



# ConT<sub>E</sub>Xt

**title** : ConT<sub>E</sub>Xt User Modules

**subtitle** : LilyPond Connections (Music Typesetting)

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This module serves to include LilyPond music directly in the `CONTEXT` source, just as `METAPOST` code can be.

It is supposed to work only with LilyPond's stable version 2.10.

LilyPond 2.11 (and therefore probably 2.12) changed the output parameter.

### Complete list of options:

option	default	comment
<code>staffsize</code>	20	in pt
<code>indent</code>	0pt	first line indent
<code>time</code>	yes	count time? (i.e. show time signature, set bars, split line)
<code>clef</code>	yes	show clef?
<code>linewidth</code>	<code>localhsiz</code>	
<code>betweensystemspace</code>	54pt	space between systems
<code>height</code>	<code>textheight</code>	
<code>align</code>	?	default depends on <code>fragment=...</code>
<code>fragment</code>	no	
<code>barnumbers</code>	no	show numbers of measures?
<code>showempty</code>	no	drop empty staves?
<code>seriffont</code>	"TeX Gyre Schola"	font for e.g. lyrics
<code>sansfont</code>	"LMSans10"	font for e.g. chords
<code>monofont</code>	"LMTypewriter10"	normally not used

TODO: Proper support for multipage results.

TODO: LilyPond  $\rightarrow$  `CONTEXT`.

### Commented Source

As usual, we use a prefix for buffers, `\getparameters` etc.:

```

1 \writestatus{loading}{LilyPond module}
2 \startmodule[lilypond]
3 \unprotect
  \def\??lily{lilypond-}

```

Define the text snippets to be placed around fragments. Since LilyPond uses similar syntax to TeX, we must do some catcode fiddling.

```

4 \def\lily!slash{/}
5 \bgroup
  \catcode`\/=\\@escape
  /catcode`/\=@other
  /catcode`/#=@other
  /catcode`/<=@begingroup
  /catcode`/>=@endgroup
  /catcode`/{=@other
  /catcode`/}=/@other
  /catcode`/%=@other
  /catcode`/=-/@letter
  /gdef/lily!fragmentprefix<

```

```

/string^^J
/string^^J
{/string^^J
>

6 /gdef/lily!fragmentsuffix</string^^J
  }/string^^J
  >

7 /gdef/lily!prefix</string^^J
  /string^^J
  /string^^J
  \version "2.10.33"/string^^J
  \layout {/string^^J
    /iflily!time/else
      ragged-last = ##t/string^^J
      \context { \Score timing = ##f }/string^^J
      \context { \Staff \remove "Time_signature_engraver" }/string^^J
    /string^^J/fi
    /iflily!barnumbers/else
      \context { \Score \remove "Bar_number_engraver" }/string^^J
    /fi
    /string^^J
    /iflily!showempty/else
      \context { \RemoveEmptyStaffContext }/string^^J
      \context { \Score \override VerticalAxisGroup #'remove-first = ##t }/string^^J
    /fi
    /string^^J
    /iflily!clef/else
      \context { \Staff \remove "Clef_engraver" }/string^^J
    /fi
    /string^^J
    #(define fonts
      (make-pango-font-tree
        /lilypond-seriffont/space
        /lilypond-sansfont/space
        /lilypond-monofont/space
        (/lily!slash/space/lilypond-staffsize/space 20)))
  /string^^J
  }/string^^J
  \paper {/string^^J
    #(define dump-extents #t)/string^^J
    ragged-right = /iflily!align ##f/else ##t/fi/string^^J
    indent = /withoutpt/the/lily!indent\pt/string^^J
    line-width = /withoutpt/the/lily!linewidth\pt/string^^J
    vsize = /withoutpt/the/lily!vsize\pt/string^^J
    printpagenumber = ##f/string^^J
    oddFooterMarkup=##f/string^^J
    oddHeaderMarkup=##f/string^^J
    bookTitleMarkup = ##f/string^^J
    scoreTitleMarkup = ##f/string^^J
    ragged-bottom=##t/string^^J
    ragged-last-bottom=##t/string^^J
  }/string^^J

```

```

between-system-padding = #0/string^^J
between-system-space = /withoutpt/the/lily!betweensystemspace\pt/string^^J
}/string^^J
>

8 /gdef/lily!hash<#>
  /egroup

9 \newdimen\lily!linewidth
  \newdimen\lily!vsize
  \newdimen\lily!indent
  \newdimen\lily!betweensystemspace
  \newif\iflily!align
  \newif\iflily!clef
  \newif\iflily!time
  \newif\iflily!barnumbers
  \newif\iflily!showempty

10 \newcounter\lily!figures

```

Again, as usual, there is a `\setuplilypond` command that accepts the same parameters as `\lilypond` and `\startlilypond` do in their optional argument.

```

11 \def\setuplilypond{%
    \start\catcode`\#=\@other%
    \dosingleempty\dosetuplilypond%
  }

12 \def\dosetuplilypond[#1]{%
    \stop% \restore \catcode`\#
    \getparameters[\??lily] [#1]%
  }

```

We set the following defaults:

```

13 \setuplilypond
  [staffsize=20,
  indent=0pt,
  betweensystemspace=54pt,
  time=\v!yes,
  clef=\v!yes,
  align=?, % default depends on fragment=...
  fragment=\v!no,
  barnumbers=\v!no,
  showshowemptyempty=\v!no,
  seriffont="TeX Gyre Schola", % LilyPond default font
  sansfont="LMSans10",
  monofont="LMTypewriter10",
  ]

```

If you want to know which fonts of your system LilyPond can see with which names, try `lilypond -dshow-available-fonts any`. (The 3rd parameter is necessary, but can be anything.) There are a lot of restrictions, e.g. no fonts from the  $\TeX$  tree (don't know why), only one face per font file etc.

`\startlilypond` is a multistage implementation, because end-of-line characters must be treated specially in the `\startlilypond... \stoplilypond` range.

```

14 \def\startlilypond{%
    \bgroup%
    \catcode`\#=\@other%
    \dosingleempty\dostartlilypond%
  }

15 \def\dostartlilypond[#1]{%
    \obeylines%
    \dodostartlilypond[{#1}]%
  }

16 \long\def\dodostartlilypond[#1]#2\stoplilypond{%
    \egroup% from \startlilypond
    \bgroup%

```

The default of the `linewidth` parameter is the local `\hspace`.

```

17 \setlocalhspace
    \getparameters[\??lily] [linewidth=\the\localhspace,height=\the\textheight,#1]%
    \lily!linewidth\dimexpr\getvalue{\??lily linewidth}\relax
    \lily!vsize\dimexpr\getvalue{\??lily height}\relax
    \lily!indent\dimexpr\getvalue{\??lily indent}\relax
    \lily!betweensystemspace\dimexpr\getvalue{\??lily betweensystemspace}\relax

```

The default of `align` depends on whether we typeset a fragment:

```

18 \@EAEAEA\doifelse\getvalue{\??lily align}{\v!yes}%
    \lily!aligntrue\lily!alignfalse
    \@EAEAEA\doif\getvalue{\??lily fragment}{\v!no}{%
    \@EAEAEA\doif\getvalue{\??lily align}?
    \lily!aligntrue
  }%
    \@EAEAEA\doifelse\getvalue{\??lily time}{\v!yes}
    \lily!timetrue\lily!timefalse
    \@EAEAEA\doifelse\getvalue{\??lily barnumbers}{\v!yes}
    \lily!barnumberstrue\lily!barnumbersfalse
    \@EAEAEA\doifelse\getvalue{\??lily showempty}{\v!yes}
    \lily!showemptytrue\lily!showemptyfalse
    \@EAEAEA\doifelse\getvalue{\??lily clef}{\v!yes}
    \lily!cleftrue\lily!cleffalse

```

We are using a counter to keep the different LilyPond pieces separate. This allows to typeset them only once, during the first run.

TODO: This won't work any longer once we pass the remaining vertical space to LilyPond.

```

19 %\global\advance\lily!figures\plusone
    \doglobal\increment\lily!figures
    \edef\lily!filename{\bufferprefix lilypond-\lily!figures}%\the
    %\writestatus{buffering}{\lily!filename}
    %\startmode[*\v!first]%
    \def\obeyedlines{\string^^J}%

```

```

\convertargument#2\to\ascii
\expanded{%
\setbuffer[lilypond-\lily!figures]\the
\lily!prefix
\lily!hash(set-global-staff-size \getvalue{\??lily staffsize})\string^^J%
\ifundefined{\??lily fragment}\else\lily!fragmentprefix\fi
%% TODO: Option "packed"
\ascii%
\ifundefined{\??lily fragment}\else\lily!fragmentsuffix\fi
}% expanded
\endbuffer%

```

Generating a PDF directly always creates a whole page, so we generate EPS first.

```

20 \def\LP{texmfstart --ifchanged=\lily!filename.tmp --exec bin:lilypond
-beps -dno-gs-load-fonts -dincluded-eps-fonts -ddelete-intermediate-files
\lily!filename.tmp}

```

PATCH: For LilyPond 2.11+ replace `-b eps` with `-dbackend=eps!`

It would be nice, if `-ddelete-intermediate-files` would delete all useless intermediate files. More possible options in `lily.scm`.

```

21 \def\PDF{texmfstart --ifchanged=\lily!filename.eps pstopdf \lily!filename.eps}

```

The following line is needed for Lua<sub>T</sub><sub>E</sub>X, where buffers are kept in memory in contrast to other (older) flavours of T<sub>E</sub>X where they're written to a file automatically. We have to require writing to a file explicitly with `\savebuffer`.

```

22 \ifx\directlua\undefined \else \savebuffer[lilypond-\lily!figures]\fi
23 \executesystemcommand{\LP}%
\doif\jobsuffix{pdf}{%
\executesystemcommand{\PDF}%
}%
\doifelse\jobsuffix{pdf}
{\def\lily!img{\lily!filename .pdf}}%
{\def\lily!img{\lily!filename .eps}}%

```

We removed the previous `write18` check; `installprogram` doesn't work with recent ConTeXt versions.

TODO: Get the relevant dimension directly from LilyPond, to place the instrument name into the left margin for short snippets as well.

If we are not in the middle of some text, we have to check whether LilyPond created an image that is wider than requested: It places the instrument names in the left margin.

```

24 \ifvmode
\getfiguredimensions[\lily!filename.pdf]%
\leavevmode%
\newdimen\FigWidth
\FigWidth=\figurewidth
\ifdim\FigWidth>\localhsize
\!!dimena=\localhsize
\advance\!!dimena by-\FigWidth
\noindent\hskip\!!dimena

```

## LilyPond Connections (Music Typesetting)

```

\fi
\fi
\externalfigure[\lily!img]%
\egroup%
}%

```

For short snippets, we define an inline alternative to our start/stop pair:

```

25 \def\lilypond{\dosingleempty\dolilypond}
26 \def\dolilypond[#1]#2{\startlilypond[#1]#2\stoplilypond}
27 \stopmodule
28 \protect \doifnotmode{demo}{\endinput}

End of file

29 \starttext

30 \startbuffer[sample]
\subject{Telemann, TWV 40:11}
\startlilypond
\relative c' {
\set Staff.instrumentName = flute
\key fis \minor
\time 3/4
\partial 4
r8 fis'8 | fis4. cis8 a cis | fis, a cis fis a fis |
b, d fis b d b | eis,, gis cis eis gis b, |
a fis' gis, fis' cis eis | fis,4 r8
a' gis fis | e gis, a e' fis cis |
d fis, gis b e d | cis4 \trill r8
cis b a | b dis e gis cis, b |
a e' dis fis b, a | gis4 \trill r8
}
\stoplilypond
\stopbuffer

31 The input
\typebuffer[sample]
is typeset as
\getbuffer[sample]

32 \type{\startlilypond} accepts options, as in\crlf
\type{\startlilypond[staffsize=24, linewidth=14cm, indent=5cm, time=no, clef=no]}:
\nobreak
\startlilypond[staffsize=18,linewidth=14cm,indent=5cm,time=no,clef=no]
\relative c' {
\key fis \minor
\time 3/4
\partial 4
r8 fis'8 | fis4. cis8 a cis | fis, a cis fis a fis |
b, d fis b d b | eis,, gis cis eis gis b, |
a fis' gis, fis' cis eis | fis,4 r8

```



```

a' gis fis | e gis, a e' fis cis |
d fis, gis b e d | cis4 \trill r8
cis b a | b dis e gis cis, b |
a e' dis fis b, a | gis4 \trill r8
}
\stoplilypond

```

- 33 It is also possible to mix text and music:  
`\lower 8.2pt\hbox{\lilypond[fragment=true,staffsize=16,time=no]{g'}}` is a g.
- 34 (Seems like this still doesn't work...)
- 35 TODO: The `\type{\lower}` in the example above should not be necessary.
- 36 `\stoptext`

