

New features in 2.20 since 2.18

- LilyPond functions defined with `define-music-function`, `define-event-function`, `define-scheme-function` and `define-void-function` can now be directly called from Scheme as if they were genuine Scheme procedures. Argument checking and matching will still be performed in the same manner as when calling the function through LilyPond input. This includes the insertion of defaults for optional arguments not matching their predicates. Instead of using `\default` in the actual argument list for explicitly skipping a sequence of optional arguments, `*unspecified*` can be employed.
- Current input location and parser are now stored in GUILE fluids and can be referenced via the function calls `(*location*)` and `(*parser*)`. Consequently, a lot of functions previously taking an explicit `parser` argument no longer do so.

Functions defined with `define-music-function`, `define-event-function`, `define-scheme-function` and `define-void-function` no longer use `parser` and `location` arguments.

With those particular definitions, LilyPond will try to recognize legacy use of `parser` and `location` arguments, providing backwards-compatible semantics for some time.

- The `whiteout` grob property and `\whiteout` markup command now create a white background built from multiple displaced copies of the glyph in order to approximate the contours of its outline. The previous rounded box white background can be achieved with the new `whiteout-box` grob property and `\whiteout-box` markup command. Setting the `whiteout` property to a number now sets the thickness of the white outline as a multiple of staff-line thickness. Similarly, overriding the `thickness` property of the `\whiteout` markup command sets the thickness of the white outline it produces.
- In the "english" notename language, the long notenames for pitches with accidentals now contain a hyphen for better readability. You now have to write

```
\key a-flat \major
```

instead of the previous

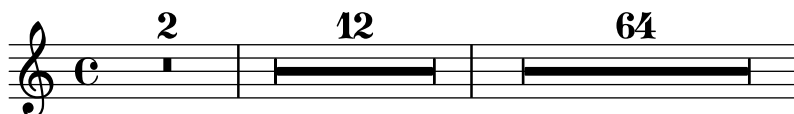
```
\key aflat \major
```

Double accidentals do not get another hyphen, so the Dutch `cisis` has the long English notename `c-sharpsharp`.

- The visual style of tremolo slashes (shape, style and slope) is now more finely controlled.



- Multi-measure rests have length according to their total duration, under the control of `MultiMeasureRest.space-increment`.



- Page numbers may now be printed in roman numerals, by setting the `page-number-type` paper variable.
- It is now possible to use `\time` and `\partial` together to change the time signature in mid measure.

```

\override Score.BarNumber.break-visibility = #end-of-line-invisible
\partial 4 \time 3/4 f4 | 2 4 | 2 \bar "||"
\time 9/8 \partial 4. f8 8 8 | 2. 8 8 8 |

```



- It is now possible to override the `text` property of chord names.

```

<<
\new ChordNames \chordmode {
  a' b c:7
  \once \override ChordName.text = #"foo"
  d
}
>>

```

A B C⁷ foo

- Improved horizontal alignment when using `TextScript`, with `DynamicText` or `LyricText`.
- A new command `\magnifyStaff` has been added which scales staff sizes, staff lines, bar lines, beamlets and horizontal spacing generally at the `Staff` context level. Staff lines are prevented from being scaled smaller than the default since the thickness of stems, slurs, and the like are all based on the staff line thickness.
- `InstrumentName` now supports `text-interface`.
- There is now support for controlling the ‘expression level’ of MIDI channels using the `Staff.midiExpression` context property. This can be used to alter the perceived volume of even sustained notes (albeit in a very ‘low-level’ way) and accepts a number value between 0.0 and 1.0.

```

\score {
  \new Staff \with {
    midiExpression = #0.6
    midiInstrument = #"clarinet"
  }
  <<
    { a'1~ a'1 }
    {
      \set Staff.midiExpression = #0.7 s4\f\<
      \set Staff.midiExpression = #0.8 s4
      \set Staff.midiExpression = #0.9 s4
      \set Staff.midiExpression = #1.0 s4

      \set Staff.midiExpression = #0.9 s4\>
      \set Staff.midiExpression = #0.8 s4
      \set Staff.midiExpression = #0.7 s4
      \set Staff.midiExpression = #0.6 s4\!
    }
  >>
  \midi { }
}

```

- Support for making it easier to use alternative ‘music’ fonts other than the default Emmentaler in LilyPond has been added. See <http://fonts.openlilylib.org/> for more information.
- Grobs and their parents can now be aligned separately allowing more flexibility for grob positions. For example the ‘left’ edge of a grob can now be aligned on the ‘center’ of its parent.
- Improvements to the `\partial` command have been made to avoid problems when using multiple, parallel contexts.
- `\chordmode` can now use `< >` and `<< >>` constructs.
- The `NullVoice` context is now ‘below’ `Score`.

- A new command `\tagGroup` has now been added. This compliments the existing `\keepWithTag` and `\removeWithTag` commands. For Example:

```
\tagGroup #'(violinI violinII viola cello)
```

declares a list of ‘tags’ that belong to a single ‘tag group’.

```
\keepwithTag#'violinI
```

Is now only concerned with ‘tags’ from ‘violinI’s tag group.

Any element of the included music tagged with one or more tags from the group, but *not* with *violinI*, will be removed.

- The `\addlyrics` function now works with arbitrary contexts including `Staff`.
- String numbers can now also be used to print roman numerals (e.g. for unfretted string instruments).

```
c2\2
\romanStringNumbers
c\2
\arabicStringNumbers
c1\3
```



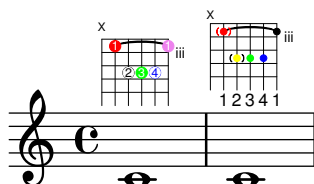
- The `thin-kern` property of the `BarLine` grob has been renamed to `segno-kern`.
- `KeyCancellation` grobs now ignore cue clefs (like `KeySignature` grobs do).
- Add support for `\once` `\unset`
- It is now possible to individually color both the dots and parentheses in fret diagrams when using the `\fret-diagram-verbose` markup command.

```
\new Voice {
  c1^\markup {
    \override #'(fret-diagram-details . (
      (finger-code . in-dot))) {
      \fret-diagram-verbose #'((mute 6)
        (place-fret 5 3 1 red)
        (place-fret 4 5 2 inverted)
        (place-fret 3 5 3 green)
        (place-fret 2 5 4 blue inverted)
        (place-fret 1 3 1 violet)
        (barre 5 1 3 ))
      }
  }
```

```

}
c1^\markup {
  \override #'(fret-diagram-details . (
    (finger-code . below-string))) {
    \fret-diagram-verbose #'((mute 6)
      (place-fret 5 3 1 red parenthesized)
      (place-fret 4 5 2 yellow
        default-paren-color
        parenthesized)
      (place-fret 3 5 3 green)
      (place-fret 2 5 4 blue )
      (place-fret 1 3 1)
      (barre 5 1 3))
    }
  }
}

```

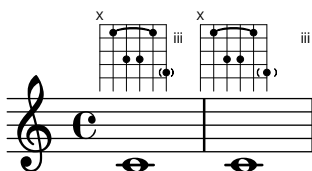


- Two new properties have been added for use in `fret-diagram-details` when using the `\fret-diagram-verbose` markup command; `fret-label-horizontal-offset` which affects the `fret-label-indication` and `paren-padding` which controls the space between the dot and the parentheses surrounding it.

```

\new Voice {
  c1^\markup {
    \fret-diagram-verbose #'((mute 6)
      (place-fret 5 3 1)
      (place-fret 4 5 2)
      (place-fret 3 5 3)
      (place-fret 1 6 4 parenthesized)
      (place-fret 2 3 1)
      (barre 5 2 3))
    }
  c1^\markup {
    \override #'(fret-diagram-details . (
      (fret-label-horizontal-offset . 2)
      (paren-padding . 0.25))) {
      \fret-diagram-verbose #'((mute 6)
        (place-fret 5 3 1)
        (place-fret 4 5 2)
        (place-fret 3 5 3)
        (place-fret 1 6 4 parenthesized)
        (place-fret 2 3 1)
        (barre 5 2 3))
      }
    }
  }
}

```



- A new markup command `\justify-line` has been added. Similar to the `\fill-line` markup command except that instead of setting *words* in columns, the `\justify-line` command balances the whitespace between them ensuring that when there are three or more words in a markup, the whitespace is always consistent.

```
\markup \fill-line {ooooooo ooooooo ooooooo ooooooo}
\markup \fill-line {ooooooooo ooooooooo oo ooo}
```

```
ooooooo      ooooooo      ooooooo      ooooooo
```

```
oooooooooooo  oooooooooo      oo      ooo
```

```
\markup \justify-line {ooooooo ooooooo ooooooo ooooooo}
\markup \justify-line {oooooooooooo oooooooooo oo ooo}
```

```
ooooooo      ooooooo      ooooooo      ooooooo
```

```
oooooooooooo  oooooooooo      oo      ooo
```

- A new command `\magnifyMusic` has been added, which allows the notation size to be changed without changing the staff size, while automatically scaling stems, beams, and horizontal spacing.

```
\new Staff <<
  \new Voice \relative {
    \voiceOne
    <e' e'>4 <f f'>8. <g g'>16 <f f'>8 <e e'>4 r8
  }
  \new Voice \relative {
    \voiceTwo
    \magnifyMusic 0.63 {
      \override Score.SpacingSpanner.spacing-increment = #(* 1.2 0.63)
      r32 c'' a c a c a c r c a c a c a c
      r c a c a c a c a c a c a c a c
    }
  }
>>
```



- A new flexible template suitable for a range of choral music, is now provided. This may be used to create simple choral music, with or without piano accompaniment, in two or four staves. Unlike other templates, this template is ‘built-in’, which means it does not need to be copied and edited: instead it is simply `\include`d in the input file. For details, see Section “Built-in templates” in *Learning Manual*.
- The positioning of tuplet numbers for kneed beams has been significantly improved. Previously, tuplet numbers were placed according to the position of the tuplet bracket, even if it was not printed. This could lead to stranded tuplet numbers. Now they are now positioned

closer to the kneed-beam when an appropriate beam segment exists for its placement and when the the bracket is not drawn.

Collision detection is also added, offsetting horizontally if too close to an adjoining note column but preserving the number's vertical distance from the kneed beam. If the number itself is too large to fit in the available space the original, bracket-based, positioning system is used instead; and in the event of a collision (e.g. with an accidental) the tuplet number is moved vertically away instead.

```
\time 3/4
\override Beam.auto-knee-gap = 3
\tuplet 3/2 4 {
  g8 c'' e,
  c'8 g,, e''
  g,,8 e''' c,,
}
```



The original kneed-beam tuplet behavior is still available through an `\override` via a new, `knee-to-beam` property.

```
\time 3/4
\override Beam.auto-knee-gap = 3
\override TupletNumber.knee-to-beam = ##f
\tuplet 3/2 4 {
  g8 c'' e,
  c'8 g,, e''
  g,,8 e''' c,,
}
```



- `\lyricsto` and `\addLyrics` have been ‘harmonized’. Both now accept the same kind of delimited argument list that `\lyrics` and `\chords` accept. Backward compatibility has been added so music identifiers (i.e. `\mus`) are permitted as arguments. A `convert-ly` rule has been added that removes redundant uses of `\lyricmode` and rearranges combinations with context starters such that `\lyricsto` in general is applied last (i.e. like `\lyricmode` would be).
- Scheme functions and identifiers can now be used as output definitions.
- Scheme expressions can now be used as chord constituents.
- Improved visual spacing of small and regular ‘MI’ Funk and Walker noteheads so they are now the same width as other shaped notes in their respective sets. SOL noteheads are also now visually improved when used with both the normal Aiken and Sacred Harp heads, as well as with the thin variants.
- `LeftEdge` now has a definable `Y-extent` (i.e. vertical). See Section “LeftEdge” in *Internals Reference*.

- Added a new `make-path-stencil` function that supports all `path` commands both relative and absolute:
`lineto`, `rlineto`, `curveto`, `rcurveto`, `moveto`, `rmoveto`, `closepath`. The function also supports ‘single-letter’ syntax used in standard SVG path commands:
`L`, `l`, `C`, `c`, `M`, `m`, `Z` and `z`. The new command is also backward-compatible with the original `make-connected-path-stencil` function. Also see `scm/stencil.scm`.
- Context properties named in the ‘`alternativeRestores`’ property are restored to their value at the start of the *first* alternative in all subsequent alternatives.

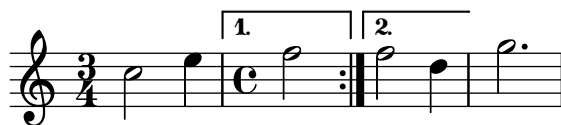
Currently the default set restores ‘current meter’;

```
\time 3/4
\repeat volta 2 { c2 e4 | }
\alternative {
  { \time 4/4 f2 d | }
  { f2 d4 | }
}
g2. |
```



‘measure position’;

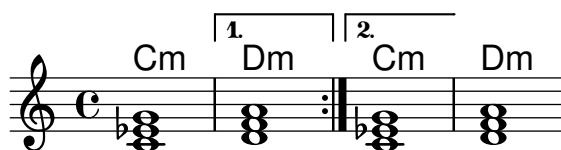
```
\time 3/4
\repeat volta 2 { c2 e4 | }
\alternative {
  { \time 4/4
    \set Timing.measurePosition = #(ly:make-moment -1/2)
    f2 | }
  { f2 d4 | }
}
g2. |
```



and ‘chord changes’;

```
<<
\new ChordNames {
  \set chordChanges = ##t
  \chordmode { c1:m d:m c:m d:m }
}
\new Staff {
  \repeat volta 2 { \chordmode { c1:m } }
  \alternative {
    { \chordmode { d:m } }
    { \chordmode { c:m } }
  }
  \chordmode { d:m }
}
}
```

>>



- Improved MIDI output for breathe marks. After tied notes, breaths take time *only* from the last note of the tie; e.g. { c4~ c8 \breathe } performs as { c4~ c16 r } instead of { c4 r8 }. This is more consistent with articulations and how humans interpret breaths after ties. It now also makes it easier to align simultaneous breathe marks over multiple parts, all with different note lengths.
- A new note head style for Tabulature has been added; `TabNoteHead.style = #'slash`.
- Four new Clef glyphs have been added *Double G*, *Tenor G*, *Varpercussion* and *varC* and their related tessitura.

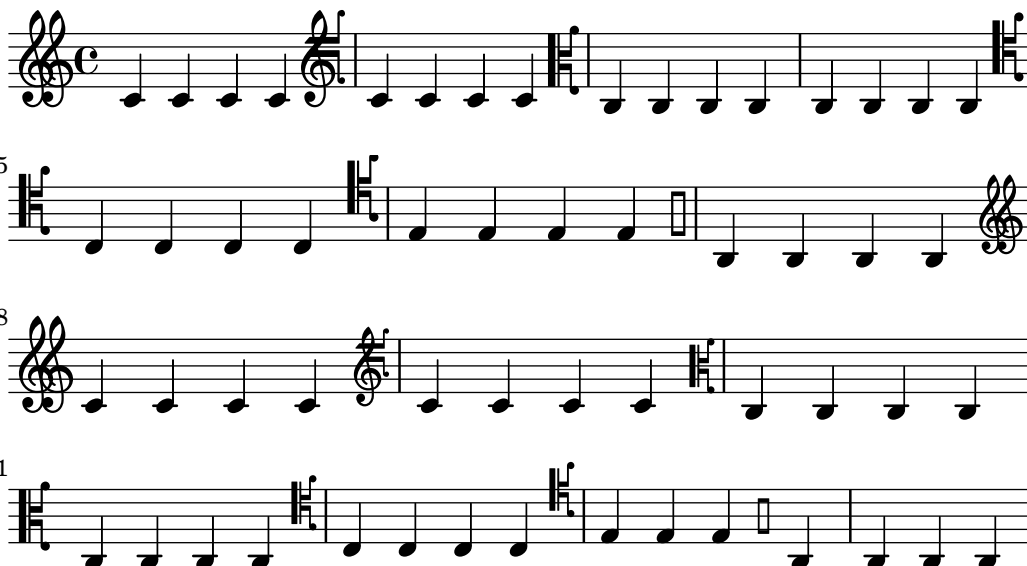
```
\override Staff.Clef.full-size-change = ##t
```

```
\clef "GG" c c c c
\clef "tenorG" c c c c
\clef "varC" c c c c
\clef "altovarC" c c c c
\clef "tenorvarC" c c c c
\clef "baritonevarC" c c c c
\clef "varpercussion" c c c c
```

```
\break
```

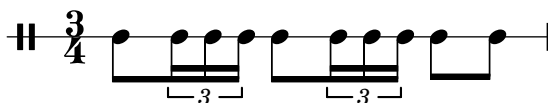
```
\override Staff.Clef.full-size-change = ##f
```

```
\clef "GG" c c c c
\clef "tenorG" c c c c
\clef "varC" c c c c
\clef "altovarC" c c c c
\clef "tenorvarC" c c c c
\clef "baritonevarC" c c c
\clef "varpercussion" c c c c
```



- Isolated durations in music sequences now stand for unpitched notes. This may be useful for specifying rhythms to music or scheme functions. When encountered in the final score, the pitches are provided by the preceding note or chord. Here are two examples where this makes for readable input:

```
\new DrumStaff \with { \override StaffSymbol.line-count = 1 }
\drummode {
  \time 3/4
  tambourine 8 \tuplet 3/2 { 16 16 16 }
              8 \tuplet 3/2 { 16 16 16 } 8 8 |
}
```



```
\new Staff { r16 c'16 ~ 8 ~ 4 ~ 2 | }
```



- `\displayLilyMusic` and its underlying Scheme functions no longer omit redundant note durations. This makes it easier to reliably recognize and format standalone durations in expressions like

```
{ c4 d4 8 }
```

- Beaming exceptions can now be constructed using the `\beamExceptions` scheme function. One can now write

```
\time #'(2 1) 3/16
\set Timing.beamExceptions =
  \beamExceptions { 32[ 32] 32[ 32] 32[ 32] }
c16 c c |
\repeat unfold 6 { c32 } |
```



with multiple exceptions separated with | bar checks (writing the exception pattern without pitches is convenient but not mandatory). Previously, setting the beam exceptions would have required writing

```
\set Timing.beamExceptions =
#'(
  (end . ;start of alist
    (end . ;entry for end of beams
      ( ;start of alist of end points
        ((1 . 32) . (2 2 2)) ;rule for 1/32 beams -- end each 1/16
      )))
```

- The most common articulations are now reflected in MIDI output. Accent and marcato make notes louder; staccato, staccatissimo and portato make them shorter. Breath marks shorten the previous note.

This behavior is customizable through the `midiLength` and `midiExtraVelocity` properties on `ArticulationEvent`. See `script-init.ly` for examples.

- The PostScript functionality of stroke adjustment is no longer applied automatically but left to the discretion of the PostScript device (by default, Ghostscript uses it for resolutions up to 150dpi when generating raster images). When it is enabled, a more complex drawing algorithm designed to benefit from stroke adjustment is employed mostly for stems and bar lines.

Stroke adjustment can be forced by specifying the command line option ‘**-dstrokeadjust**’ to LilyPond. When generating PDF files, this will usually result in markedly better looking PDF previews but significantly larger file size. Print quality at high resolutions will be unaffected.