# Input formats

When data is loaded into Verovio with no input format specifies, it tries to detect it based on the initial content of the data. MEI is assume to be the default format if auto detection fails. In such cases, the format can be given explicitly with the option —input-from (or -f).

# MEI

The native input format for Verovio is MEI. Verovio supports MEI as input format from MEI 2013 onwards. From Verovio 2.x.x, the plan is to have even version numbers for Verovio releases using a stable version of MEI, and odd version numbers for releases using a development version of MEI. It means that once MEI 5.0 will be released, Verovio will move to version 4.x.x. Older versions of MEI are still supported by newer versions of Verovio.

When loading MEI data into Verovio and outputting MEI, elements that are not supported by Verovio will be ignored. This means that they are not loaded into memory and will not be preserved in the MEI output. This includes the element themselves, but also any descendant they might have. A warning will be given in the console. For example:

```
[Warning] Unsupported '<ossia>' within <measure>
```

# Support for previous version of MEI

When an MEI file in loaded into Verovio and is not of the latest version for that version of Verovio, it performs upgrade steps for the features that were supported by Verovio for that older version of MEI.

#### MEI 2013 files

Various attributes in <page> and <measure> for the page-based version of MEI are upgraded (experimental work).

#### MEI 3.0 files

The following elements / attributes are upgraded:

- beatRpt
- fTrem@slash
- instrDef@midi.volume
- mordent@form
- turn@form
- staffDef@barthru
- staffDef@label
- staffDef@label.abbr
- staffGrp@label
- staffGrp@label.abbr
- @dur.ges

# Original data

# Upgraded data

XML

```
<beatRpt slash="1" />
<beatRpt slash="2" />
<beatRpt slash="2" />
<beatRpt slash="1" />
```

# Original data

```
xmL
<fTrem slash="2" />
```

# Upgraded data

```
XML
<fTrem beams="2" />
```

# Original data

```
xmL
<instrDef midi.volume="111" />
```

### Upgraded data

```
xmL
<instrDef midi.volume="87.40%" />
```

### Original data

```
xmL
<mordent form="inv" />
<mordent form="norm" />
```

### Upgraded data

```
xmL
<mordent form="upper" />
<mordent form="lower" />
```

# Original data

```
xmL
<turn form="inv" />
<turn form="norm" />
```

# Upgraded data

### Original data

```
xmL
<staff barthru="true" />
```

# Upgraded data

```
xmL
<staff bar.thru="true" />
```

### Original data

```
XML
```

```
<staffDef label="violin I" label.abbr="vl I" />
```

### Upgraded data

### Original data

```
xmL
<note dur.ges="8p" />
<note dur.ges="32r" />
<note dur.ges="32s" />
```

### Upgraded data

```
xmL
<note dur.ppq="8" />
<note dur.recip="32" />
<note dur.real="32" />
```

#### MEI 4.0 files

The following elements / attributes are upgraded:

- mensur@tempus
- mensur@prolatio

# Original data

```
xmL
<mensur tempus="3" />
<mensur tempus="2" />
```

# Upgraded data

```
xmL
<mensur tempus="3" sign="0" />
<mensur tempus="2" sign="C" />
```

### Original data

```
xmL
<mensur prolatio="3" />
<mensur prolatio="2" />
```

### Upgraded data

```
xmL
<mensur prolatio="3" dot="true" />
<mensur prolatio="2" dot="false" />
```

# Page-based MEI

The MEI page-based model is not part of MEI. It was put in place for the development of Verovio and can still change in the future. It will be documented as input format once it is stabilized.

# Humdrum

Humdrum data is an analytic music code for transcribing fully polyphonic textures. Humdrum syntax presents notes of the score in strict time sequence. Each data row represents all notes sounding or events occurring at the same time, and each column traces the melodic line of the individual parts. More information about the syntax is available on the <u>Humdrum</u> website.

### **Examples**

The following example from Mozart's piano sonata in F major, K1 280 (K6 189e), mvmt. 1, is generated dynamically within this page using the JavaScript form of Verovio, inputting the Humdrum data that follows.

# Piano Sonata No. 2 in F major



The data consists of three separate streams of information, called spines that usually consist of one column, but sometime more due to spine splits into subspines. The first column represents music on the bottom staff, the second column represents the top staff, and the third column contains the dynamics, which in this case apply to both staves.

```
!!!COM: Mozart, Wolfgang Amadeus
!!!OTL: Piano Sonata No. 2 in F major
!!!OMV: 1
!!!SCT1: K1 280
!!!SCT2: K6 189e
!!!OMD: Allegro assai
**kern **kern **dynam
*staff2 *staff1 *staff1/2
*clefF4 *clefG2 *
*k[b-] *k[b-] *
*F:
        *F:
        *M3/4
*M3/4
*MM152 *MM152 *
=1-
        =1-
                =1-
4FF 4F
        4c: 4f: 4a: 4cc:
                                 f
4C
        4a/ 4cc/
        4a/ 4cc/
4AA
=2
        =2
                =2
4FF
        4.a/ 4.cc/
4FFF
        (16ddLL .
        16ccJJ
4r
        16b-LL
        16a
        16g
        16fJJ
        =3
=3
                =3
8F 8AL
       4ff
8F 8A
8F 8G 8B-
                4ee
8F 8G 8B-
8F 8A 8c
                4ee-)
8F 8A 8cJ
                =4
8F 8B- 8dL
                4dd
8F 8B- 8d
8F 8B- 8d
                4r
8F 8B- 8d
8F 8B- 8d
                4r
8F 8B- 8dJ
=5
        =5
                =5
8F 8G 8eL
                (8ccL
8F 8G 8e
                8b-J)
8F 8G 8e
                4b-'
8F 8G 8e
8F 8G 8e
                4r
8F 8G 8eJ
=6
                =6
        =6
```

### Verovio Humdrum Viewer

The <u>Verovio Humdrum Viewer</u> (VHV) is a special-purpose interactive website for viewing and editing Humdrum files with the Verovio notation egraving library. You can view the full score for the above Mozart example in VHV from this link: <u>verovio.humdrum.org/?</u> <u>file=mozart/sonata92-1.krn</u>.

When on a VHV notation page, try pressing the key "**p**" to view the scan of the original print from which the musical data was encoded. Also try pressing "**m**" to view the internal conversion to MEI data. Vi users can try pressing "**v**" to toggle between the basic and vim modes for the text editor. Use the left/right arrow keys or PageUp/PageDown to navigate to different pages. Press shift-left/right arrows to go to the next/previous work/movement in the repertory.

Sample repertories of Humdrum data displayed in the Verovio Humdrum Viewer:

• J.S. Bach chorales (When viewing a chorale, type the "o" letter key to toggle view of the original historic clefs.)

- · Mozart piano sonatas
- · Beethoven piano sontats
- · Beethoven string quartets
- · Chopin mazurkas
- · Works of Scott Joplin
- · Works of Josquin des Prez
- · Works of Johannes Ockeghem
- Works of Pierre de la Rue
- · Works of Mabrianus de Orto
- Deutscher Liederschatz, Band I (Edited by Ludwig Erk.)

# Command-line interface usage

To typeset music in the Humdrum format on the command-line:

#### TERMINAL

\$ verovio -f humdrum input.krn -o output.svg

You can usually use the auto-detection feature of verovio by omitting the option.

#### TERMINAL

\$ verovio input.krn -o output.svg

The output filename will have the same basename as the input if the option is not given, so in this case the output will be called .

#### TERMINAL

\$ verovio file.krn

Standard input/output can be used with the verovio command by giving a dash for standard input and to send the output to standard output.

#### TERMINAL

\$ cat input.krn | verovio - -o - > output.svg

To convert to MEI data:

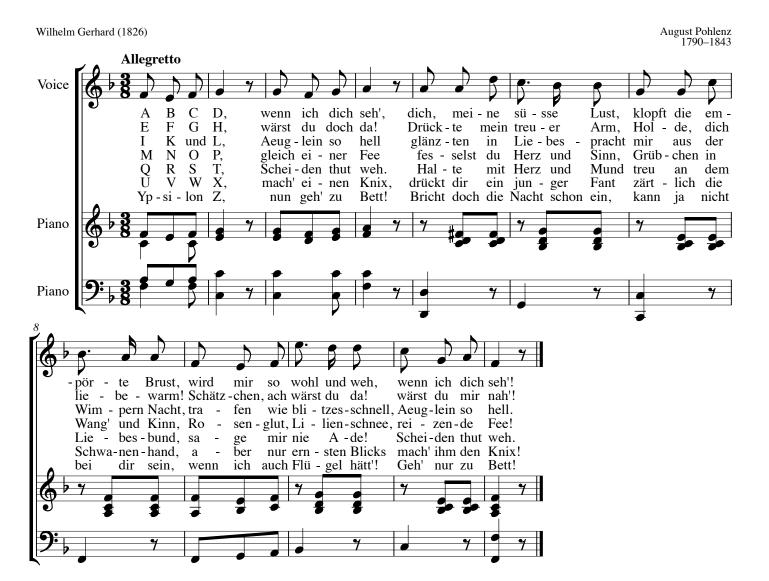
#### TERMINAL

\$ verovio file.krn --no-layout --all-pages -t mei

# A more complicated example

Below is a song for voice and piano accompaniment. Each verse is listed in a separate spine of \*\*text in addition to the three staves of music in \*\*kern spines and one dynamics (\*\*dynam) spine.

Liebes-A-B-C



```
!!!OTL@@DE: Liebes-A-B-C
!!!COM: Pohlenz, August
!!!CDT: 1790/07/03/-1843/03/09/
!!!ODT: 1827
!!!OMD: Allegretto
!!!LYR: Gerhard, Wilhelm
!!!LDT: 1826
!!!OCL: Erk, Ludwig
!!!GCO: Deutscher Liederschatz, Band 1
**kern **kern **kern **text **text **text **text **text
*staff3 *staff2 *staff1 *staff1 *staff1 *staff1 *staff1 *staff1 *staff1
*Ipiano *Ipiano *Ivox
*clefF4 *clefG2 *clefG2 *
                                                              *
                                                                                *
*k[b-]
        *k[b-]
                 *k[b-]
                                   *
                                                     *
                                                              *
                                                                       *
                                                                                *
*F:
         *F:
                 *F:
                                   *
                                                     *
                                                              *
                                                                                *
*M3/8
         *M3/8
                 *M3/8
                                                              *
                                                                                *
*MM100
        *MM100
                 *MM100
                          *
                                   *
                                                     *
                                                              *
                                                                       *
                                                                                *
=1-
         =1-
                 =1-
                          =1-
                                   =1-
                                            =1-
                                                     =1-
                                                              =1-
                                                                       =1-
                                                                                =1-
*^
         *^
                 *
                                   *
                                            *
                                                     *
                                                              *
                                                                                *
                          *
                                                                       *
                                                     Ε
                                                                       М
         4F
                 8fL
                                   8f
                                                              Ι
                                                                                Q
                                                                                         U
                                                                                                  Yp-
8AL
                          4c
                                            Α
8G
                 8e
                                   8e
                                            В
                                                     F
                                                              Κ
                                                                       N
                                                                                R
                                                                                                  -si-
8AJ
         8F
                 8fJ
                          8c
                                   8f
                                            C
                                                     G
                                                                       0
                                                                                S
                                                                                         W
                                                                                                  -lon
                                                              und
*v
         *v
                 *
                          *
                                   *
                                            *
                                                     *
                                                              *
                                                                       *
                                                                                *
                                                                                                  *
*
         *v
                 *v
                          *
                                   *
                                                     *
                                                              *
                                                                       *
                                                                                *
=2
         =2
                 =2
                          =2
                                   =2
                                            =2
                                                     =2
                                                              =2
                                                                       =2
                                                                                =2
4C 4c
         4e 4g
                 4g
                          D,
                                   Η,
                                                     Ρ,
                                                              Τ,
                                                                       Χ,
                                                                                Ζ,
                                            L,
8r
         8r
                 8r
=3
                          =3
                                   =3
                                            =3
                                                     =3
                                                              =3
                                                                       =3
                                                                                =3
         =3
                 =3
                                                              Schei-
4C 4c
         8e 8gL
                 8g
                          wenn
                                   wärst
                                            Aeug-
                                                     gleich
                                                                       mach'
                                                                                nun
         8d 8f
                 8f
                                   du
                                                              -den
                                                                                geh'
                          ich
                                            -lein
                                                     ei-
                                                                       ei-
8C 8c
         8e 8gJ
                 8g
                          dich
                                   doch
                                                              thut
                                                                       -nen
                                                                                zu
                                            S0
                                                     -ner
=4
        =4
                 =4
                          =4
                                   =4
                                            =4
                                                     =4
                                                              =4
                                                                       =4
                                                                                =4
4F 4c
         4f 4a
                 4a
                          seh',
                                   da!
                                            hell
                                                     Fee
                                                              weh.
                                                                       Knix,
                                                                                Bett!
8r
         8r
                 8r
         =5
                 =5
                                   =5
                                            =5
                                                     =5
                                                              =5
                                                                                =5
=5
                          =5
                                                                       =5
4DD 4D
        8r
                 8a
                          dich,
                                   Drück-
                                            glänz-
                                                     fes-
                                                              Hal-
                                                                       drückt
                                                                                Bricht
         8c 8d 8f#L
                          8a
                                   mei-
                                            -te
                                                     -ten
                                                              -selst
                                                                       -te
                                                                                dir
                                                                                         doch
         8c 8d 8f#J
8r
                          8dd
                                            mein
                                                     in
                                                              du
                                                                       mit
                                                                                ein
                                                                                         die
                                   -ne
=6
         =6
                          =6
                                   =6
                                            =6
                                                     =6
                                                              =6
                                                                       =6
                                                                                =6
                 =6
4GG
         8r
                 8.cc
                          sü-
                                                                                Nacht
                                   treu-
                                            Lie-
                                                     Herz
                                                              Herz
                                                                       jun-
         8B- 8d 8gL
                 16b-
                          -sse
                                   -er
                                            -bes-
                                                     und
                                                              und
                                                                       -ger
                                                                                schon
8r
         8B- 8d 8gJ
                          8b-
                                                     -pracht Sinn,
                                                                                Fant
                                   Lust,
                                            Arm,
                                                                       Mund
                                                                                         ein,
=7
         =7
                          =7
                 =7
                                   =7
                                            =7
                                                     =7
                                                              =7
                                                                       =7
                                                                                =7
4CC 4C
                                   Hol-
                                                     Grüb-
        8r
                 8g
                          klopft
                                            mir
                                                              treu
                                                                       zärt-
                                                                                kann
         8B- 8c 8eL
                          8g
                                   die
                                            -de,
                                                     aus
                                                              -chen
                                                                       an
                                                                                -lich
                                                                                         ja
8r
         8B- 8c 8eJ
                          8cc
                                   em-
                                            dich
                                                     der
                                                              in
                                                                       dem
                                                                                die
                                                                                         nicht
        =8
                          =8
                                   =8
                                            =8
                                                     =8
                                                                       =8
                                                                                =8
=8
                 =8
                                                              =8
4FF
         8r
                 8.b-
                          -pör-
                                   lie-
                                            Wim-
                                                     Wang'
                                                              Lie-
                                                                       Schwa-
                                                                                bei
         8A 8c 8fL
                 16a
                          -te
                                   -be-
                                            -pern
                                                     und
                                                              -bes-
                                                                       -nen-
                                                                                dir
8r
         8A 8c 8fJ
                          8a
                                   Brust,
                                            warm!
                                                     Nacht,
                                                              Kinn,
                                                                       -bund,
                                                                                -hand,
                                                                                         sein,
         =9
                          =9
                                   =9
                                            =9
                                                     =9
                                                                                =9
=9
                 =9
                                                              =9
                                                                       =9
8FFL
         8A 8fL
                 8f
                          wird
                                   Schätz- tra-
                                                     Ro-
                                                                                wenn
                                                              sa-
                                                                       a-
                 8e
8GG
         8B- 8e
                                   -chen,
                                            -fen
                                                                                ich
                          mir
                                                     -sen-
                                                              -ge
                                                                       -ber
8AAJ
         8c 8fJ
                 8f
                          S0
                                   ach
                                            wie
                                                     -glut,
                                                              mir
                                                                       nur
                                                                                auch
=10
        =10
                 =10
                          =10
                                   =10
                                            =10
                                                     =10
                                                              =10
                                                                       =10
                                                                                =10
4BB-
         8r
                 8.ee
                          wohl
                                   wärst
                                            bli-
                                                     Li-
                                                                                Flü-
                                                              nie
                                                                       ern-
         8B- 8d 8gL
                 16dd
                          und
                                   du
                                            -tzes-
                                                     -lien- A-
                                                                       -sten
                                                                                -gel
8r
         8B- 8d 8gJ
                          8dd
                                   weh,
                                            da!
                                                     -schnell,
                                                                                         Blicks hätt'!
                                                                       schnee,
                                                                                de!
                          =11
                                            =11
                                                     =11
=11
         =11
                 =11
                                   =11
                                                              =11
                                                                       =11
                                                                                =11
```

```
4C
                                                             Schei-
                                                                              Geh
        8r
                 8cc
                          wenn
                                   wärst
                                           Aeug-
                                                    rei-
                                                                      mach'
        8B- 8c 8eL
                          8g
                                   ich
                                           du
                                                    -lein
                                                             -zen-
                                                                      -den
                                                                              ihm
                                                                                       nur
        8B- 8c 8eJ
8r
                          8a
                                   dich
                                           mir
                                                             -de
                                                                      thut
                                                                              den
                                                    S0
                                                                                       zu
        =12
                          =12
                                   =12
                                                             =12
                                                                      =12
                                                                              =12
=12
                 =12
                                           =12
                                                    =12
4FF 4F
        4A 4c 4f
                          4f
                                                    hell.
                                   seh'!
                                           nah'!
                                                             Fee!
                                                                      weh.
                                                                              Knix!
                                                                                       Bett!
8r
        8r
                 8r
                 *-
                          *-
                                   *-
                                                    *-
                                                                      *-
!!!SMS: Deutscher Liederschatz, Band 1, Ludwig Erk, ed.
!!!ENC: Craig Stuart Sapp
!!!END: 2004/05/16/
!!!EED: 2011/02/05/
!!!EFL: 001/651
!!muse2ps: s^(.){(..)}^z21jv200,114,144
!!CharacterEncoding: UTF-8
```

# Additional input format via Humdrum

Verovio with Humdrum enabled supports some additional input formats that can be used with --input-from:

- MuseData with option md, musedata, or musedata-hum
- EsAC with esac

For more information about these input formats, see the Verovio Humdrum Viewer documentation.

# MusicXML

Verovio has two converters for importing MusicXML data. The first one directly converts MusicXML into MEI. The second one first converts to Humdrum and then converts the Humdrum to MEI. By default, the first importer is used. It is also the one triggered when the value xml is passed to the --input-from option.

# Compressed MusicXML files

Verovio supports MusicXML compressed (MXL) files. It only loads basic single-file MusicXML MXL files containing the index file (META-INF/container.xml) and the MusicXML file, with the extension .xml. The input process searches for the META-INF/container.xml file from which the filename of the MusicXML file is extracted. The filename extracted is the first ./rootfile@full-path listed in /container/rootfiles.

Input of MXL files is auto detected and the xml value does not have to be passed to --input-format. However, when using the JavaScript toolkit, you need to make sure your data is an ArrayBuffer or a base64 string, and use loadZipDataBuffer() or loadZipDataBase64() respectively to load it instead loadData(). Here is an example using the JavaScript Fetch API, loading the file as an ArrayBuffer:

# Importing MusicXML via Humdrum

The MusicXML import via Humdrum is available only for Verovio builds where Humdrum support has been enabled specifically at build time. For the JavaScript toolkit, this is not the default and it is important to make sure that the appropriate build is being used. See the related <u>section</u> for more information about this. With the command-line tool and the Python toolkit, Humdrum support is enabled by default.

With Verovio builds that support Humdrum, the MusicXML import via Humdrum can be triggered by setting the --input-from option to musicxml-hum. For example:

```
TERMINAL

verovio -f musicxml-hum -t hum file.xml
```

The MusicXML import via Humdrum can itself be made the default MusicXML importer with the build option MUSICXML\_DEFAULT\_HUMDRUM. See the <u>command-line</u> section for more information on how to change build options. With this, MusicXML files will be loaded via the Humdrum importer without having to specify musicxml-hum for the option --input-from. The direct importer can still be used by passing the value xml to --input-from.

# Plaine and Easie

The Plaine & Easie Code is a library standard that enables entering music incipits in modern or mensural notation. It is mostly used by the <u>Répertoire International des Sources Musicales</u> (RISM) for inventorying the music incipits of the manuscripts. More information about the syntax is available on the <u>IAML</u> website.

Plaine and Easie input in Verovio is a text file (or string) with a list of the following @key:value lines:

- @clef the initial clef
- @keysig the initial key signature
- @timesig the initial time signature
- @data the incipit content

From version 3.7, the content can be structured as a JSON object with a clef, keysig, timesig and data key. Verovio will auto detect both as Plaine & Easie format. Internally, text files with @key:value lines are converted into a JSON object.

The structure of this input format is not part of the PAE specification but only a convention put in place for Verovio

# **Examples**

#### Beams and tuplets

Text file input

```
@clef:G-2
@keysig:xFCGD
@timesig:3/8
@data:'6B/{8B+(6B''E'B)}({AFD})/{6.E3G},8B-/({6'EGF})({FAG})({GEB})/4F6-
```

# JSON input

```
JSON
{
    "clef": "G-2",
    "keysig": "xFCGD",
    "timesig": "3/8",
    "data": "'6B/{8B+(6B''E'B)}({AFD})/{6.E3G},8B-/({6'EGF})({FAG})({GEB})/4F6-"
}
```



### Measure rests and key and time signature changes

```
@clef:G-2
@keysig:xF
@timesig:3/8
@data:=25//=5//$xFCG @c 2-4.-'8E/{6AGFE}{8A''C}'B''4D{6C'B}/{''DC'BA}{''8EA}
```



#### Clef changes

@clef:F-4
@keysig:bB
@timesig:c
@data:,6{FA'CF}%G-2 {''6CEA'''C}%F-4 {,6FB'DF}%G-2 {''6DFA'''D}/



#### **Trills and fermata**

@clef:C-4
@keysig:xFC
@timesig:c/
@data:,{8.A6A}/'4.Dt8D4.Ct8D/{8.E6C},8(A)'E4DtE/{8.Ft3GE}8(D)-2-/



### Ties

@clef:G-2
@keysig:xFCG
@timesig:3/8
@data:''8-{CD+}/{DC'B}/{xAB''F+}/{FED}/{CGB+}/{BAG+}/{GFE}/



# Grace notes (acciaccaturas)

@clef:G-2
@keysig:bBE
@timesig:2/4
@data:''{8.F6D'8B}6-''F/{8.F6E8C}6-E/{8DC}{'8B''gC'gBgAgB''6FE}/2D



### Grace notes (appoggiaturas)

```
@clef:F-4
@keysig:xF
@timesig:c
@data:qq,3{DnF'D}r/2Fqq,3{DnF'D}r2Aqq3,{DF'D}r/1bB,qq3{EG'C}r/1A//
```



#### Rhythmic patterns



#### **Abbreviated writing**

```
@clef:G-2
@keysig:
@timesig:3/4
@data:'6!{GGCC}/i/i/
```



# **PAE Validation**

The toolkit can be used to validate Plaine & Easie input data with the ValidatePAE or ValidatePAEFile methods. The methods load the PAE data passed as a string or from a file respectively. They both return a stringified JSON object with validation error or warning messages.

The JSON object can contain one or more validation messages. When a global input error is encountered (e.g., data is missing in the input), a single object is returned. Otherwise, the object is structured with keys corresponding to the JSON input keys (clef, keysig, timesig and data). Each key can have one single validation message, except for data that contains an array of one or more messages. Only keys for which a validation message is given will exist in the validation object. In non-pendantic mode, syntax problems are marked as warning as long as parsing can continue.

Each validation message is structured as follow:

```
JSON
{
  "column": 0,
  "row": 0,
  "code": 1,
  "text": "A description of the validation problem",
  "type": "error"
}
```

Description of the values:

- The column indicates the position where the problem occurs in the input string. It is always 0 for clef, keysig and timesig. It can be -1 in data when no position can be indicated.
- The row is always 0.
- The type can be error or warning.
- The code corresponds to a numeric error code that can be used to map the errors into another system and (for example) to translate the messages.

Whenever the error message contains a string interpolation %s, then the json message also contains a value key with the value to be used for the interpolation.

Here is an example of invalid input data and the object returned by the validation call:

```
JSON
{
    "clef": "GG2",
    "keysig": "bB",
    "data": "=1/4-''DC'tB/''tCC"
}
JSON
{
  "clef": {
    "column": 0,
    "row": 0,
    "code": 43,
    "text": "Unexpected second character in clef sign",
    "type": "warning"
  },
  "data": [
    {
      "column": 10,
      "row": 0,
      "code": 17,
      "text": "Invalid t not after a note",
       "type": "warning"
    },
      "column": 15,
      "row": 0,
      "code": 17,
      "text": "Invalid t not after a note",
       "type": "warning"
    }
  ]
}
```

# **ABC**

Abc is a text-based music notation system originally designed for use with folk and traditional tunes and used throughout the web. You can find the documentation on the <u>ABC notation</u> website.

# **Examples**

Let's start with a simple little tune.

```
X: 99
T:Short tune
C:K. Rettinghaus
M:4/4
L:1/4
K:G
D|G>ABG|A>BAD|G>ABA|G3|]
```

### Short tune

K. Rettinghaus



Verovio takes several information fields into account, e.g. the reference number  $\, X \,$ , the tune title  $\, T \,$ , the meter  $\, M \,$ , the unit note length  $\, L \,$ , the key  $\, K \,$ . As you can see, Verovio prints the header as expected by default. You may suppress this behaviour with the  $\, --$  header none option.

Now let's add a literal tempo as well as some grace notes and chord symbols. Dynamics are also very important! Note that chord symbols are put above the melody.

```
X: 99
T:Short tune
C:K. Rettinghaus
M:4/4
L:1/4
Q:"Andante"
K:G
"D"!mf!D|"G"G>A "Em"B {/A/}G|"Am"A>B "D7"A{/E/}D|"G"G>A "C"B "D"A|"G"G3|]
```

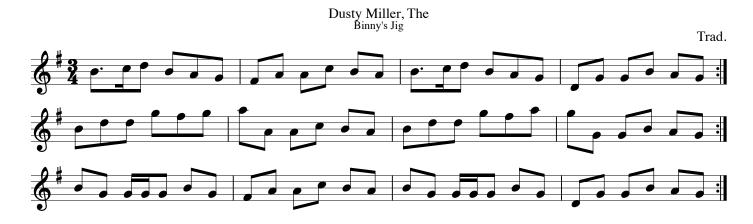
### Short tune

K. Rettinghaus



With the option --breaks: 'encoded' Verovio keeps the encoded layout, as you can see on this page. The default value is 'auto', which lets Verovio to decide where to put a line-break.

```
X:1
T:Dusty Miller, The
T:Binny's Jig
C:Trad.
R:DH
M:3/4
K:G
B>cd BAG|FA Ac BA|B>cd BAG|DG GB AG:|
Bdd gfg|aA Ac BA|Bdd gfa|gG GB AG:|
BG G/2G/2G BG|FA Ac BA|BG G/2G/2G BG|DG GB AG:|
```



Alternatively it is always possible to suppress score line-breaks. Meter changes are also supported.

X:2 T:Old Sir Simon the King C:Trad. S:Offord MSS % from Offord manuscript % reference note N:see also Playford M:9/8R:SJ % slip jig N:originally in C % transcription note K:G D|GFG GAG G2D|GFG GAG F2D|EFE EFE EFG|A2G F2E D2:| D|GAG GAB d2D|GAG GAB c2D|[1 EFE EFG EFG|A2G F2E D2:|\\\ % no line-break in score M:12/8 % change of meter [2 E2E EFE E2E EFG|\\\ % no line-break in score M:9/8% change of meter A2G F2E D2|]



# **Broken rhythm markers**

X:1
T:Broken rhythm markers
M:C
K:C
A>A A2>A2 A>>A A2>>>A2|]



# Ties and slurs

Verovio correctly differentiates between ties and slurs.

```
X:1
T:Ties and Slurs
M:C
K:C
(AA) (A(A)A) ((AA)A) (A|A) A-A A-A-A A2-|A4|]
```



### **Accidentals**

```
X:1
T:Accidentals
M:C
K:C
__A _A =A ^A ^^A|]
```



# Chords

```
X:1
T:Chords
M:2/4
K:C
[CEGc] [C2G2] [CE][DF]|[D2F2][EG][FA] [A4d4]|]
```



# **Known limitations:**

- · Tuplets are not supported
- · User defined symbols are not supported
- Multi-voice music is not supported

# **CMME**

The CMME format is an XML-based format developped for the <u>Computerized Mensural Music Editing</u> project. It can be imported into Verovio as of version 4.4. CMME files can be imported with -f cmme.xml but are also auto-detected.

A CMME file is imported as an MEI mensural file with one single mdiv/score. Sections in CMME are imported as distinct section elements within the score.

Everything in imported as mensural notation, including sections marked as Plainchant in CMME since there is no difference in the way the music is encoded in those sections. Where there is less voices in a section than in the rest of the score, empty and invisible staff elements <staff visibility="false"/> are added to the section.

The initial staffDef elements have no @clef.\* and no @keyisg and these are given in the layer instead. Every staffDef contains a mensur indicating that all level of divisions are binary by default.

#### MEI header

The GeneralData element of the CMME file is used to populate the MEI header. It uses:

- The Title as title
- The Section as title@type="subordinate"
- The Composer as composer

#### **Durations**

The CMME import forces the use of the --duration-equivalence option to minima when importing a CMME file. A warning is shown if the option was previously different - which is the case by default. This could potentially have side effects for subsequent calls since it is not set back to its original value.

### **Proportions**

Proportions in CMME can be encoded as Proportion element, or as TempoChange within Mensuration. Encoding a proportion as a tempo change is arguably not the proper way to do it, but as a matter of fact, it is a used practice the importer needs to deal with. The importer tries to disentangle proportions and tempo changes. One complication is that proportions and tempo changes in CMME act differently. Proportions are cumulated with the previous ones, whereas tempo changes are not.

Ideally proportions encoded in a mensur indications that are actual tempo changes should be ignored in the conversion because they do not represent a proportion in the notation. Furthermore, when converting the imported data to CMN, this will yield measure content that hardly makes sense since tuplets will be used to represent the proportions. However, when a proportion encoded in a mensur indication is a real proportion, it must be taken into account and preserved.

The importer ignores, if possible, the proportions inserted in the mensuration signs indicating a tempo change. This is done on the basis of the presence of an identical proportion for all voices. When tempo change proportions are occurring at all voices and with an identical Num and Den, they are preserved as an MEI proportion with a @type="cmme\_tempo\_change". Verovio ignores when performing that alignment of the data, including when converting to CMN.

When the proportion is not identical in all voices, it has to be preserved and taken into account for the alignment of the data. We can here distinguish two cases. The first is when the tempo change does not occur in all voices. In this case, it quite likely corresponds to a true proportion. It is preserved as an MEI proportion but with a @type="reset" to indicate that it should not be cumulated with a previous one - which is the default behavior of Verovio.

The second case is where all voices have a proportion, but it differs. In this case, there is no straightforward way of knowing which proportion is a tempo change, and which is a mixture of the two. The conversion will maintained an MEI proportion with <code>@type="reset"</code> at all voices. Even though the conversion result will be properly aligned in mensural MEI, it will yield a combination of corresponding tuplets when converted into CMN that will not be fully satisfactory. The best thing to do would be to correct the CMME files and to remove the tempo changes, or to separate the proportions and the tempo changes.

Finally, a CMME Proportion will converted to MEI proportion with no @type, impliying that the proportion has to be cumulated with a previous one.

### Coloration and color change

Coloration in CMME is encoded with Colored on Note, and is converted to MEI @colored .

The CMME ColorChange (i.e., the change of the color of the ink) is converted by applying the color (non-black) to note@color and rest@color. The possible colors are black (assumed to be the default and not encoded), red, yellow, green or blue.