Roundtable discussion
New Technologies and Practices for Tablature Encoding

Basel Lute Days - Schola Cantorum Basiliensis
14th September 2022

Laurent Pugin

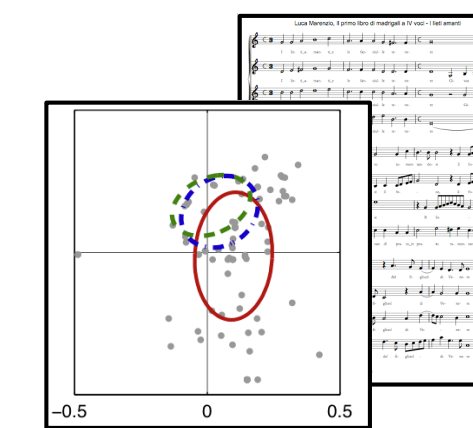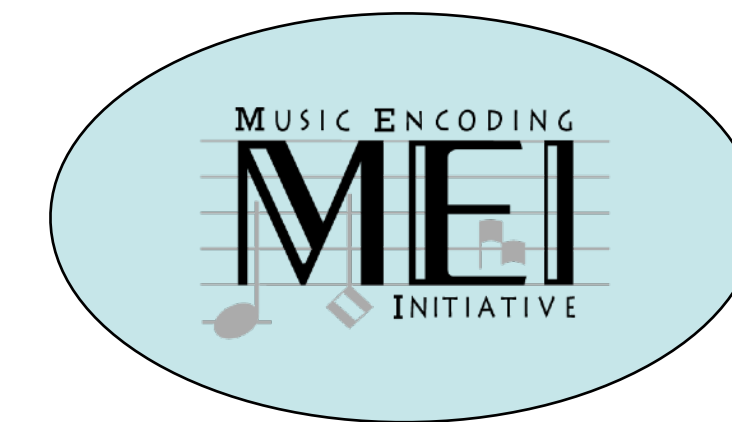**RISM** | DIGITAL CENTER

MEI
Music Encoding Initiative

- Started by Perry Roland at University of Virginia

- Inspired by the Text Encoding Initiative TEI

- Modelling the music notation and representing it digitally in a structured and meaningful way

- Explicit distinction of the various encoding domains (e.g., visual, gestural)

- Coverage of a wide range of applications

- Encoding of common Western music notation, but not only

- Open, community-driven and modular
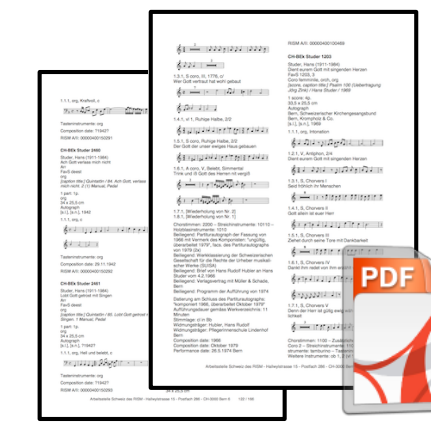
Library catalogs
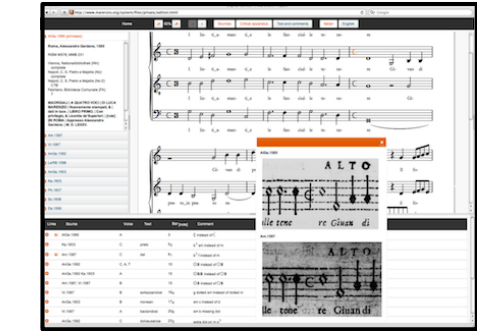
Digital music editions

Analysis and retrieval

Long term archiving

MEI is not …

- … an "official" standard

- … just a file format

A music notation engraving library for MEI

Design principles

Rethinking digital engraving

- Responsive music notation layout – as opposed to page-focused output

Rethinking notation in the digital domain

- Notation as an interaction layer with the MEI code acting as a "semantic" representation

Allowing for modular digital engraving

- Suitable to a wide range of music repertoires and of application types

Based on open standards
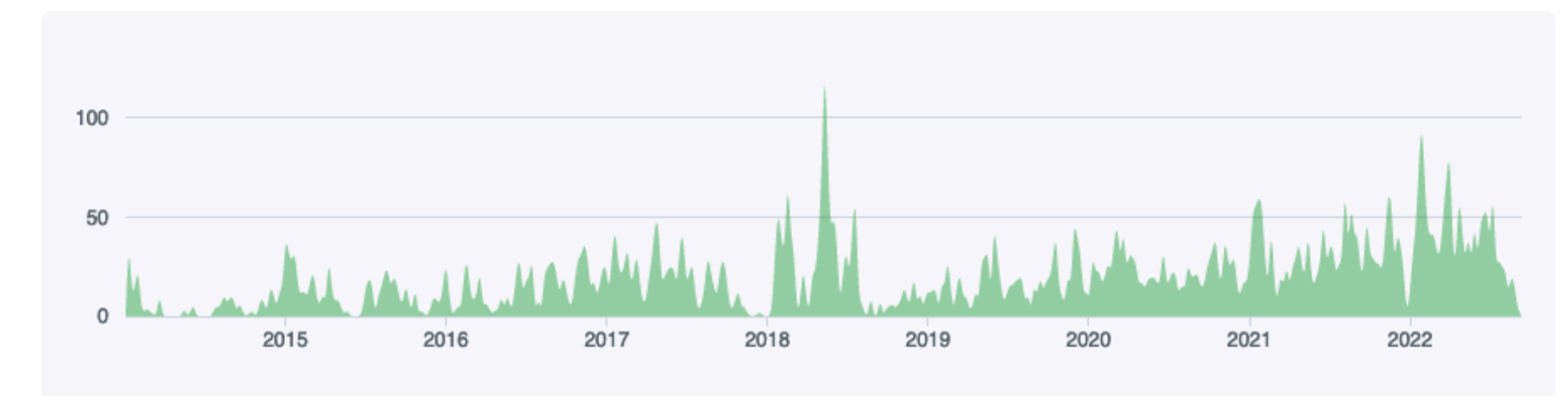
- SMuFL (Standard Music Font Layout)

Open source and community oriented

Contributors 52

Contributions to develop, excluding merge commits and bot accounts

Gagliarda

4

Interactive music notation

- Verovio produces SVG (Scalable Vector Graphics), a vector-based graphics in XML format

- SVG can be used on the the web and is supported by most Internet browsers by default

- It acts as a semantically structured image which can be addressed and modified with standard web technologies
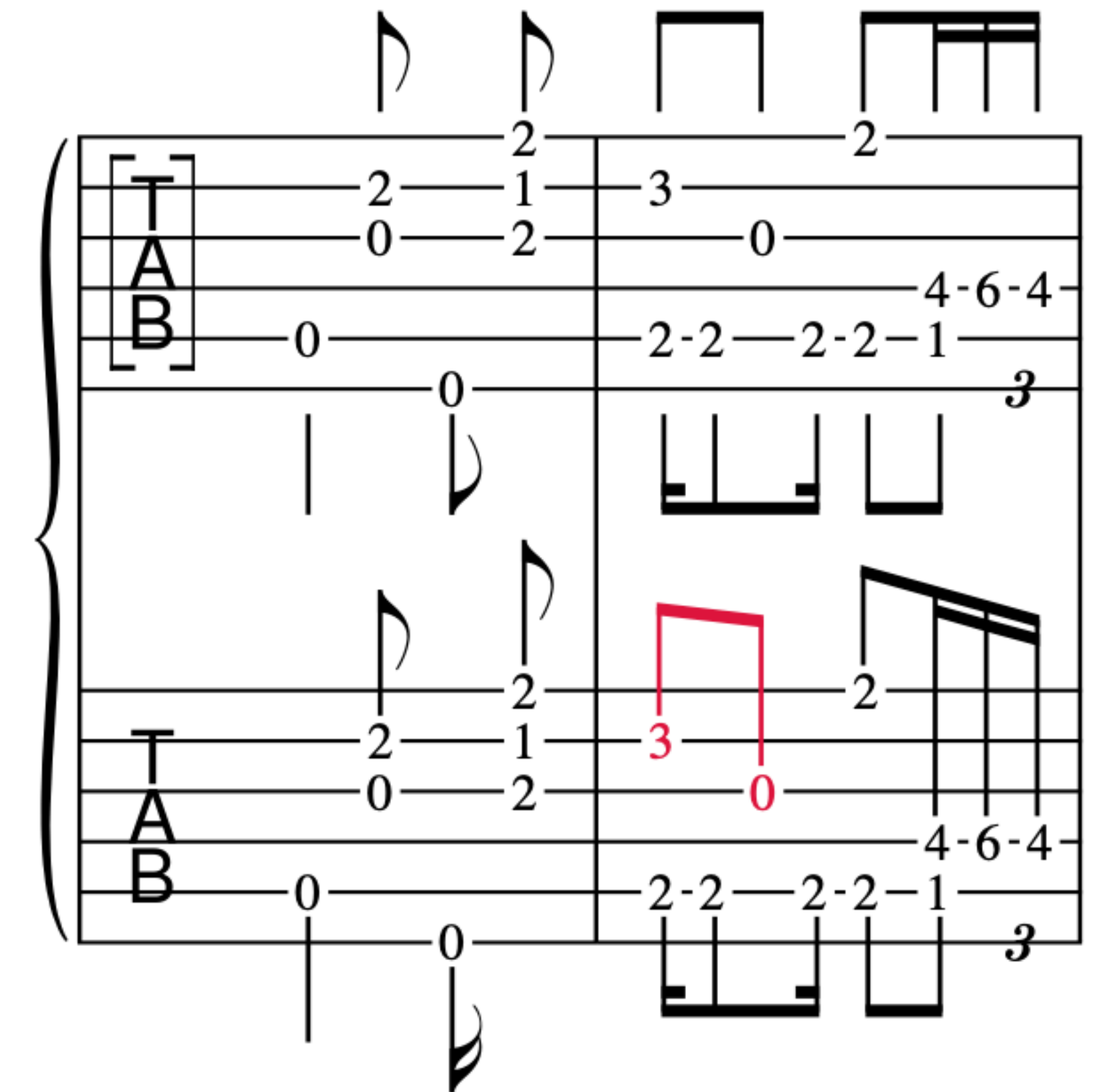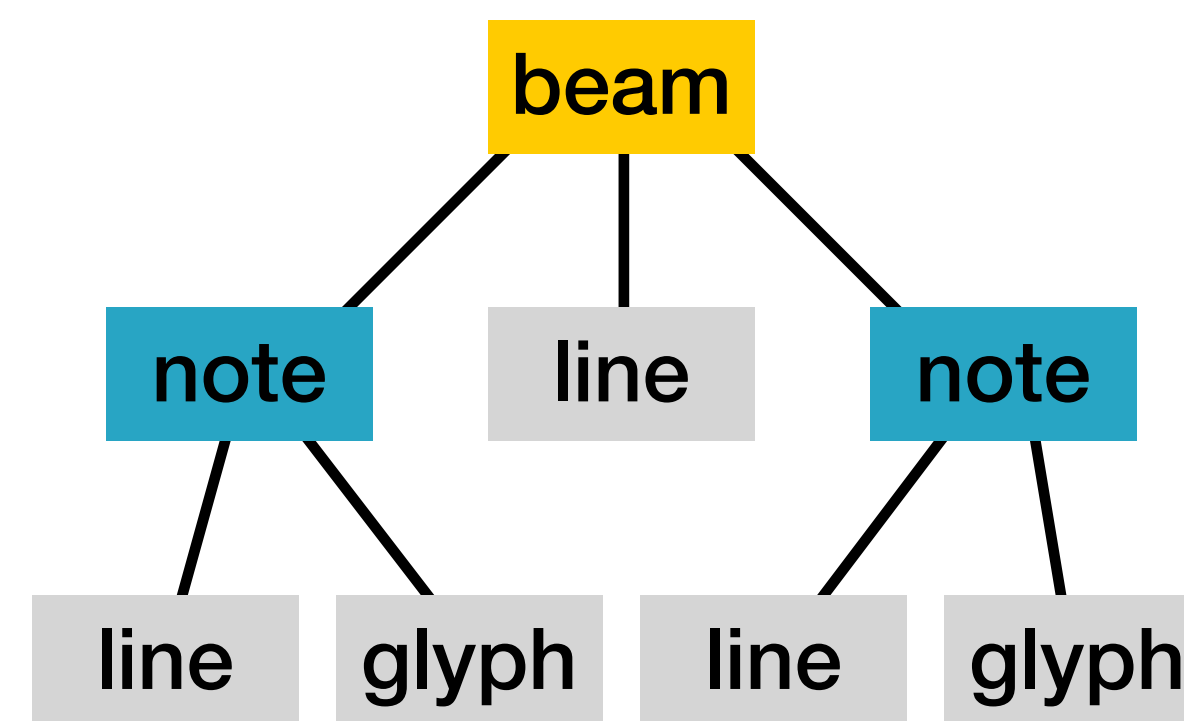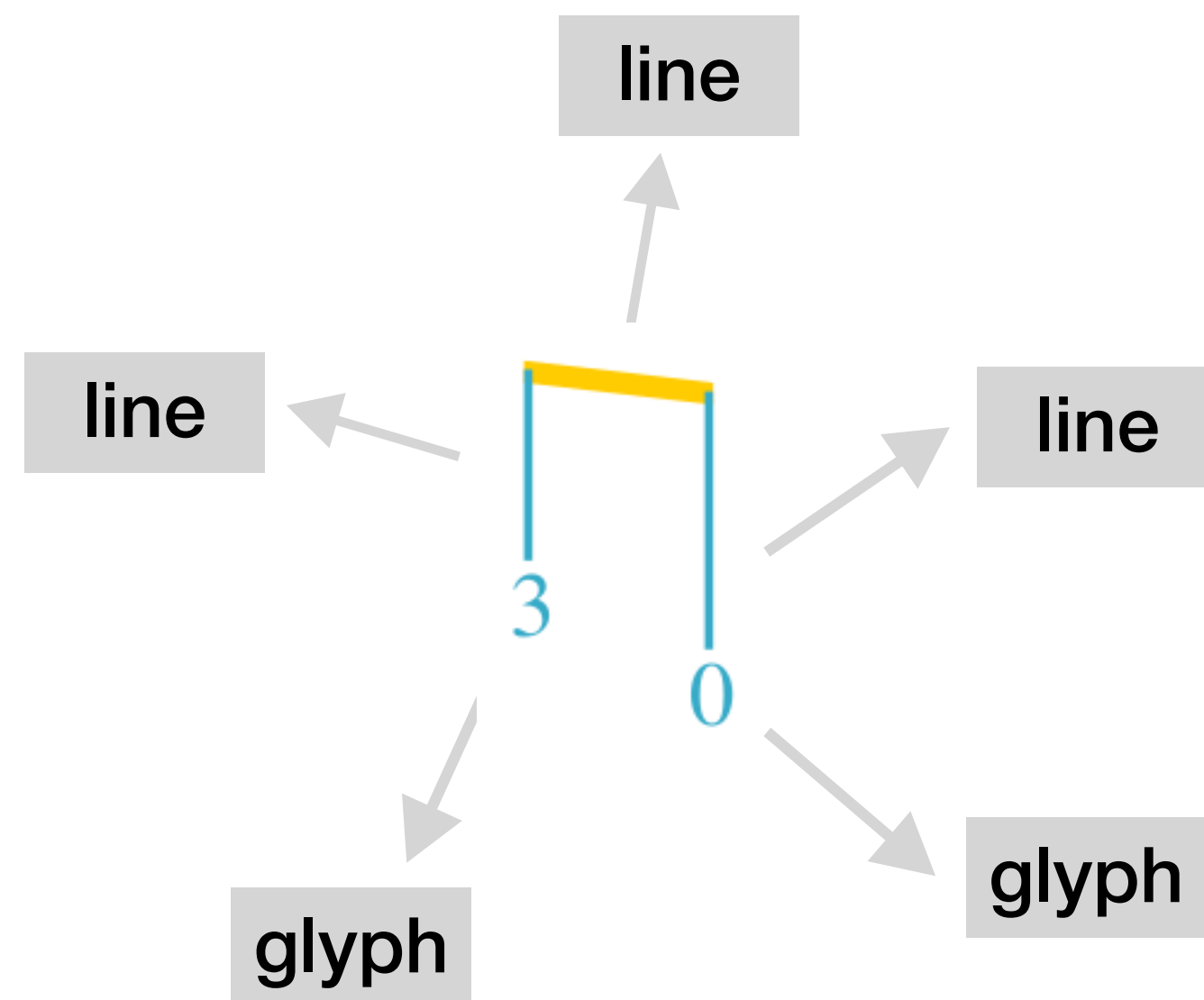
A **beam and its content** can be addressed and modified because the MEI structure is preserved in the SVG image structure

Modular music notation engraving

Measuring Polyphony

Tasso in Music

European Ars Nova

Philippe de Vitry

Marenzio Edition

CRIM Project

SMuFL
Standard Music Font Layout

- Initiated by Steinberg and now developed by the W3C Music Notation Community Group

- Provides a standard way of mapping thousands of musical symbols using the the Unicode Private Use Area

- Provides guidelines and recommendations for metrics, glyph registration and font metadata.

  - "All glyphs should be drawn at a scale consistent with the key measurement that one staff space = 0.25 em."

- Recommends 2,400 glyphs, plus several hundred further optional glyphs
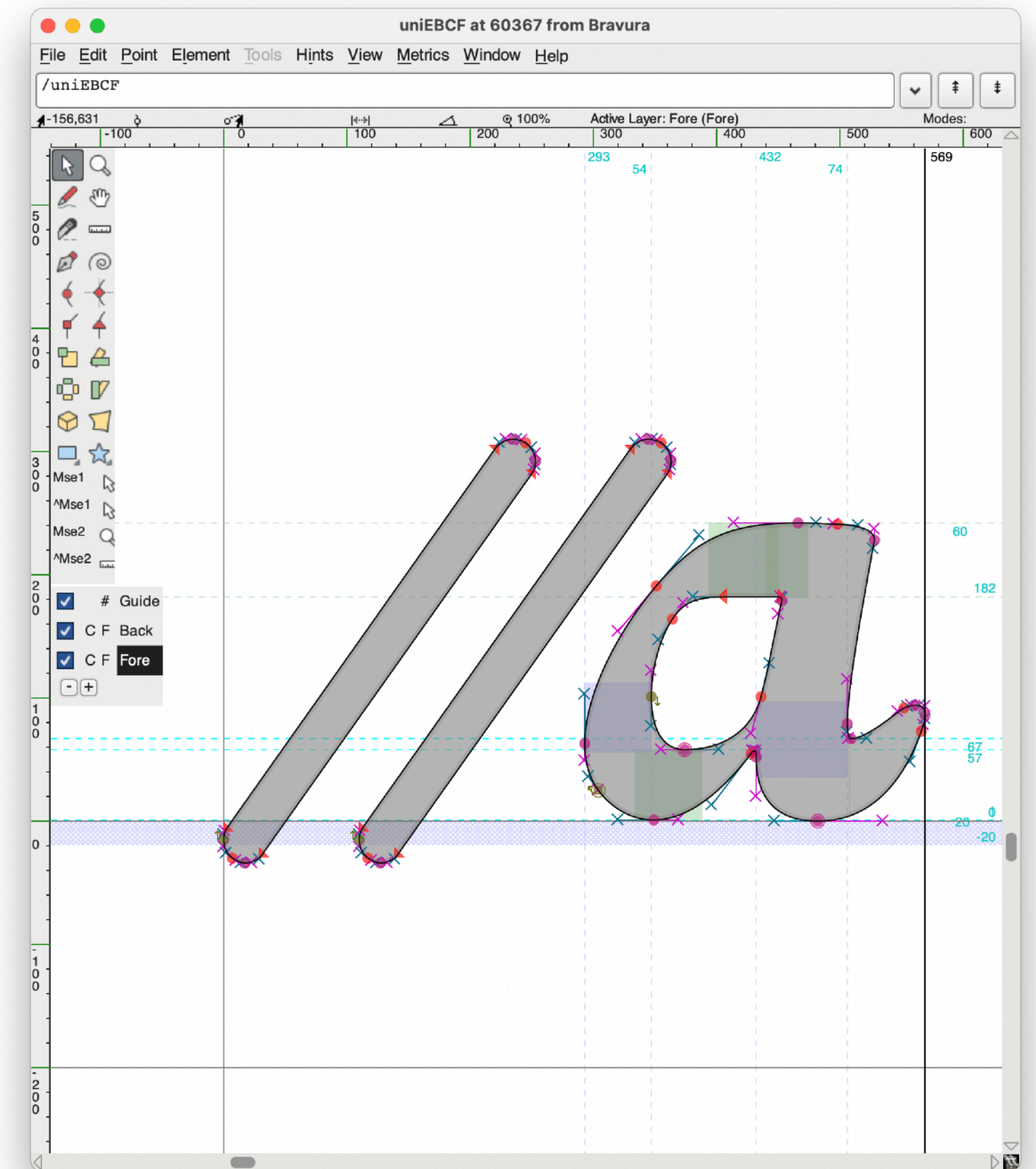
Renaissance lute tablature (U+EBA0–U+EBBF)

Glyph	Description	Glyph	Description
	U+EBA0 *luteStaff6Lines* Lute tablature staff, 6 courses		**U+EBA1** *luteStaff6LinesWide* Lute tablature staff, 6 courses (wide)
	U+EBA2 *luteStaff6LinesNarrow* Lute tablature staff, 6 courses (narrow)		**U+EBA3** *luteBarlineStartRepeat* Lute tablature start repeat barline
	U+EBA4 *luteBarlineEndRepeat* Lute tablature end repeat barline		**U+EBA5** *luteBarlineFinal* Lute tablature final barline
1	**U+EBA6** *luteDurationDoubleWhole* Double whole note (breve) duration sign	|	**U+EBA7** *luteDurationWhole* Whole note (semibreve) duration sign
⌐	**U+EBA8** *luteDurationHalf* Half note (minim) duration sign		**U+EBA9** *luteDurationQuarter* Quarter note (crotchet) duration sign
	U+EBAA *luteDuration8th* Eighth note (quaver) duration sign		**U+EBAB** *luteDuration16th* 16th note (semiquaver) duration sign
	U+EBAC *luteDuration32nd* 32nd note (demisemiquaver) duration sign	┃	**U+EBAD** *luteFingeringRHThumb* Right-hand fingering, thumb
.	**U+EBAE** *luteFingeringRHFirst* Right-hand fingering, first finger	..	**U+EBAF** *luteFingeringRHSecond* Right-hand fingering, second finger
...	**U+EBB0** *luteFingeringRHThird* Right-hand fingering, third finger		

Recommended stylistic alternates

Glyph	Description	Glyph	Description
∵	**uniEBB0.salt01** *luteFingeringRHThirdAlt* Right-hand fingering, third finger (alternate)		

Italian and Spanish Renaissance lute tablature (U+EBE0–U+EBFF)

Glyph	Description	Glyph	Description
0	**U+EBE0** *luteItalianFret0* Open string (0)	1	**U+EBE1** *luteItalianFret1* First fret (1)
2	**U+EBE2** *luteItalianFret2* Second fret (2)	3	**U+EBE3** *luteItalianFret3* Third fret (3)
4	**U+EBE4** *luteItalianFret4* Fourth fret (4)	5	**U+EBE5** *luteItalianFret5* Fifth fret (5)
6	**U+EBE6** *luteItalianFret6* Sixth fret (6)	7	**U+EBE7** *luteItalianFret7* Seventh fret (7)
8	**U+EBE8** *luteItalianFret8* Eighth fret (8)	9	**U+EBE9** *luteItalianFret9* Ninth fret (9)
Ø	**U+EBEA** *luteItalianTempoFast* Fast tempo indication (de Mudarra)	Ø	**U+EBEB** *luteItalianTempoSomewhatFast* Somewhat fast tempo indication (de Narvaez)
C	**U+EBEC** *luteItalianTempoNeitherFastNorSlow* Neither fast nor slow tempo indication (de Mudarra)	Ȼ	**U+EBED** *luteItalianTempoSlow* Slow tempo indication (de Mudarra)
Ȼ	**U+EBEE** *luteItalianTempoVerySlow* Very slow indication (de Narvaez)	3	**U+EBEF** *luteItalianTimeTriple* Triple time indication
❖	**U+EBF0** *luteItalianClefFFaUt* F fa ut clef	♯	**U+EBF1** *luteItalianClefCSolFaUt* C sol fa ut clef
..	**U+EBF2** *luteItalianTremolo* Single-finger tremolo or mordent	+	**U+EBF3** *luteItalianHoldNote* Hold note
‿	**U+EBF4** *luteItalianHoldFinger* Hold finger in place	⌒	**U+EBF5** *luteItalianReleaseFinger* Release finger

German Renaissance lute tablature (U+EC00–U+EC2F)

Glyph	Description	Glyph	Description
α	**U+EC00** *luteGermanALower* 5th course, 1st fret (a)	b	**U+EC01** *luteGermanBLower* 4th course, 1st fret (b)
c	**U+EC02** *luteGermanCLower* 3rd course, 1st fret (c)	ð	**U+EC03** *luteGermanDLower* 2nd course, 1st fret (d)
e	**U+EC04** *luteGermanELower* 1st course, 1st fret (e)	f	**U+EC05** *luteGermanFLower* 5th course, 2nd fret (f)
g	**U+EC06** *luteGermanGLower* 4th course, 2nd fret (g)	ħ	**U+EC07** *luteGermanHLower* 3rd course, 2nd fret (h)
ʄ	**U+EC08** *luteGermanILower* 2nd course, 2nd fret (i)	ɬ	**U+EC09** *luteGermanKLower* 1st course, 2nd fret (k)
l	**U+EC0A** *luteGermanLLower* 5th course, 3rd fret (l)	m	**U+EC0B** *luteGermanMLower* 4th course, 3rd fret (m)
n	**U+EC0C** *luteGermanNLower* 3rd course, 3rd fret (n)	o	**U+EC0D** *luteGermanOLower* 2nd course, 3rd fret (o)
p	**U+EC0E** *luteGermanPLower* 1st course, 3rd fret (p)	q	**U+EC0F** *luteGermanQLower* 5th course, 4th fret (q)
r	**U+EC10** *luteGermanRLower* 4th course, 4th fret (r)	ſ	**U+EC11** *luteGermanSLower* 3rd course, 4th fret (s)
t	**U+EC12** *luteGermanTLower* 2nd course, 4th fret (t)	v	**U+EC13** *luteGermanVLower* 1st course, 4th fret (v)
x	**U+EC14** *luteGermanXLower* 5th course, 5th fret (x)	y	**U+EC15** *luteGermanYLower* 4th course, 5th fret (y)
ȝ	**U+EC16** *luteGermanZLower* 3rd course, 5th fret (z)	𝔄	**U+EC17** *luteGermanAUpper* 6th course, 1st fret (A)

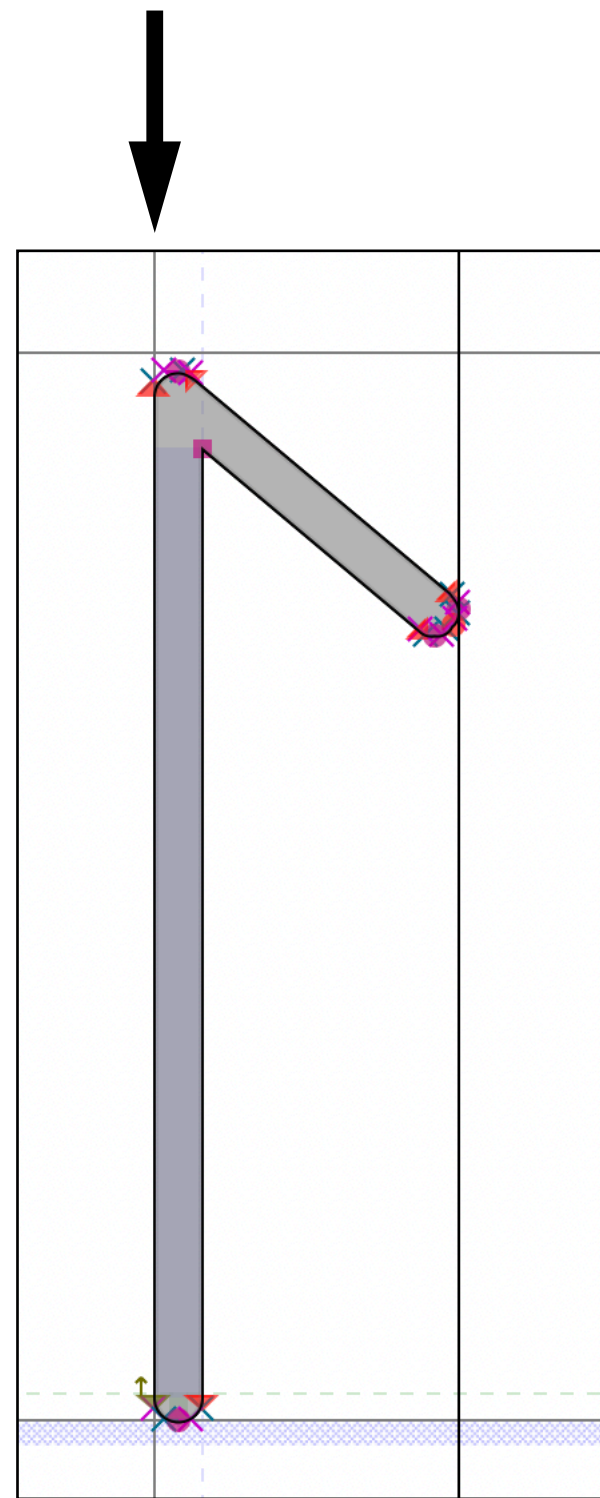# SMuFL is a font specification, it is not a font!

French and English Renaissance lute tablature (U+EBC0–U+EBDF)

| Glyph	Description	Glyph	Description
a	**U+EBC0** *luteFrenchFretA* Open string (a)	b	**U+EBC1** *luteFrenchFretB* First fret (b)
c	**U+EBC2** *luteFrenchFretC* Second fret (c)	ꝺ	**U+EBC3** *luteFrenchFretD* Third fret (d)
e	**U+EBC4** *luteFrenchFretE* Fourth fret (e)	f	**U+EBC5** *luteFrenchFretF* Fifth fret (f)
g	**U+EBC6** *luteFrenchFretG* Sixth fret (g)	h	**U+EBC7** *luteFrenchFretH* Seventh fret (h)
i	**U+EBC8** *luteFrenchFretI* Eighth fret (i)	k	**U+EBC9** *luteFrenchFretK* Ninth fret (k)
ℓ	**U+EBCA** *luteFrenchFretL* 10th fret (l)	m	**U+EBCB** *luteFrenchFretM* 11th fret (m)
n	**U+EBCC** *luteFrenchFretN* 12th fret (n)	a	**U+EBCD** *luteFrench7thCourse* Seventh course (diapason)
/a	**U+EBCE** *luteFrench8thCourse* Eighth course (diapason)	//a	**U+EBCF** *luteFrench9thCourse* Ninth course (diapason)
///a	**U+EBD0** *luteFrench10thCourse* 10th course (diapason)	×	**U+EBD1** *luteFrenchMordentUpper* Mordent with upper auxiliary
⚹	**U+EBD2** *luteFrenchMordentLower* Mordent with lower auxiliary	7	**U+EBD3** *luteFrenchMordentInverted* Inverted mordent
⊣	**U+EBD4** *luteFrenchAppoggiaturaBelow* Appoggiatura from below	♯	**U+EBD5** *luteFrenchAppoggiaturaAbove* Appoggiatura from above
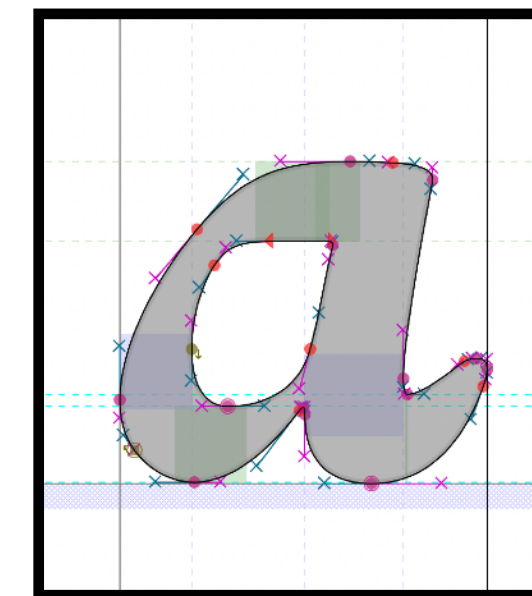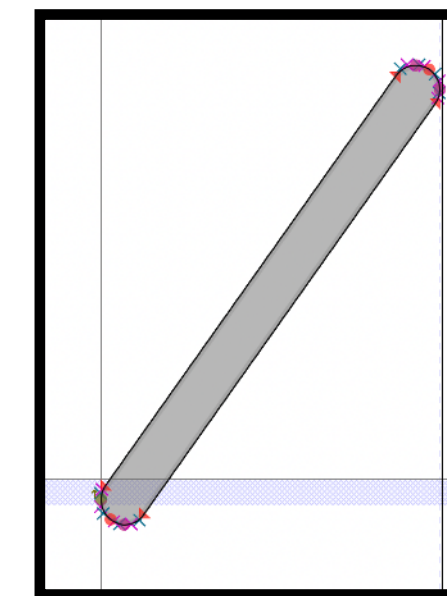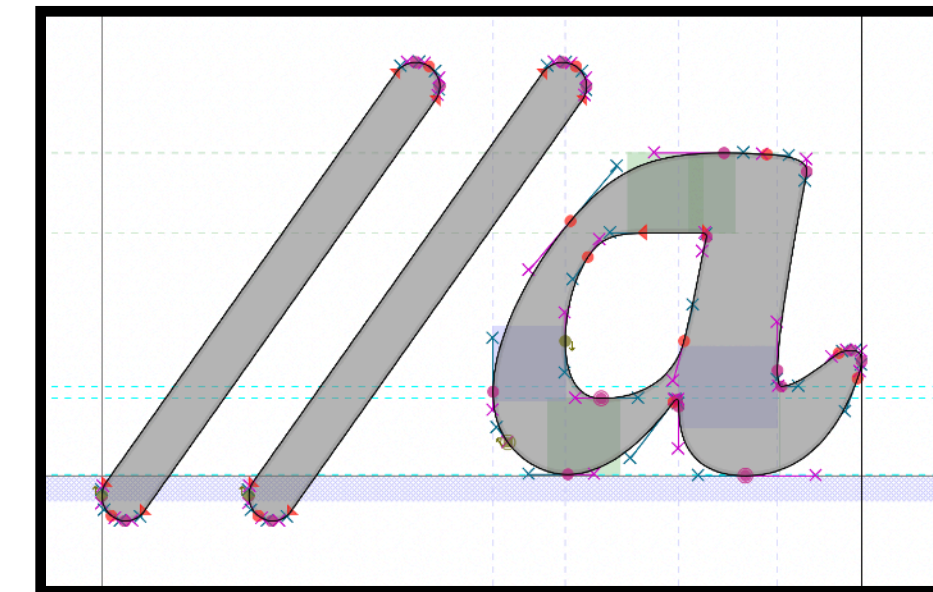
Glyph positioning

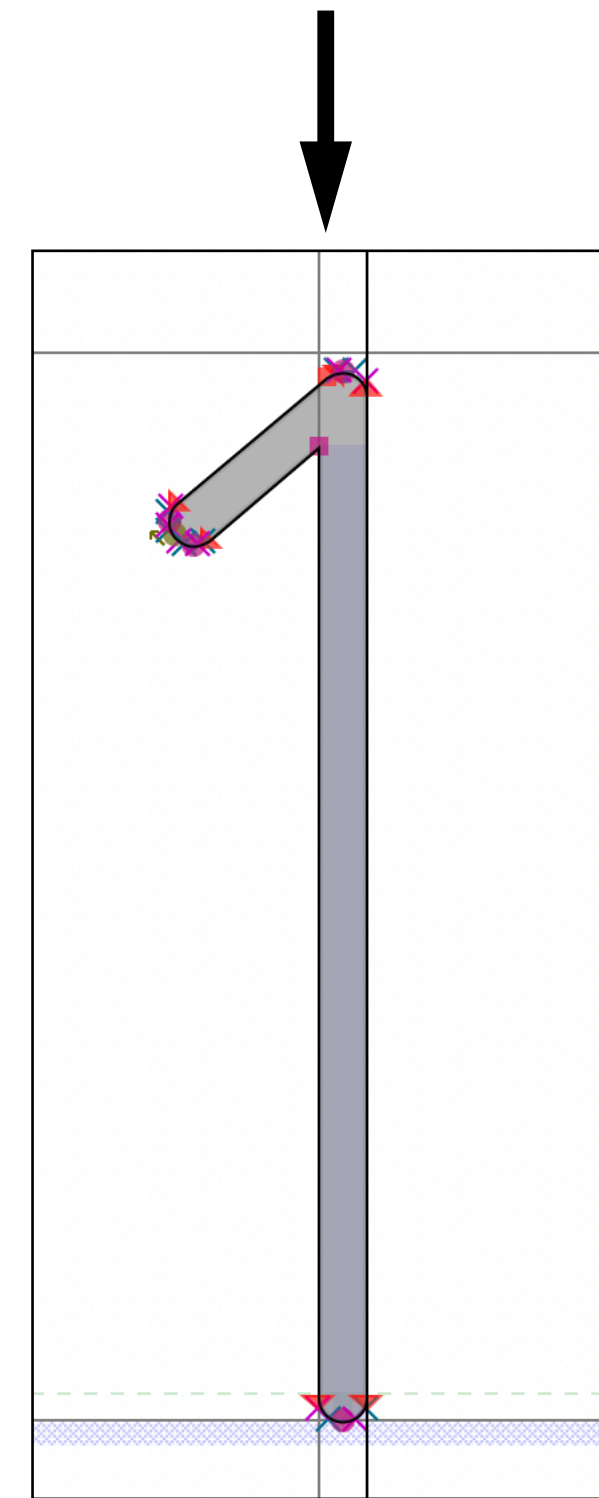Glyph origin
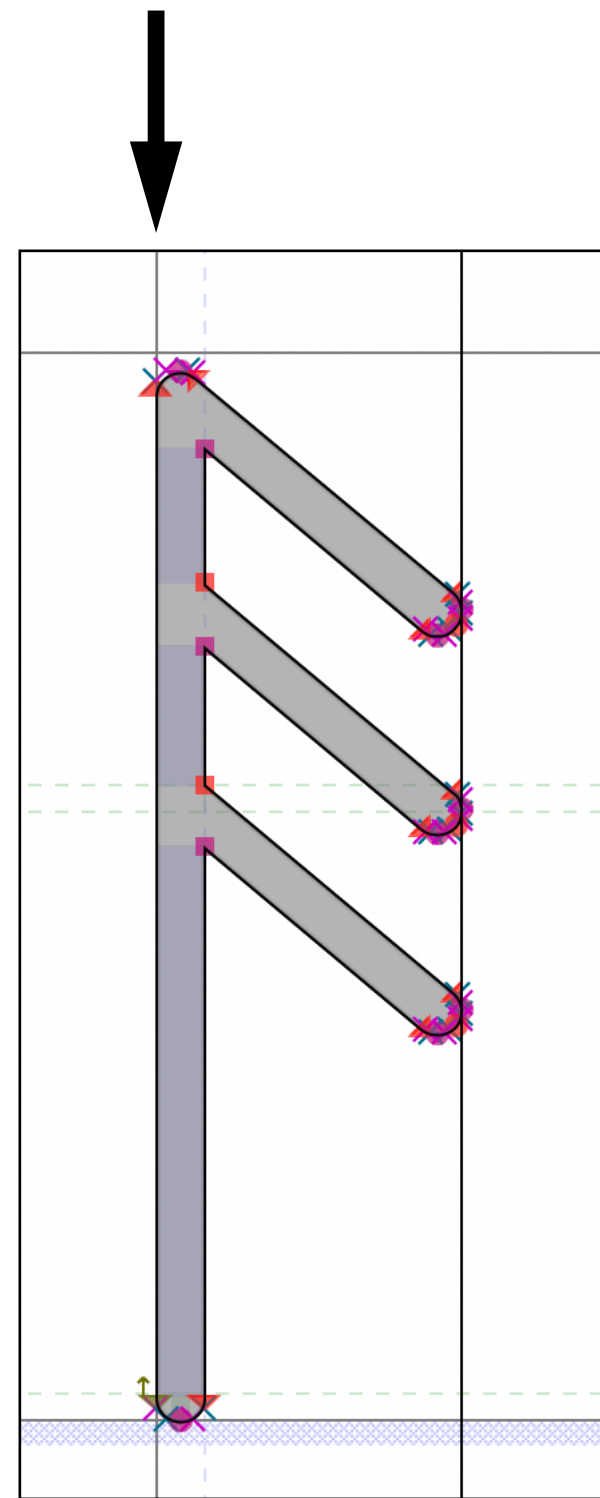
Current specification

Desired specification?

luteDurationHalf   *luteDuration8th*   *luteDurationDoubleWhole*
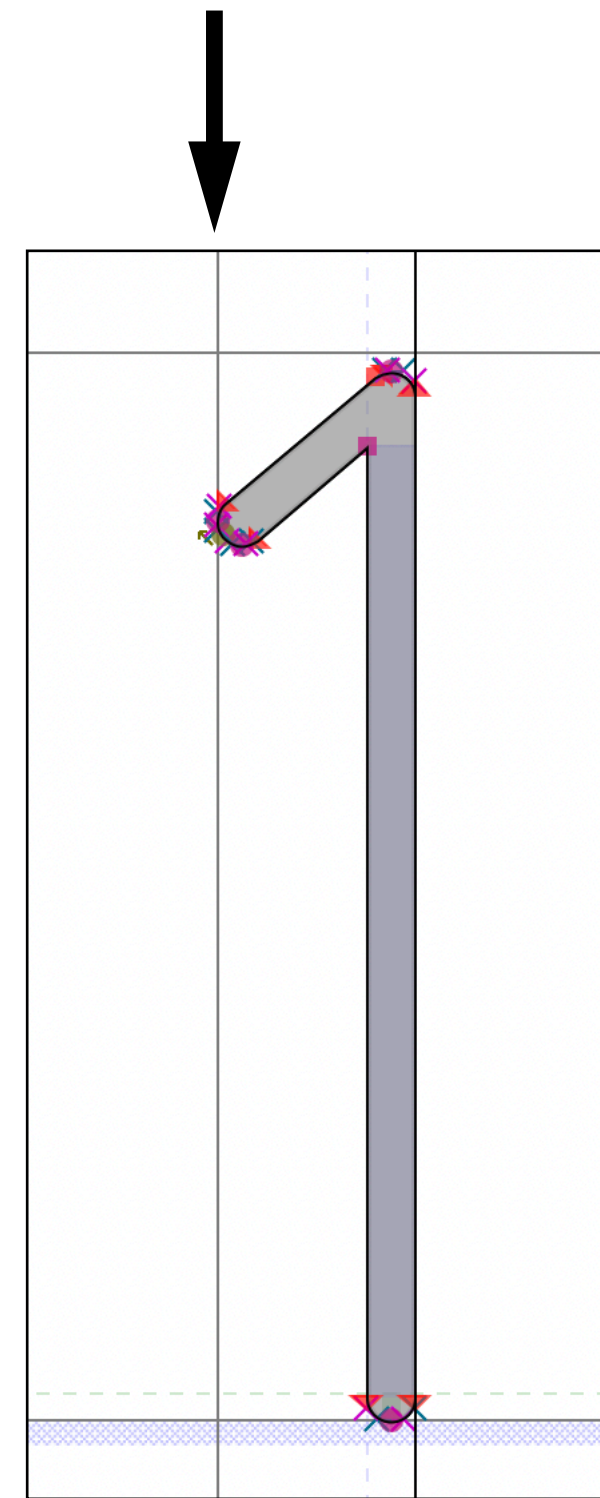
Open-source and community oriented
What should happen next for lute tablature?

- MEI Schema definition
  - Identify corner cases in music sources … and make compromises in the model
  - MEI is not meant to represent visually exactly every source in the world
- Verovio implementation
  - Coding, coding and coding …
  - Prepare test examples and track changes
- Font developments
  - Submit proposals for modifications or additions to SMuFL based on example sources
  - Design fonts and font subsets – or make existing fonts SMuFL compliant
- Gather datasets
- Built on all this!

Thank you

https://www.verovio.org/
https://rism.digital/

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