The `musicography` Package: Symbols for Music Writing with `pdflatex`

Andrew A. Cashner*

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Font packages for `pdflatex` 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 can be used with `pdflatex` and looks consistent and attractive. 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`.

Contents

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.

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

*`andrewacashner@gmail.com`

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	`\musFlat` or `\fl`	♭
Sharp	`\musSharp` or `\sh`	♯
Natural	`\musNatural` or `\na`	♮
Double Flat	`\musDoubleFlat`	𝄫
Double Sharp	`\musDoubleSharp`	𝄪

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)	`\musWhole` or `\musSemibreve`	𝅝
Half note (minim)	`\musHalf` or `\musMinim`	𝅗𝅥
Quarter note (semiminim)	`\musQuarter` or `\musSeminimin`	♩
Eighth note (corchea)	`\musEighth` or `\musCorchea`	♪
Sixteenth note	`\musSixteenth`	𝅘𝅥𝅯
Thirty-second note	`\musThirtySecond`	𝅘𝅥𝅰
Sixty-fourth note	`\musSixtyFourth`	𝅘𝅥𝅱

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

Dotted whole note	`\musWholeDotted`	𝅝.
Dotted quarter note	`\musQuarterDotted`	♩.
Dotted thirty-second note	`\musThirtySecondDotted`	𝅘𝅥𝅰.

2.3 Meter Signatures

Common duple	`\meterC`	𝐂
Alla breve	`\meterCutC`	𝐂
Ternary (16th–18th cent.)	`\meterCThree`	𝐂3
Ternary with 3 : 2 proportion	`\meterCThreeTwo`	$\mathbf{C}^3_2$
Spanish 17th-cent. ternary	`\meterCZ`	𝐂Z
Medieval *tempus perfectum*	`\meterO`	◯

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 $\overset{6\text{–}5}{\sharp}$, 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	`\musFig{7 5\musSharp}`	$\begin{matrix}7\\5\sharp\end{matrix}$
Three figures	`\musFig{7\musFlat{} 5 3}`	$\begin{matrix}7\flat\\5\\3\end{matrix}$
Four figures	`\musFig{7 5 4 2}`	$\begin{matrix}9\\7\\5\\3\end{matrix}$
Voice leading	`\musFig{7--6 5--4 3}`	$\begin{matrix}7\text{–}6\\5\text{–}4\\3\end{matrix}$
Voice leading	`\musFig{6--7 4--5 \noFig[2--]3}`	$\begin{matrix}7\text{–}6\\5\text{–}4\\3\end{matrix}$
Multiple figures per row	`\musFig{{6\musFlat{} 5} {\noFig[6\musFlat] \musSharp}}`	$\begin{matrix}6\flat\ 5\\\sharp\end{matrix}$

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`).

LaTeX 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

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}[2019/05/28
  Symbols for music writing with pdflatex]

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% and version 1.3 or later is part of all distributions
% of LaTeX version 2005/12/01 or later.
%
% 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
% 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 ebgaramond: \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}{ O{\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}{0pt}{#1\musStem}%
    \musSymbol{0pt}{0pt}{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{\musEighthDotted}{}{%
    \musDottedNote{\musEighth}%
}
\NewDocumentCommand{\musSixteenthDotted}{}{%
    \musDottedNote{\musSixteenth}%
```

```
}
\NewDocumentCommand{\musThirtySecondDotted}{}{%
    \musDottedNote{\musThirtySecond}%
}
\NewDocumentCommand{\musSixtyFourthDotted}{}{%
    \musDottedNote{\musSixtyFourth}%
}


% Command to stack numerals for metrical symbols or figured bass
% Takes any number of space-separated arguments and stacks them vertically
\RequirePackage{stackengine}
\NewDocumentCommand{\musStack}{ O{\musNumFont} m }{%
    {#1\Shortstack[l]{#2}}%
}

% Meter symbols
%  #1 symbol code for meter sign
\NewDocumentCommand{\musSymbolMeter}{ m }{%
    \raisebox{0.58ex}[8pt][2pt]{%
        {\kern-1pt\musFontBig\raisebox{0.3ex}{#1}\kern0.3em}%
    }%
}
% Meter that combines \meterC with numerals (e.g., C3 C3/2)
\NewDocumentCommand{\meterCplus}{ m }{\meterC{}\kern-0.7pt#1}

% Numeric meter signatures (e.g., 3/4)
%  #1 number on top
%  #2 number on bottom
\NewDocumentCommand{\musMeter}{ m m }{%
    \musStack{#1 #2}\kern0.05em
}
% Same command used for figured bass
\NewDocumentCommand{\musFigFont}{}{%
    \scriptsize
    \let\musFontLarge\musFontBig
}
\NewDocumentCommand{\musFig}{ m }{%
    \musStack[\musFigFont]{#1}%
}
\NewDocumentCommand{\noFig}{ O{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{\musSeminiminimDotted} {}{\musQuarterDotted}
\NewDocumentCommand{\musCorcheaDotted}     {}{\musEighthDotted}
\NewDocumentCommand{\musFusaDotted}        {}{\musEighthDotted}

\endinput
```