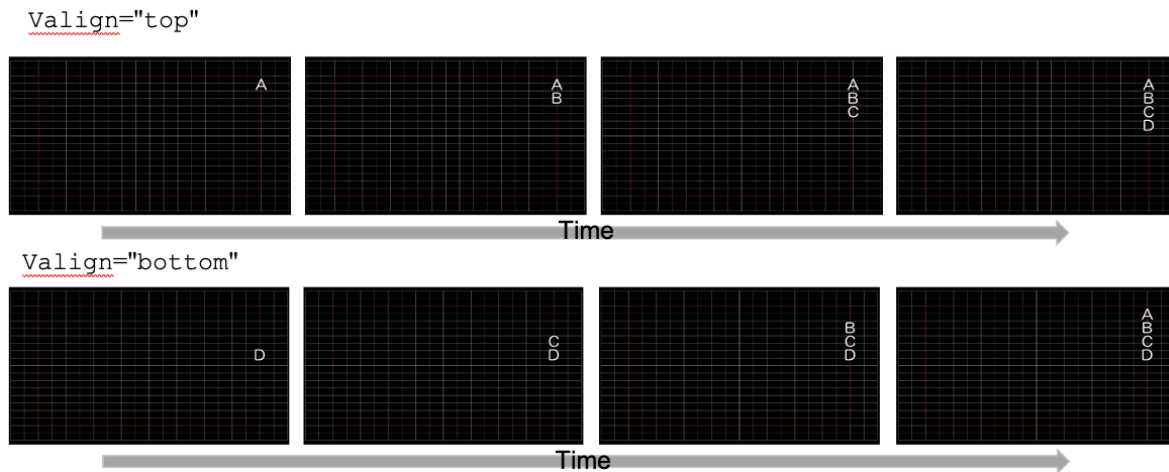


Figure 16 — Difference of rendering order

6.2 Vertical Text intercharacter spacing

Improper intercharacter spacing affects readability. In vertical text particularly, the intercharacter spacing for a very narrow character like "—" (U+4E00) can vary if vertical metrics do not render properly. There are several possible causes, for example, the renderer does not support vertical metrics, vertical metrics were removed during typeface subsetting before making a DCP, or a typeface itself does not include vertical metrics. The use of [TateChuYoko](#) in HGroup elements often causes characters to overlap, especially when italic characters are used.

When using such characters, it is necessary to consider the vertical spacing between characters. For example, for better intercharacter spacing it is recommended to specify each of these possibly mishandled characters using a dedicated Text element and its own Vposition and Hposition specific values in the XML file to avoid collision with characters positioned above or below them. It is not recommended to use Ideographic Space (U+3000) and Space (U+0020) characters, or the Space element for the intercharacter spacing due to uncertain appearance.

EXAMPLE 1

XML file with "—" character, HGroup elements and Italic attribute:

```
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top"
Vposition="20.00" Zposition="0.00">国—国 E—E <HGroup>1234</HGroup></Text>
<Font Italic="yes">
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="20.00" Zposition="0.00">国—国 E
—E <HGroup>1234</HGroup></Text>
</Font>
<Text Direction="ltr" Halign="center" Hposition="0.00" Valign="bottom" Vposition="5.00"
Zposition="0.00">Vertical Intercharacter Spacing</Text>
```

is expected to produce a rendering as shown in [Figure 17](#),

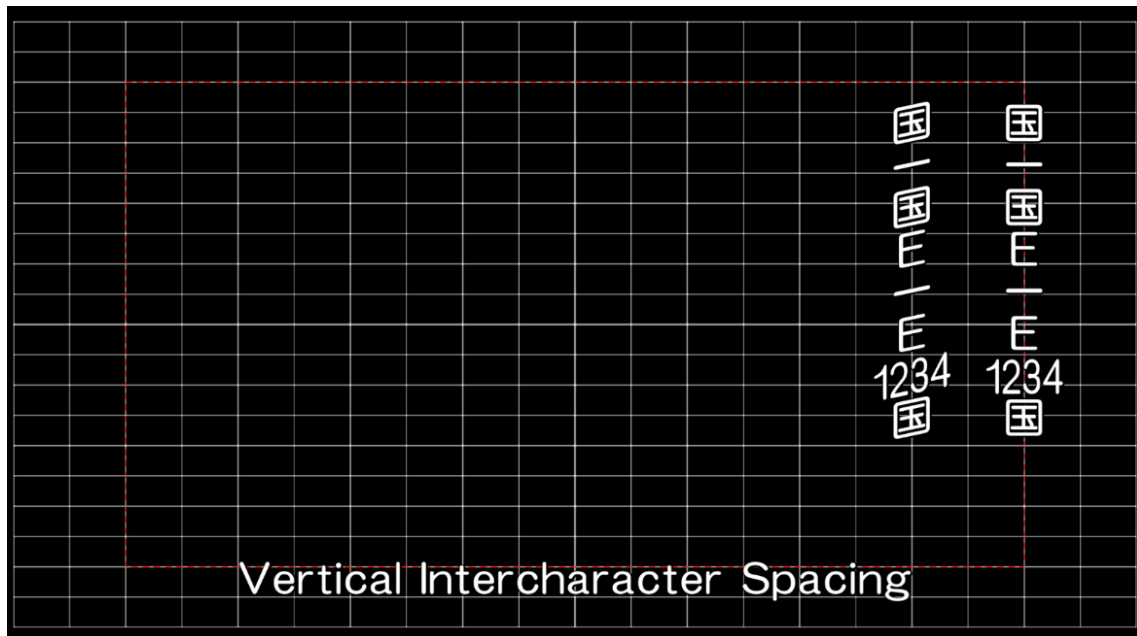


Figure 17 — Desired vertical text intercharacter spacing sample

and is NOT expected to produce a rendering as shown in [Figure 18](#).



Figure 18 — Undesired vertical text intercharacter spacing sample

To achieve the same appearance as shown in [Figure 17](#), specify the `Vposition` values of the character "—" (U+4E00) and each character (or group of characters) before and after using dedicated `Text` elements.

EXAMPLE 2

XML file with a dedicated `Text` element for each character associated with a `Direction` attribute value equal to `ttb` or `btt`:

```

<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="20.00" Zposition="0.00">国
</Text>
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="26.94" Zposition="0.00">—
</Text>
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="33.88" Zposition="0.00">国 E
</Text>
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="47.82" Zposition="0.00">—
</Text>
<Text Direction="ttb" Halign="right" Hposition="10.00" Valign="top" Vposition="54.76" Zposition="0.00">E
<HGroup>1234</HGroup>国</Text>
<Font Italic="yes">
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="20.00" Zposition="0.00">国
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="26.94" Zposition="0.00">—
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="33.88" Zposition="0.00">国 E
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="47.82" Zposition="0.00">—
</Text>
<Text Direction="ttb" Halign="right" Hposition="20.00" Valign="top" Vposition="54.76" Zposition="0.00">E
<HGroup>1234</HGroup>国</Text>
</Font>
<Text Direction="ltr" Halign="center" Hposition="0.00" Valign="bottom" Vposition="5.00"
Zposition="0.00">Vertical Intercharacter Spacing</Text>

```

6.3 Spacing for Chidori-style

The horizontal positioning is based on the bounding box. Neither leading Ideographic Space (U+3000) and Space (U+0020) characters, nor the Space element might increase the size of the bounding box as required to shift the text to the right. It is recommended to use a different Hposition for each line of Chidori-style instead.

EXAMPLE

XML file with different Hposition values for each line of Chidori-style:

```

<Font Italic="yes">
<Text Direction="ltr" Halign="center" Hposition="-4.00" Valign="bottom" Vposition="19.10" Zposition="0.00">あな
たのそばに</Text>
<Text Direction="ltr" Halign="center" Hposition="4.00" Valign="bottom" Vposition="10.00" Zposition="0.00">いた
い気持ちを</Text>
</Font>

```

is expected to produce a rendering as shown in [Figure 19](#),

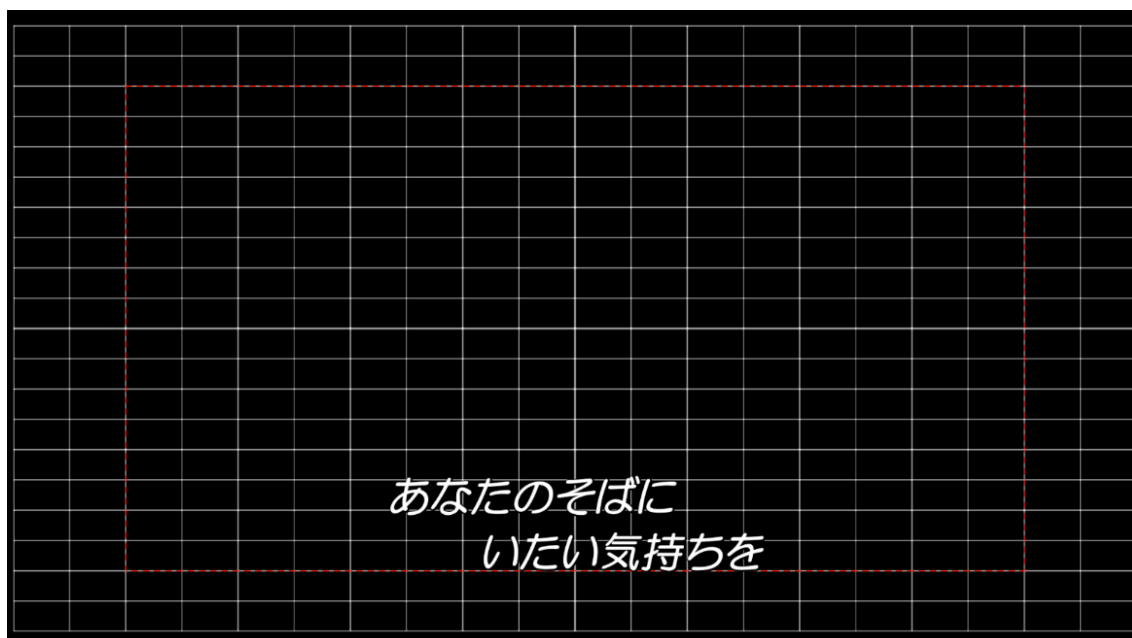


Figure 19 — Desired spacing for [Chidori-style](#)

Bibliography

SMPTE ST 428-7, D-Cinema Distribution Master - Subtitle

url: <https://doi.org/10.5594/SMPTE.ST428-7>

SMPTE ST 429-16, D-Cinema Packaging - Additional Composition Metadata and Guidelines

url: <https://doi.org/10.5594/SMPTE.ST429-16>

SMPTE ST 428-7: 2010, D-Cinema Distribution Master - Subtitle

url: <https://doi.org/10.5594/SMPTE.ST428-7.2010>

SMPTE ST 428-7: 2014, D-Cinema Distribution Master - Subtitle

url: <https://doi.org/10.5594/SMPTE.ST428-7.2014>