

The `musicography` Package: Symbols for Music Writing with `pdf \LaTeX`

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Most \LaTeX font packages and freely available fonts only provided a limited range of musical symbols. The `lilyglyphs` package uses Lilypond’s fonts, but requires `lualatex`. This package makes available the most commonly used symbols in writing about music in a way that looks consistent and attractive. It is especially useful for `pdf \LaTeX` but also works alongside Unicode fonts with `xelatex`. It includes accidentals, meters, notes of different rhythmic values, and automatic formatting of figured bass.

This package builds on the approach used in the `harmony` package, where the symbols are taken from the MusiXTeX fonts. But it provides a larger range of symbols and a more flexible, user-friendly interface written using `xparse`. The package is meant to work hand-in-hand with my `semantic-markup` package, and overrides some of its music-symbol commands with better alternatives.

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1 Package Options

To use the package, write `\usepackage{musicography}` in your preamble. If you are also using this author’s `semantic-markup` package, `musicography` will automatically redefine the commands for accidentals in the other package.

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The `bigger` option provides larger font sizes that match better with certain fonts.

The package now (2019) provides full support for figured-bass notation using the `\musFig` command.

The `\musNumFont` command allows you to change the font of the numerals used. For example, if using the `ebgaramond` font package, it looks better if you do this:

```
\renewcommand{\musNumFont}[1]{\liningnums{#1}}.
```

2 Symbols and Commands

2.1 Accidentals

Flat	<code>\musFlat</code> or <code>\fl</code>	b
Sharp	<code>\musSharp</code> or <code>\sh</code>	#
Natural	<code>\musNatural</code> or <code>\na</code>	♮
Double Flat	<code>\musDoubleFlat</code>	♭♭
Double Sharp	<code>\musDoubleSharp</code>	×

2.2 Notes of Different Rhythmic Values

Commands are available using modern (United States) note names; in several cases there are also aliases for older note names.

Whole note (semibreve)	<code>\musWhole</code> or <code>\musSemibreve</code>	♩
Half note (minim)	<code>\musHalf</code> or <code>\musMinim</code>	♪
Quarter note (semiminim)	<code>\musQuarter</code> or <code>\musSeminimin</code>	♩
Eighth note (corchea)	<code>\musEighth</code> or <code>\musCorchea</code>	♪
Sixteenth note	<code>\musSixteenth</code>	♩
Thirty-second note	<code>\musThirtySecond</code>	♩
Sixty-fourth note	<code>\musSixtyFourth</code>	♩

A dot may be added to any of the above by adding `Dotted` to the end of the command. For example:

Dotted whole note	<code>\musWholeDotted</code>	♩.
Dotted quarter note	<code>\musQuarterDotted</code>	♪.
Dotted thirty-second note	<code>\musThirtySecondDotted</code>	♩.

2.3 Meter Signatures

Common duple	<code>\meterC</code>	C
<i>Alla breve</i>	<code>\meterCutC</code>	Ⓒ
Ternary (16th–18th cent.)	<code>\meterCThree</code>	C3
Ternary with 3 : 2 proportion	<code>\meterCThreeTwo</code>	C $\frac{3}{2}$
Spanish 17th-cent. ternary	<code>\meterCZ</code>	CZ
Medieval <i>tempus perfectum</i>	<code>\meterO</code>	○

For other time signatures, use `\musMeter{ }{ }`; the two arguments are the numerator and denominator of the fraction, respectively.

2.4 Figured Bass

For figured-bass notation, use `\musFig{}`. The command, as of May 2019 now re-implemented using the `stackengine` package, takes a single argument which may contain as many space-separated elements as you like. (The `\musFig` command is implemented with `\musStack{}`, which is also used to for `\musMeter`.)

The elements in the argument will be stacked vertically and left-aligned. Multiple figures in a row should be enclosed in brackets if there are spaces between them.

To align figures when there are empty slots, as in $6\text{--}5\sharp$, use `\noFig[]`. It will insert horizontal space the same width as its optional argument when typeset; the default value is the width of the numeral 5. It does this using `\hphantom`, so you should supply the same text in the argument as the figure with which you want to align. The code for the example at the beginning of this paragraph was `\musFig{6--5 \noFig[5--]\musSharp}`.

The font may be controlled by redefining `\musFigFont{}`. Its default value is as follows:

```
\NewDocumentCommand{\musFigFont}{}{%
  \scriptsize
  \let\musFontLarge\musFontBig
}
```

This reduces the size of numbers and the music font so that they fit better with surrounding text and so that numerals and accidentals in the figures match.

Two figures	<code>\musFig{7 5\musSharp}</code>	$7\sharp$
Three figures	<code>\musFig{7\musFlat{} 5 3}</code>	$7\flat$ 5 3
Four figures	<code>\musFig{7 5 4 2}</code>	9 7 3
Voice leading	<code>\musFig{7--6 5--4 3}</code>	$7\text{--}6$ $5\text{--}4$ 3
Voice leading	<code>\musFig{6--7 4--5 \noFig[2--]3}</code>	$7\text{--}6$ $5\text{--}4$ 3
Multiple figures per row	<code>\musFig{{6\musFlat{} 5} {\noFig[6\musFlat] \musSharp}}</code>	$6\flat 5\sharp$

2.5 Customization

It would be a simple matter of using `\newcommand` or `\let` to create aliases for these commands, say, for British usage (such as `\quaver`).

L^AT_EX programmers may wish to use the package's internal commands directly to access more symbols from the fonts or fine-tune their appearance. See `\musSymbol` and `\musAccidental` in the code listing below.

3 Changes

2020-01-29 Reduced stack gap for `\musFig`

2019/11/24 Fix `\MeterCThreeTwo` so that numbers are stacked and aligned correctly

2019/05/28 Bux fixes and new features, especially figured bass

- Fix issue 1 on Bitbucket, thanks to Christian Mondrup
 - * Correct mistaken notehead symbol for values less than quarter note (was hollow, now filled)
 - * Add 32nd and 64th notes, regular and dotted varieties
 - * `\musSymbol` is now typeset inside an `\mbox` to fix alignment problems when used in tables
- New features (some requested in issue no. 1):
 - * Add medieval perfect meter
 - * Add aliases for *fusa* (= corchea = eighth note)
 - * Replace `musStack` implementation with `stackengine`
 - * Add full figured-bass support

2018/05/21 Override semantic-markup's `\fl`, `\sh`, `\na` commands if it is loaded

2017/10/31 Corrected glyph used for `\musHalf` and documented `\musMeter` and `\musFigures`

2017/08/29 First version on CTAN

2017/04/12 Created

4 Code

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{musicography}[2020/01/29
  Symbols for music writing with pdflatex]

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% and version 1.3 or later is part of all distributions
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%
% This work has the LPPL maintenance status 'maintained'.
% The Current Maintainer of this work is Andrew A. Cashner.
```

```

% This work consists of the package file musicography.sty
% and the documentation file musicography.tex.

% CHANGE LOG
% 2020-01-29 - Reduced stack gap for \musFig
% 2019-11-24 - Fix problem with \MeterCThreeTwo where numerals were being
%             printed next to each other instead of stacked.
% 2019-05-28 - Fix issue #1:
%             + Correct notehead symbol for values < quarter note
%             (was hollow, should be filled)
%             + Add 32nd and 64th notes regular and dotted
%             + \musSymbol now inside an \mbox to fix alignment problems
% - New features (some requested in issue #1)
%             + Add medieval perfect meter
%             + Add aliases for fusa (= corchea = eighth note)
%             + Replace musStack implementation with stackengine:
%             Now takes any number of space-separated arguments to stack
%             numerals, allowing for full figured-bass notation
% 2018-05-21 Override semantic-markup's \fl, \sh, \na commands if it is loaded
% 2017-10-31 Corrected glyph for \musHalf and documented
%             \musMeter and \musFigures
% 2017-08-29 First version on CTAN
% 2017-04-12 Created

\newif\ifLargeFont
\LargeFontfalse
\DeclareOption{bigger}{\LargeFonttrue}
\ProcessOptions\relax

\RequirePackage{xparse}

\ifLargeFont
  \newfont{\musFont}{musix13}
  \newfont{\musFontBig}{musix16}
  \newfont{\musFontLarge}{musix20}
\else
  \newfont{\musFont}{musix11}
  \newfont{\musFontBig}{musix13}
  \newfont{\musFontLarge}{musix16}
\fi

% Font for numbers in \musStack
% Could redefine to use lining figures, math mode, sans-serif, etc.
% Example for ebgarmond: \renewcommand{\musNumFont}[1]{\liningnums{#1}}
\NewDocumentCommand{\musNumFont}{}{}

```

```

% Print a music symbol from the \musFont, specifying space before, after, and
% baseline adjustment
% #1 optional font command (default: \musFont)
% #2 kern before
% #3 raisebox value
% #4 kern after
% #5 symbol code (e.g., \symbol{4})
\NewDocumentCommand{\musSymbol}{ 0{\musFont} m m m m }{%
  \mbox{#1\kern#2\raisebox{#3}{#5}\kern#4}}%
}

% Accidentals
% #1 symbol command for accidental
\NewDocumentCommand{\musAccidental}{ m }{%
  \musSymbol[\musFontLarge]{0.1em}{0.5ex}{-0.1pt}{#1}}%
}
\NewDocumentCommand{\musFlat}      {}{\musAccidental{\symbol{90}}}
\NewDocumentCommand{\musDoubleFlat}{ }{\musAccidental{\symbol{91}}}
\NewDocumentCommand{\musSharp}     {}{\musAccidental{\symbol{92}}}
\NewDocumentCommand{\musDoubleSharp}{ }{\musAccidental{\symbol{93}}}
\NewDocumentCommand{\musNatural}   {}{\musAccidental{\symbol{94}}}

% Shorthand accidental commands
% These commands are defined differently in the semantic-markup package,
% so LaTeX will use musicography commands instead
\@ifpackageloaded{semantic-markup}{%
  \RenewDocumentCommand{\fl}{ }{\musFlat}
  \RenewDocumentCommand{\sh}{ }{\musSharp}
  \RenewDocumentCommand{\na}{ }{\musNatural}
}{%
  \NewDocumentCommand{\fl}{ }{\musFlat}
  \NewDocumentCommand{\sh}{ }{\musSharp}
  \NewDocumentCommand{\na}{ }{\musNatural}
}

% Print a composite music symbol of a notehead plus stem
% #1 Symbol musSymbol command for notehead
\NewDocumentCommand{\musStemmedNote}{ m }{%
  \musSymbol{0.05em}{0.5ex}{0.2em}{#1\musStem}}%
}

% Stemmed note plus flag
% #1 symbol command for base note
% #2 symbol command for flag
\NewDocumentCommand{\musFlaggedNote}{ m m }{%
  \musSymbol{0.05em}{0.5ex}{Opt}{#1\musStem}}%
  \musSymbol{Opt}{Opt}{0.9em}{#2}}%
}

```

```

}

% Note plus dot
% #1 \musSymbol command for note to be dotted
\NewDocumentCommand{\musDottedNote}{ m }{#1\musDot}

\NewDocumentCommand{\musStem}{-}{%
  \musSymbol{0.955em}{0.55ex}{0pt}{\symbol{16}}%
}
\NewDocumentCommand{\musSegno}{-}{%
  \musSymbol{0.55em}{-0.4ex}{1.5em}{\symbol{86}}%
}
\NewDocumentCommand{\musDot}{-}{%
  \musSymbol{-0.2em}{-0.5ex}{0.7em}{\symbol{24}}%
}

\NewDocumentCommand{\musWhole}{-}{%
  \musSymbol{0.05em}{0.5ex}{1.35em}{\symbol{9}}%
}
\NewDocumentCommand{\musHalf}{-}{%
  \musStemmedNote{\symbol{8}}%
}
\NewDocumentCommand{\musQuarter}{-}{%
  \musStemmedNote{\symbol{7}}%
}
\NewDocumentCommand{\musEighth}{-}{%
  \musFlaggedNote{\symbol{7}}{\symbol{40}}%
}
\NewDocumentCommand{\musSixteenth}{-}{%
  \musFlaggedNote{\symbol{7}}{\symbol{41}}%
}
\NewDocumentCommand{\musThirtySecond}{-}{%
  \musFlaggedNote{\symbol{7}}{\symbol{42}}%
}
\NewDocumentCommand{\musSixtyFourth}{-}{%
  \musFlaggedNote{\symbol{7}}{\symbol{43}}%
}

\NewDocumentCommand{\musWholeDotted}{-}{%
  \musDottedNote{\musWhole}%
}
\NewDocumentCommand{\musHalfDotted}{-}{%
  \musDottedNote{\musHalf}%
}
\NewDocumentCommand{\musQuarterDotted}{-}{%
  \musDottedNote{\musQuarter}%
}

```



```

}
\NewDocumentCommand{\noFig}{ 0{5} }{%
  \hphantom{#1}%
}

\NewDocumentCommand{\meterC}{-}{%
  \musSymbolMeter{\symbol{83}}%
}
\NewDocumentCommand{\meterCutC}{-}{%
  \musSymbolMeter{\symbol{82}}%
}
}
% Ternary meters used in 16th--18th c. music
\NewDocumentCommand{\meterCThree}{-}{%
  \meterCplus{\musNumFont{3}}%
}
}
\NewDocumentCommand{\meterCThreeTwo}{-}{%
  \meterCplus{{\footnotesize\stackanchor[1pt]{3}{2}}}%
}
}
% Ternary meter used in 17th-century Spanish music
\NewDocumentCommand{\meterCZ}{-}{%
  \meterCplus{Z}%
}
}
% Perfect meter in medieval music
\NewDocumentCommand{\meterO}{-}{%
  $\bigcirc$
}
}

% Aliases for older note names
\NewDocumentCommand{\musSemibreve}      {}{\musWhole}
\NewDocumentCommand{\musMinim}          {}{\musHalf}
\NewDocumentCommand{\musSemiminim}      {}{\musQuarter}
\NewDocumentCommand{\musCorchea}        {}{\musEighth}
\NewDocumentCommand{\musFusa}            {}{\musEighth}
\NewDocumentCommand{\musSemibreveDotted} {}{\musWholeDotted}
\NewDocumentCommand{\musMinimDotted}    {}{\musHalfDotted}
\NewDocumentCommand{\musSemiminimDotted} {}{\musQuarterDotted}
\NewDocumentCommand{\musCorcheaDotted}  {}{\musEighthDotted}
\NewDocumentCommand{\musFusaDotted}     {}{\musEighthDotted}

\endinput

```