PLT Framework: GUI Application Framework

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Part I

Introduction

1. This Manual

This manual describes a framework for programmers developing applications MrEd. It assumes familiarity with MrEd as described in *PLT MrEd: Graphical Toolbox Manual* and MzScheme as described in *PLT MzScheme: Language Manual*.

1.1 Thanks

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This manual was typest using LaTeX and a patched version of `latex2html`. Some typesetting macros were originally taken from Julian Smart's *Reference Manual for wxWindows 1.60: a portable C++ GUI toolkit*.

2. Overview

The Framework is a library that provides application framework for MrEd. It is designed to make implementation of an application in MrEd simpler and easier. It provides standard classes and utilities for managing

- Frames, section 11,
- Editors, section 7,
- and many others.

See the libraries, in section 3.1 for information on how to load the framework into an application.

3. Preliminaries

3.1 Libraries

The framework provides these libraries:

- **Entire Framework**
  - `(require-library "framework.ss" "framework")` This library adds all of the definitions and macros in this manual to the top-level.
  - `(require-library "frameworks.ss" "framework")`
    This library adds a signature definitions `framework^` and signature definitions for each of the constituent units for the **"frameworkr.ss"** unit. It also requires the **macro.ss** library, the **tests.ss** library.
  - `(require-library "frameworkr.ss" "framework")`
    This library returns a `unit/sig`, §7.3.2 in *PLT MzScheme: Language Manual* that imports two units. The first must be the result of `(require-library "corer.ss")`, §15.2.6 in *PLT MzScheme: Language Manual* and the second must be `mred@`, which is built in to *PLT MrEd: Graphical Toolbox Manual*.
    This unit exports several sub-units. Each sub unit corresponds to one chapter in the Reference part of this manual.
  - `(require-library "macro.ss" "framework")` This defines the mixin macro. See Mixins, section 3.2 for more information.
- **Test Suite Engine**
  - `(require-library "test.ss" "framework")` This library adds all of the definitions in chapter 27 to the top-level.
  - `(require-library "tests.ss" "framework")`
    This library adds all of the signature definitions needed for the testing engine to the top-level.
  - `(require-library "testr.ss" "framework")`
    This library returns a `unit/sig`, §7.3.2 in *PLT MzScheme: Language Manual* that imports two units. The first must be `mred@`, which is built in to MrEd, and the second must be the result of `(require-library "keys.ss" "framework")`
  - `(require-library "keys.ss" "framework")`
    This library returns a `unit/sig`, §7.3.2 in *PLT MzScheme: Language Manual* that imports nothing. It matches the `framework:keys^` signature, defined by the `"tests.ss"` library, described above.
- **GUI Utilities**
  - `(require-library "guiutils.ss" "framework")`
    This libraries adds all of the definitions in chapter **??** to the top-level.
  - `(require-library "guiutilsr.ss" "framework")`
    Requiring this library results in a unit that imports the `mred@` unit and exports `framework:gui-utils^`.
  - `(require-library "guiutilss.ss" "framework")`

This libraries defines the signature `framework:gui-utils^` that contains all of the names in chapter **??**. These names do not have the `gui-utils:` prefix in the signature.

- **Preferences Library Filename Specification**

  This is an alternate library that allows you to specify the location of the preferences file for the preferences library, instead of using the default one. The expression:

  ```
  (require-library "frameworkp.ss" "framework")
  ```

  evaluates to a unit that imports a unit matching the `mred^` signature, one matching `mzlib:core^` and one matching `framework:prefs-file^`. The signature `framework:prefs-file^` only contains one name: `preferences-filename`. This is expected to be a string naming the preferences file location.

The framework provides libraries to accomodate two styles of program construction: with units and through the top-level. Programmers who only use the top-level to construct their programs should use **"framework.ss"**. Programmers who use units to construct their programs should first require **"frameworks.ss"** and then use **"frameworkr.ss"** to construct their programs.

3.2 Mixins

The framework relies heavily on mixins. A mixin is a class parameterization modeled on a paper published by Flatt, Felleisen, and Krishnamurthi, available at `http://www.cs.rice.edu/CS/PLT/Publications/#ffk-pldi97`. The implementation of these mixins in MzScheme is with the combination of `lambda` and `class`. The framework provides a macro to simplify the checking and implementation of these mixins. It's syntax is very similar to the syntax for `class`, §6 in *PLT MzScheme: Language Manual*. The shape of a mixin is:

```
(mixin (interface-expr ...) (interface-expr ...) initialization-variables
   instance-variable-clause ...)
```

This macro expands into a procedure that accepts a class. The argument passed to this procedure must match the interfaces of the first *interface-expr*s expressions. The procedure returns a class that is derived from its argument. This result class must match the interfaces specified in the second *interface-expr*s section; it has initialization arguments specified by *initialization-arguments* and clauses specified by *instance-variable-clause*s. The syntax of the *initialization-variables* and *instance-variable-clause* are exactly the same as `class*/names`, §6.3 in *PLT MzScheme: Language Manual*.

The `mixin` macro does some checking to be sure that variables that the *instance-variable-clause*s refer to in their super class are in the interfaces. That checking and the checking that the input class matches the declared interfaces aside, the mixin macro's expansion is something like this:

```
(mixin (i<%> ...) (j<%>...) args
   clause ...)
=
(lambda (%)
   (class* % (j<%> ...) args
      clause ...))
```

The `mixin` macro is provided by

```
(require-library "macro.ss" "framework")
```

.

3.3 Type Language

The types on method arguments are described using a slightly enhanced version of MrSpidey's type language.

```
T =   (rec ([<id> <T>]...) <T>)        ; recursive types
      (union <T> ...)                  ; union "or"
      (T ... -> T ...)                 ; function (possible multiple value return)
      (T ... ->* T)                    ; function – see below for explanation
      (T *-> T ...)                    ; function – see below for explanation
      (T *->* T)                       ; function – see below for explanation
      (cons T T)                       ; all pairs with components in T and T
      (vectorof T)                     ; a vector whose elements are all T
      (vector T ...)                   ; a vector whose elements have types as listed
      <symbol>                         ; 'a, 'b, etc.
      <number>                         ; any scheme number
      #t                               ; true
      #f                               ; false
      null                             ; the empty list
      TST                              ; any value whatsoever
      exact-int                        ; a number that is both exact and an integer
      (instance c%)                    ; object created from c%
      (instance i<%>)                  ; object whose class implements i<%>
      (dervied-from c%)                ; class derived from c%
      (implements i<%>)                ; class that implements i<%>
      <predicate>                      ; whatever value set the predicate recognizes

predicate =  integer | real | input-port | boolean
          | void | string
          | regexp | exact | inexact | eof | char
          | interface
```

The function types with asterisks are used for multiple arity and multiple return values. When an asterisk is present in front of the arrow, the teyp before the arrow must be a list and the elements of the list are the arguments of the function. Similarly, when an asterisk appears at the end of the arrow the type after the arrow must be a list whose elements are the types of the multiple return values of the function.

There are also a few shorthands the documentation uses:

```
(listof <T>) = (rec ([X (union (cons T X) null)]) X)
printable =
    (rec ([X (union (cons X X)
                    (vectorof X)
                    number boolean void string)])
      X)
```

Part II

Reference

4. Application

The procedure in this chapter is used to supply information about your application to the framework.

4.1 Application Utilities

`application:current-app-name`

This is a parameter specifying the name of the current application. It is used in the help menu (see `frame:standard-menus%`) and in frame titles (see `frame:editor%`).

- `(application:current-app-name` *name*`)` ⇒ void
  name : string

  Sets the name of the application to *name*

- `(application:current-app-name)` ⇒ string

  returns the current name of the application.

5. Autosave

Autosaving in MrEd is performed by registering with a single autosaver daemon. Objects that are registered with the autosaver must have a `do-autosave` method that is called periodically with no arguments.

5.1 Autosave Utilities

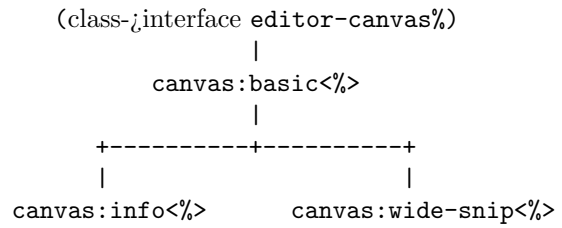
`autosave:register`

- (`autosave:register` *obj*) ⇒ void
  obj : (object [do-autosave (-¿ void)])

  Adds *obj* to the list of objects to be autosaved. When it is time to autosave, the `do-autosave` method of the object is called. This method is responsible for performing the autosave.

  There is no need to de-register an object because the autosaver keeps a "weak" pointer to the object; i.e., the autosaver does not keep an object from garbage collection.

6. Canvas



6.1 canvas:basic<%>

Extends: (class->interface editor-canvas%)

6.2 canvas:basic-mixin

Domain: (class->interface editor-canvas%)

Implements: canvas:basic<%>

- (make-object canvas:basic-mixin% *parent editor style scrolls-per-page*) ⇒ canvas:basic-mixin% object
  parent : frame%, dialog%, panel%, or pane% object
  editor = #f : text% or pasteboard% object or #f
  style = null : list of symbols in '(no-hscroll no-vscroll hide-hscroll hide-vscroll)
  scrolls-per-page = 100 : exact integer in [1, 10000]

  The *style* list can contain the following flags:

  - 'no-hscroll — disallows horizontal scrolling
  - 'no-vscroll — disallows vertical scrolling
  - 'hide-hscroll — allows horizontal scrolling, but hides the horizontal scrollbar
  - 'hide-vscroll — allows vertical scrolling, but hides the vertical scrollbar

  While vertical scrolling of text editors is based on lines, horizontal scrolling and pasteboard vertical scrolling is based on a fixed number of steps per horizontal page. The *scrollsPerPage* argument sets this value.

  If a canvas is initialized with #f for *editor*, install an editor later with set-editor.

6.3 canvas:info<%>

Extends: canvas:basic<%>

6.4 canvas:info-mixin

Domain: canvas:basic<%>

Implements: canvas:info<%>

Implements: canvas:basic<%>

on-focus

Called when a window receives or loses the keyboard focus. If the argument is #t, the keyboard focus was received, otherwise it was lost.

Note that under X, keyboard focus can move to the menu bar when the user is selecting a menu item.

- (send *a-canvas:info-mixin* on-focus) ⇒ void

  Enables or disables the caret in the display's editor, if there is one.

  sets the canvas that the frame displays info about.

set-editor

Sets the editor that is displayed by the canvas, releasing the current editor (if any). If the new editor already has an administrator that is not associated with a editor-canvas%, then the new editor is *not* installed into the canvas.

- (send *a-canvas:info-mixin* set-editor) ⇒ void

  If *redraw?* is #f, then the editor is not immediately drawn; in this case, something must force a redraw later (e.g., a call to the on-paint method).

  If the canvas has a line count installed with set-line-count, the canvas's miniumum height is adjusted.

  Calls set-info-canvas to this canvas, if it has the focus in the frame.

6.5 canvas:wide-snip<%>

Extends: canvas:basic<%>

Any canvas% that matches this interface will automatically resize selected snips when it's size changes. Use add-tall-snip and add-wide-snip to specify which snips should be resized.

`add-tall-snip`

Snips passed to this method will be resized when the canvas's size changes. Their height will be set so they take up all of the space from their tops to the bottom of the canvas.

- (`send` *a-canvas:wide-snip* `add-tall-snip` *snip*) ⇒ void
  snip : (instance `snip%`)

`add-wide-snip`

Snips passed to this method will be resized when the canvas's size changes. Their width will be set so they take up all of the space from their lefts to the right edge of the canvas.

- (`send` *a-canvas:wide-snip* `add-wide-snip` *snip*) ⇒ void
  snip : (instance `snip%`)

6.6 `canvas:wide-snip-mixin`

Domain: `canvas:basic<%>`

Implements: `canvas:wide-snip<%>`

Implements: `canvas:basic<%>`

This canvas mantains a list of wide and tall snips and adjusts their heights and widths when the canvas's size changes.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`on-size`

Called when the window is resized. The window's new size (in pixels) is provided to the method. The size values are for the entire window, not just the client area.

- (`send` *a-canvas:wide-snip-mixin* `on-size` *width height*) ⇒ void
  width : exact integer in [0, 10000]
  height : exact integer in [0, 10000]

  If the canvas is dispalying an editor, its `on-display-size` method is called.

  Adjusts the sizes of the marked snips.

  See `add-wide-snip` and `add-tall-snip`.

6.7 `canvas:basic% = (canvas:basic-mixin editor-canvas%)`

```
canvas:basic% = (canvas:basic-mixin editor-canvas%)
```

- (`make-object` `canvas:basic%` *parent editor style scrolls-per-page*) ⇒ `canvas:basic%` object
  parent : `frame%`, `dialog%`, `panel%`, or `pane%` object

editor = #f : text% or pasteboard% object or #f
style = null : list of symbols in '(no-hscroll no-vscroll hide-hscroll hide-vscroll)
scrolls-per-page = 100 : exact integer in [1, 10000]

The *style* list can contain the following flags:

- 'no-hscroll — disallows horizontal scrolling
- 'no-vscroll — disallows vertical scrolling
- 'hide-hscroll — allows horizontal scrolling, but hides the horizontal scrollbar
- 'hide-vscroll — allows vertical scrolling, but hides the vertical scrollbar

While vertical scrolling of text editors is based on lines, horizontal scrolling and pasteboard vertical scrolling is based on a fixed number of steps per horizontal page. The *scrollsPerPage* argument sets this value.

If a canvas is initialized with #f for *editor*, install an editor later with set-editor.

6.8 canvas:info% = (canvas:info-mixin canvas:basic%)

canvas:info% = (canvas:info-mixin canvas:basic%)

- (make-object canvas:info% *parent editor style scrolls-per-page*) ⇒ canvas:info% object
  parent : frame%, dialog%, panel%, or pane% object
  editor = #f : text% or pasteboard% object or #f
  style = null : list of symbols in '(no-hscroll no-vscroll hide-hscroll hide-vscroll)
  scrolls-per-page = 100 : exact integer in [1, 10000]

  The *style* list can contain the following flags:

  - 'no-hscroll — disallows horizontal scrolling
  - 'no-vscroll — disallows vertical scrolling
  - 'hide-hscroll — allows horizontal scrolling, but hides the horizontal scrollbar
  - 'hide-vscroll — allows vertical scrolling, but hides the vertical scrollbar

  While vertical scrolling of text editors is based on lines, horizontal scrolling and pasteboard vertical scrolling is based on a fixed number of steps per horizontal page. The *scrollsPerPage* argument sets this value.

  If a canvas is initialized with #f for *editor*, install an editor later with set-editor.

6.9 canvas:wide-snip% = (canvas:wide-snip-mixin canvas:basic%)

canvas:wide-snip% = (canvas:wide-snip-mixin canvas:basic%)

- (make-object canvas:wide-snip% *parent editor style scrolls-per-page*) ⇒ canvas:wide-snip% object
  parent : frame%, dialog%, panel%, or pane% object
  editor = #f : text% or pasteboard% object or #f
  style = null : list of symbols in '(no-hscroll no-vscroll hide-hscroll hide-vscroll)
  scrolls-per-page = 100 : exact integer in [1, 10000]

  The *style* list can contain the following flags:

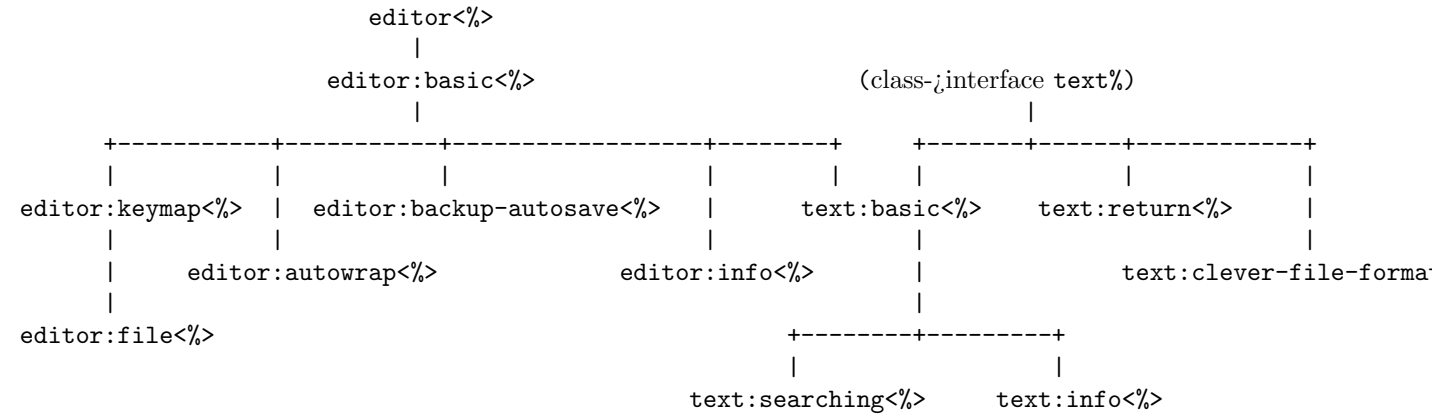
  - 'no-hscroll — disallows horizontal scrolling
  - 'no-vscroll — disallows vertical scrolling
  - 'hide-hscroll — allows horizontal scrolling, but hides the horizontal scrollbar
  - 'hide-vscroll — allows vertical scrolling, but hides the vertical scrollbar

While vertical scrolling of text editors is based on lines, horizontal scrolling and pasteboard vertical scrolling is based on a fixed number of steps per horizontal page. The *scrollsPerPage* argument sets this value.

If a canvas is initialized with `#f` for *editor*, install an editor later with `set-editor`.

7. Editor

This is the interface hierarchy for the editor and text classes in the framework.



7.1 editor:basic<%>

Extends: editor<%>

Classes matching this interface support the basic editor<%> functionality required by the framework.

editing-this-file?

Indicates if the file in this editor is open for editing, or merely for viewing.

- (send *an-editor:basic* editing-this-file?) ⇒ boolean

  Returns #f.

get-top-level-window

Returns the top-level-window<%> currently associated with this buffer.

This does not work for embedded editors.

- (send *an-editor:basic* get-top-level-window) ⇒ (implements top-level-window<%>)

`has-focus?`

This function returns `#t` when the editor has the keyboard focus. It is implemented using: `on-focus`

- `(send` *an-editor:basic* `has-focus?)` ⇒ boolean

`local-edit-sequence?`

Indicates if this editor is in an edit sequence. Enclosing buffer's edit-sequence status is not considered by this method.

See `begin-edit-sequence` and `end-edit-sequence` for more info about edit sequences.

- `(send` *an-editor:basic* `local-edit-sequence?)` ⇒ boolean

`locked?`

Indicates if this buffer is locked. See also `lock`.

- `(send` *an-editor:basic* `locked?)` ⇒ boolean

`on-close`

This method is called when a frame that shows this buffer is closed.

- `(send` *an-editor:basic* `on-close)` ⇒ void

  Does nothing.

`run-after-edit-sequence`

This method is used to install callbacks that will be run after any edit-sequence completes.

- `(send` *an-editor:basic* `run-after-edit-sequence` *thunk tag)* ⇒ void
  thunk : (-¿ void)
  tag = `#f` : (union symbol #f)

  The procedure *thunk* will be called immediately if the edit is not in an edit-sequence. If the edit is in an edit-sequence, it will be called when the edit-sequence completes.

  If *tag* is a symbol, the *thunk* is keyed on that symbol, and only one thunk per symbol will be called after the edit-sequence. Specifically, the last call to `run-after-edit-sequence`'s argument will be called.

7.2 editor:basic-mixin

Domain: `editor<%>`

Implements: `editor:basic<%>`

Implements: editor<%>

This provides the basic editor services required by the rest of the framework.

The result of this mixin uses the same initialization arguments as the mixin's argument.

Each instance of a class created with this mixin contains a private keymap% that is chained to the global keymap via: (send *keymap* chain-to-keymap (keymap:get-global) #f).

This installs the global keymap keymap:get-global to handle keyboard and mouse mappings not handled by *keymap*. The global keymap is created when the framework is invoked.

after-edit-sequence

Called after a top-level edit sequence completes (involving unnested begin-edit-sequence and end-edit-sequence).

See also on-edit-sequence.

- (send *an-editor:basic-mixin* after-edit-sequence) ⇒ void

  Helps to implement run-after-edit-sequence.

begin-edit-sequence

The begin-edit-sequence and end-edit-sequence methods are used to bracket a set of editor modifications so that the results are all displayed at once. The commands may be nested arbitrarily deep. Using these functions can greatly speed up displaying the changes.

When a editor contains other editors, using begin-edit-sequence and end-edit-sequence on the main editor brackets some changes to the sub-editors as well, but it is not as effective when a sub-editor changes as calling begin-edit-sequence and end-edit-sequence for the sub-editor.

See also refresh-delayed?.

- (send *an-editor:basic-mixin* begin-edit-sequence *undoable?*) ⇒ void
  undoable? : boolean

  If the *undoable?* flag is #f, then the changes made in the sequence cannot be reversed through the undo method. This flag is only effective for the outermost begin-edit-sequence when nested sequences are used.

  See end-edit-sequence.

end-edit-sequence

See begin-edit-sequence.

- (send *an-editor:basic-mixin* end-edit-sequence) ⇒ void

  Unlike the primitive editor<%> method's end-edit-sequence, this will raise an exception when it is called without an matching call to begin-edit-sequence.

`get-file`

Called when the user must be queried for a filename to load an editor. A starting directory string is passed in, but is may be `#f` to indicate that any directory is fine.

- `(send` *an-editor:basic-mixin* `get-file` *directory*`)` ⇒ string
  directory : string or `#f`

  Uses `finder:get-file` to find a filename. Also, sets the parameter `finder:dialog-parent-parameter` to the result of `get-top-level-window`.

`lock`

Locks or unlocks the editor for modifications. If an editor is locked, *all* modifications are blocked, not just user modifications.

See also `is-locked?`.

This method does not affect internal locks, as discussed in section 8.8 (page 153).

- `(send` *an-editor:basic-mixin* `lock` *lock?*`)` ⇒ void
  lock? : boolean

  If *lock?* is `#f`, the editor is unlocked, otherwise it is locked.

  Maintains information for `locked?`.

`on-edit-sequence`

Called just before a top-level (i.e., unnested) edit sequence starts.

During an edit sequence, all callbacks methods are invoked normally, but it may be appropriate for these callbacks to delay computation during an edit sequence. The callbacks must manage this delay manually. Thus, when overriding other callback methods, such as `on-insert` in `text%`, `on-insert` in `pasteboard%`, `after-insert` in `text%`, or `after-insert` in `pasteboard%`, consider overriding `on-edit-sequence` and `after-edit-sequence` as well.

"Top-level edit sequence" refers to an outermost pair of `begin-edit-sequence` and `end-edit-sequence` calls. The embeddeding of an editor within another editor does not affect the timing of calls to `on-edit-sequence`, even if the embedding editor is in an edit sequence.

- `(send` *an-editor:basic-mixin* `on-edit-sequence)` ⇒ boolean

  Always returns `#t`. Updates a flag for `local-edit-sequence?`

`on-focus`

Called when the keyboard focus changes into or out of this editor (and not to/from a snip within the editor) with `#t` if the focus is being turned on, `#f` otherwise.

- `(send` *an-editor:basic-mixin* `on-focus` *on?*`)` ⇒ void
  on? : boolean

`on-new-box`

Creates and returns a new snip for an embedded editor. This method is called by `insert-box`.

- `(send` *an-editor:basic-mixin* `on-new-box` *type*`)` ⇒ (instance `editor-snip%`)
  type : (union 'pasteboard 'text)

  Creates instances of `pasteboard:basic%` or `text:basic%` instead of the built in `pasteboard%` and `text%` classes.

`put-file`

Called when the user must be queried for a filename to save an editor. Starting directory and default name strings are passed in, but either may be `#f` to indicate that any directory is fine or there is no default name.

- `(send` *an-editor:basic-mixin* `put-file` *directory* *default-name*`)` ⇒ string
  directory : string or `#f`
  default-name : string or `#f`

  Uses `finder:put-file` to find a filename. Also, sets the parameter `finder:dialog-parent-parameter` to the result of `get-top-level-window`.

7.3 editor:keymap<%>

Extends: `editor:basic<%>`

Classes matching this interface add support for mixing in multiple keymaps. They provides an extensible interface to chained keymaps, through the @mlink get-keymaps method.

This editor is initialized by calling `add-editor-keymap-functions`, `add-text-keymap-functions`, and `add-pasteboard-keymap-functions`.

`get-keymaps`

The keymaps returned from this method are chained to this `editor<%>`'s keymap.

- `(send` *an-editor:keymap* `get-keymaps``)` ⇒ (list-of (instance `keymap%`))

  Defaultly returns `(list keymap:get-global)`

7.4 editor:keymap-mixin

Domain: `editor:basic<%>`

Implements: `editor:basic<%>`

Implements: `editor:keymap<%>`

This provides a mixin that implements the `editor:keymap<%>` interface.

7.5 editor:autowrap<%>

Extends: editor:basic<%>

Classes implementing this interface keep the the auto-wrap state set based on the 'framework:auto-set-wrap? preference (see section ?? for more info about preferences).

They install a preferences callback with preferences:add-callback that sets the state when the preference changes and initialize the value of auto-wrap to the current value of 'framework:auto-set-wrap? via preferences:get.

7.6 editor:autowrap-mixin

Domain: editor:basic<%>

Implements: editor:basic<%>

Implements: editor:autowrap<%>

See editor:autowrap<%>

on-close

This method is called when a frame that shows this buffer is closed.

- (send *an-editor:autowrap-mixin* on-close) ⇒ void

  Does nothing.

  Removes the preferences callback for 'framework:auto-set-wrap? (which updates the wrapping in this text). It chains to the superclass's method.

7.7 editor:file<%>

Extends: editor:keymap<%>

Objects supporting this interface are expected to support files.

7.8 editor:file-mixin

Domain: editor:keymap<%>

Implements: editor:file<%>

Implements: editor:keymap<%>

This editor locks itself when the file that is opened is read-only in the filesystem.

The class that this mixin produces uses the same initialization arguments as it's input.

`after-load-file`

Called just after the editor is loaded from a file. The argument to the method specifies whether the load was sucessful or not. See also `can-load-file?` and `on-load-file`.

- `(send` *an-editor:file-mixin* `after-load-file)` ⇒ void

  Checks if the newly loaded file is write-only in the filesystem. If so, locks the editor with the `lock` method. Otherwise unlocks the buffer

  For each canvas returned from `get-canvases` it checks to see if the `canvas%`'s `get-top-level-window` matches the `frame:editor<%>` interface. If so, it calls `set-label` with the last part of the filename (ie, the name of the file, not the directory the file is in).

`after-save-file`

Called just after the editor is saved to a file. The argument to the method specifies whether the save was sucessful or not. See also `can-save-file?`and `on-save-file`.

- `(send` *an-editor:file-mixin* `after-save-file)` ⇒ void

  Checks if the newly saved file is write-only in the filesystem. If so, locks the editor with the `lock` method. Otherwise unlocks the buffer

  For each canvas returned from `get-canvases` it checks to see if the `canvas%`'s `get-top-level-window` matches the `frame:editor<%>` interface. If so, it calls `set-label` with the last part of the filename (ie, the name of the file, not the directory the file is in).

`editing-this-file?`

Indicates if the file in this editor is open for editing, or merely for viewing.

- `(send` *an-editor:file-mixin* `editing-this-file?)` ⇒ boolean

  returns `#t`.

`get-keymaps`

The keymaps returned from this method are chained to this `editor<%>`'s keymap.

- `(send` *an-editor:file-mixin* `get-keymaps)` ⇒ (list-of (instance `keymap%`))

  Defaultly returns `(list keymap:get-global)`

  This returns a list containing the super-class's keymaps, plus the result of `keymap:get-file`

`set-filename`

Set the path name for the file to be saved from or reloaded into this editor. This method is also called when the filename changes through any method (such as `load-file`).

The filename of an editor can be changed by the system in response to file loading and saving method calls, and such changes do not go through this method; use `on-load-file` and `on-save-file` to monitor such filename changes.

- (send *an-editor:file-mixin* `set-filename` *name temp?*) ⇒ void
  name : string
  temp? = `#f` : boolean

  Sets the filename to *filename*. If *filename* is `#f` or *temporary?* is a true value, then the user will still be prompted for a name on future calls to `save-file` and `load-file`.

  Updates the filename on each frame displaying this editor, for each frame that matches `frame:editor<%>`.

7.9 editor:backup-autosave<%>

Extends: `editor:basic<%>`

Classes matching this interface support backup files and autosaving.

`autosave?`

Indicates weather this `editor<%>` should be autosaved.

- (send *an-editor:backup-autosave* `autosave?`) ⇒ boolean

  Returns `#t`.

`backup?`

Indicates weather this `editor<%>` should be backed up.

- (send *an-editor:backup-autosave* `backup?`) ⇒ boolean

  Returns `#t`.

`do-autosave`

This method is called to perform the autosaving. See also `autosave:register`

- (send *an-editor:backup-autosave* `do-autosave`) ⇒ void

  When the file has been modified since it was last saved and autosaving it turned on (via the `autosave?` method) an autosave file is created for this `editor<%>`.

`remove-autosave`

This method removes the autosave file associated with this `editor<%>`.

- (send *an-editor:backup-autosave* `remove-autosave`) ⇒ void

7.10 editor:backup-autosave-mixin

Domain: editor:basic<%>

Implements: editor:backup-autosave<%>

Implements: editor:basic<%>

This mixin adds backup and autosave functionality to an editor.

The result of this mixin uses the same initialization arguments as the mixin's argument.

on-change

Called whenever any change is made to the editor that affects the way the editor is drawn or the values reported for the location/size of any snip in the editor. The on-change method is called just before the editor calls its administrator's needs-update method to refresh the editor's display.

The editor is locked for writing and reflowing during the call to on-change.

- (send *an-editor:backup-autosave-mixin* on-change) ⇒ void

  Sets a flag indicating that this editor<%> needs to be autosaved.

on-close

This method is called when a frame that shows this buffer is closed.

- (send *an-editor:backup-autosave-mixin* on-close) ⇒ void

  Does nothing.

  Deletes the autosave file and turns off autosaving.

on-save-file

Called just before the editor is saved to a file, after calling can-save-file? to verify that the save is allowed. See also after-save-file.

- (send *an-editor:backup-autosave-mixin* on-save-file *filename format*) ⇒ bool
  filename : string
  format : symbol in '(guess standard text text-force-cr same copy)

  The *filename* argument is the name the file will be saved to. See load-file for information about *format*.

  If a backup file has not been created this session for this file, deletes any existing backup file and copies the old save file into the backup file. For the backup file's name, see path-utils:generate-backup-name

`set-modified`

Sets the modified state of the editor. Usually, the state is changed automatically after an insertion, deletion, or style change by calling this method. (This method is also called when the modification state changes through *any* method.) This method is usually not called when the state of the flag is not changing.

See also `is-modified?`.

- `(send` *an-editor:backup-autosave-mixin* `set-modified` *modified?*`)` ⇒ void
  modified? : boolean

  Sets the modification state to *modified?*. If *modified?* is `#f` and the editor's undo or redo stack contains a system-created undoer that resets the modified state (because the preceding undo or redo action puts the editor back to a state where the modification state was `#f`), the undoer is disabled.

  If the file is no longer modified, this method deletes the autosave file. If it is, it updates a flag to indicate that the autosave file is out of date.

7.11 editor:info<%>

Extends: `editor:basic<%>`

An `editor<%>` matching this interface provides information about its lock state to its `top-level-window<%>`.

7.12 editor:info-mixin

Domain: `editor:basic<%>`

Implements: `editor:basic<%>`

Implements: `editor:info<%>`

This editor tells the frame when it is locked and unlocked. See also `frame:text-info<%>`.

`lock`

Locks or unlocks the editor for modifications. If an editor is locked, *all* modifications are blocked, not just user modifications.

See also `is-locked?`.

This method does not affect internal locks, as discussed in section 8.8 (page 153).

- `(send` *an-editor:info-mixin* `lock` *lock?*`)` ⇒ void
  lock? : boolean

  If *lock?* is `#f`, the editor is unlocked, otherwise it is locked.

  Uses `run-after-edit-sequence` to call `lock-status-changed`.

8. Exit

The exiting library provides a way to perform cleanup actions when the application is quit.

Clean up actions can be installed by registering a callback procedure that will be invoked by `exit:exit`.

On exit, *callback* will be called with no arguments. Also, use `exit:insert-on-callback`:

`(exit:insert-on-callback` *callback*`)`

to perform cleanup actions.

Also, callbacks can be registered that abort exiting. To install such a a callback, use `exit:insert-can?-callback`:

`(exit:insert-can?-callback` *callback*`)`

if *callback* returns `#f`, then the exit is aborted.

8.1 Exit Utilities

`exit:can-exit?`

Calls the "can-callbacks". See `exit:insert-can?-callback` for more information.

- `(exit:can-exit?)` ⇒ void

`exit:exit`

exit:exit performs three actions:

- If the preference `'framework:verify-exit` is not `#f`, it prompts the user about quiting (see section **??** for more info about preferences), and if the user sanctions quiting (or if the preference is `#f`), it
- invokes the exit-callbacks, with `exit:can-exit?`If none of the "can?" callbacks return `#f`, it invokes `exit:on-exit`and then `exit` (a mzscheme procedure).

- `(exit:exit)` ⇒ (void)

`exit:frame-exiting`

This is a parameter whose value is used as the parent of the "Are you sure you want to exit" dialog.

- (`exit:frame-exiting` *frame*) ⇒ void
  frame : (union #f (instance `frame%`) (instance `dialog%`)

  sets the value of the parameter to *frame*.

- (`exit:frame-exiting`) ⇒ (union #f (instance `frame%`) (instance `dialog%`)

  returns the current value of the parameter.

`exit:insert-can?-callback`

Use this function to add a callback that determines if an attempted exit can proceed. This callback should not clean up any state, since another callback may veto the exit. Use `exit:insert-on-callback` for callbacks that clean up state.

- (`exit:insert-can?-callback` *callback*) ⇒ void
  callback : (-¿ boolean)

`exit:insert-on-callback`

Adds a callback to be called when exiting. This callback must not fail. If a callback should stop an exit from happening, use `exit:insert-can?-callback%`.

- (`exit:insert-on-callback` *callback*) ⇒ void
  callback : (-¿ void)

`exit:on-exit`

Calls the "on-callbacks". See `exit:insert-on-callback` for more information.

- (`exit:on-exit`) ⇒ void

9. Exceptions

10. Finder

The procedures `finder:get-file` and `finder:put-file` query the user for a filename; `finder:get-file` gets the name of an existing file, and `finder:put-file` gets the name for a new file.

Under Windows and MacOS, `finder:get-file` and `finder:put-file` call `finder:std-get-file` and `finder:std-put-file`, which implement the filename query using platform-specific dialogs. Under Unix, `finder:get-file` and `finder:put-file` call `finder:common-get-file` and `finder:common-put-file` which use a platform-independent dialog. Which procedure `finder:get-file` and `finder:put-file` call depends on the value of the preference (see section **??** for more info about preferences) `'framework:file-dialogs`. It it is `'common`, the common platform-independent dialogs are used and if it is `'std`, the standard platform-specific dialogs are used.

The `finder:common-get-file` and `finder:common-put-file` dialogs keep a separate directory state (for starting in the same place as the previous dialog ended); this directory can be obtained and set with the procedure `finder:current-find-file-directory`.

The procedure `finder:common-get-file-list` gets a list of filenames from the user using a platform-independent dialog. The arguments are the same as for `finder:get-file` and the result is either `#f` or a list of filenames.

All filenames returned by these procedures are normalized using `normalize-path` from mzlib's file utilities, section 15.2.10.

10.1 Finder Utilities

`finder:common-get-file`

This procedure queries the user for a single filename, using a platform-independent dialog box. Consider using `finder:get-file` instead of this function.

See section 10 for more information.

- (`finder:common-get-file` *directory prompt filter filter-msg parent*) ⇒ string or #f
  directory = `null` : string or `null`
  prompt = `"Select File"` : string
  filter = `#f` : a regular expression or `#f`
  filter-msg = `"That filename does not have the right form."` : string
  parent = `null` : `top-level-window<%>`

`finder:common-get-file-list`

This procedure queries the user for a list of filenames, using a platform-independent dialog box.

See section 10 for more information.

- (finder:common-get-file-list *directory prompt filter filter-msg parent*) ⇒ (union (listof string) #f)
  directory = null : (union null string)
  prompt = "Select File" : string
  filter = #f : #f or a regular expression
  filter-msg = "That filename does not have the right form." : string
  parent = #f : (union #f (instance top-level-window<%>))

finder:common-put-file

This procedure queries the user for a single filename, using a platform-independent dialog box. Consider using finder:put-file instead of this function.

See section 10 for more information.

- (finder:common-put-file *name directory replace? prompt filter filter-msg parent*) ⇒ (union #f string)
  name = "Untitled" : string
  directory = null : (union #f string)
  replace? = #f : bool
  prompt = "Select File" : string
  filter = #f : (union #f regexp)
  filter-msg = "That filename does not have the right form." : string
  parent = (finder:dialog-parent-parameter) : (union (instance top-level-window<%>) #f)

finder:current-find-file-directory

This is a parameterof the MzScheme manualmz:parameters that specifies the parent for any of the dialogs created with: finder:std-get-file, finder:std-put-file, finder:common-get-file-list, finder:common-get-file, or finder:common-put-file.

- (finder:current-find-file-directory) ⇒ (instance top-level-window<%>)

  Returns the current value of the parameter.

- (finder:current-find-file-directory *top-level-window*) ⇒ void
  top-level-window : (instance top-level-window<%>)

  Sets the parameter to *top-level-window*

finder:default-extension

This function is used to hold the state for the file dialogs under windows. The extension supplied will be used if the user does not supply an extension for the filename.

- (finder:default-extension *ext*) ⇒ void
  ext : string

  Sets the default extension to *ext*

- (finder:default-extension) ⇒ string

  Returns the default extension.

`finder:dialog-parent-parameter`

This is a parameter)mz:parameters which determines the parent of the dialogs created by `finder:get-file`, `finder:put-file`, `finder:common-get-file`, `finder:common-put-file`, `finder:common-get-file-list`, `finder:std-get-file`, and `finder:std-put-file`.

- `(finder:dialog-parent-parameter)` ⇒ (union (instance `top-level-window<%>`) #f)
  Returns the current value of the parameter.

`finder:get-file`

Queries the user for a filename.

- `(finder:get-file` *directory prompt filter filter-msg parent*`)` ⇒ (union string #f)
  directory = `#f` : (union string #f)
  prompt = `"Select File"` : string
  filter = `#f` : (union regexp #f)
  filter-msg = `"That filename does not have the right form."` : string
  parent = `(finder:dialog-parent-parameter)` : (union (instance `top-level-window<%>`) #f)
  If the result of `(preferences:get 'framework:file-dialogs)` is `'std` this calls `finder:std-get-file`, and if it is `'common`, `finder:common-get-file` is called.

`finder:put-file`

Queries the user for a filename.

- `(finder:put-file` *name directory replace? prompt filter filter-msg parent*`)` ⇒ (union string #f)
  name = `"Untitled"` : string
  directory = `#f` : (union #f string)
  replace? = `#f` : bool
  prompt = `"Select File"` : string
  filter = `#f` : (union #f regexp)
  filter-msg = `"That filename does not have the right form."` : string
  parent = `(finder:dialog-parent-parameter)` : (union (instance `top-level-window<%>`) #f)
  If the result of `(preferences:get 'framework:file-dialogs)` is `'std` this calls `finder:std-put-file`, and if it is `'common`, `finder:common-put-file` is called.

`finder:std-get-file`

This procedure queries the user for a single filename, using a platform-dependent dialog box. Consider using `finder:get-file` instead of this function.

See section 10 for more information.

- `(finder:std-get-file` *directory prompt filter filter-msg parent*`)` ⇒ string or #f
  directory = `#f` : (union #f string)
  prompt = `"Select File"` : string
  filter = `#f` : (union regexp #f)
  filter-msg = `"That filename does not have the right form."` : string
  parent = `(finder:dialog-parent-parameter)` : (union (instance `top-level-window<%>`) #f)

`finder:std-put-file`

This procedure queries the user for a single filename, using a platform-dependent dialog box. Consider using `finder:put-file` instead of this function.

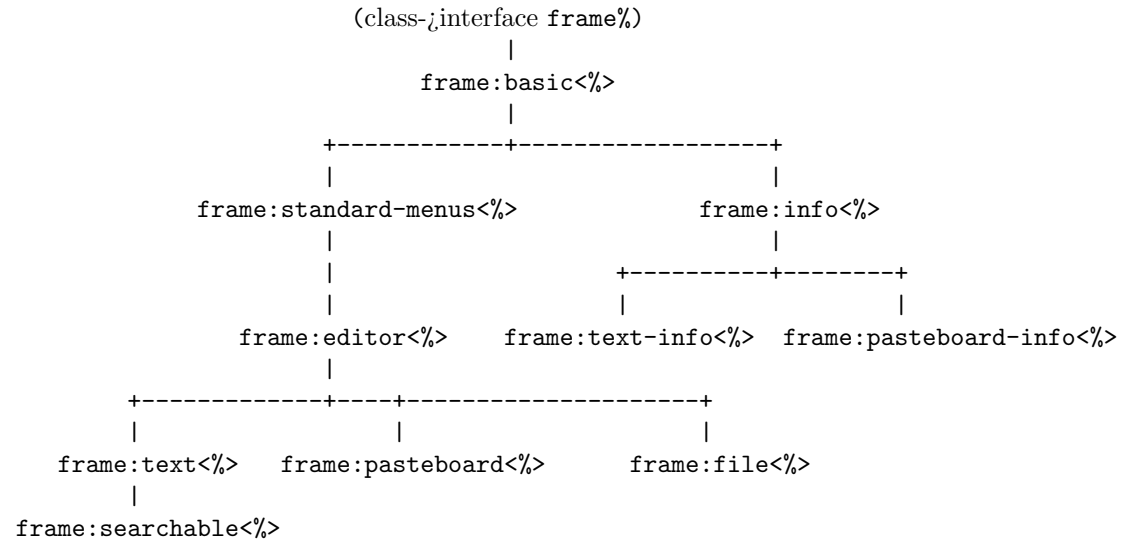
See section 10 for more information.

- (`finder:std-put-file` *name directory replace? prompt filter filter-msg parent*) ⇒ string or #f
  name = `"Untitled"` : string
  directory = `#f` : (union #f string)
  replace? = `#f` : bool
  prompt = `"Select File"` : string
  filter = `#f` : (union `#f` regexp)
  filter-msg = `"That filename does not have the right form."` : string
  parent = (`finder:dialog-parent-parameter`) : (union (instance `top-level-window<%>`) #f)

11. Frame

This chapter describes the frame mixins, interfaces, and classes.

This is the interface hierarchy:



11.1 frame:basic<%>

Extends: `(class->interface frame%)`

Classes matching this interface support the basic `frame%` functionality required by the framework.

`close`

This method closes the frame by calling the `can-close?`, `on-close`, and `show` methods.

It's implementation is:

```
(inherit can-close? on-close)
(public
  [show
    (lambda ()
      (when (can-close?)
        (on-close)
        (show #f)))])
```

- `(send` *a-frame:basic* `close)` ⇒ void

`get-area-container`

This returns the main `area-container<%>` in the frame

- `(send` *a-frame:basic* `get-area-container)` ⇒ (instance (implements `area-container<%>`))

`get-area-container%`

The class that this method returns is used to create the `area-container<%>` in this frame.

- `(send` *a-frame:basic* `get-area-container%)` ⇒ (implements `area-container<%>`)

`get-filename`

This returns the filename that the frame is currently being saved as, or `#f` if there is no appropriate filename.

- `(send` *a-frame:basic* `get-filename` *temp*`)` ⇒ (union #f string)
  temp = `#f` : (union #f (box boolean))

  Defaultly returns `#f`.

  If *temp* is a box, it is filled with `#t` or `#f`, depending if the filename is a temporary filename.

`get-menu-bar%`

The result of this method is used to create the initial menu bar for this frame.

- `(send` *a-frame:basic* `get-menu-bar%)` ⇒ (derived-from `menu-bar%`)

  Return `menu-bar%`.

`make-root-area-container`

Override this method to insert a panel in between the panel used by the clients of this frame and the frame itself. For example, to insert a status line panel override this method with something like this:

```
  ...
 (rename [super-make-root-area-container make-root-area-container])
 (private
   [status-panel #f])
 (override
   [make-root-area-container
    (lambda (class parent)
      (set! status-panel
            (super-make-root-area-container
               vertical-panel%
               parent))
      (let* ([root (make-object class status-panel)])

        ; ... add other children to status-panel ...
```

```
        root))])
  ...
```

In this example, status-panel will contain a root panel for the other classes, and whatever panels are needed to display status information.

The searching frame is implemented using this method.

- (`send` *a-frame:basic* `make-root-area-container` *class parent*) ⇒ (instance (implements `area-container<%>`))
  class : (implements `area-container<%>`)
  parent : (instance (implements `area-container<%>`))

  Calls `make-object` with *class* and *parent*.

11.2 `frame:basic-mixin`

Domain: `(class->interface frame%)`

Implements: `frame:basic<%>`

This mixin provides the basic functionality that the framework expects. It helps manage the list of frames in the `group:%` object returned by `group:get-the-frame-group`.

Do not give `panel%`s or `control<%>`s this frame as parent. Instead, use the result of the `get-area-container` method.

- (`make-object frame:basic-mixin%` *label parent width height x y style*) ⇒ `frame:basic-mixin%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

- 'no-resize-border — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- 'no-caption — omits the title bar for the frame (Windows)
- 'no-system-menu — omits the system menu (Windows)
- 'mdi-child — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with 'mdi-parent (Windows)
- 'mdi-parent — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with 'mdi-child (Windows)

If the 'mdi-child style is specified, the *parent* must be a frame with the 'mdi-parent style, otherwise an exn:application:mismatch exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

after-new-child

This method is called after a new containee area is created with this area as its container. The new child is provided as an argument to the method.

- (send *a-frame:basic-mixin* after-new-child) ⇒ void

  Raises an exception if attempting to add a child to this frame (except if using the make-root-area-container method).

can-close?

Called just before the window might be closed (e.g., by the window manager). If #f is returned, the window is not closed, otherwise on-close is called and the window is closed (i.e., the window is hidden, like calling show with #f).

This method is *not* called by show .

- (send *a-frame:basic-mixin* can-close?) ⇒ bool

  Calls the method can-remove-frame? of group:get-the-frame-group.

on-close

Called just before the window is closed (e.g., by the window manager). This method is *not* called by show .

See also can-close?.

- (send *a-frame:basic-mixin* on-close) ⇒ void

  calls the remove-frame method of the result of group:get-the-frame-group.

on-drop-file

For platforms that support drag-and-drop, this method is called when the user drags a file onto the window. Drag-and-drop must first be enabled for the window with accept-drop-files.

Under MacOS, when the user double-clicks on a MrEd file or drags a file onto the MrEd icon, the on-drop-file method of the frontmost frame is called (if drag-and-drop is enabled for that frame).

- (send *a-frame:basic-mixin* `on-drop-file` *pathname*) ⇒ void
  pathname : string

  Calls `handler:edit-file` with *pathname* as an argument.

`on-focus`

Called when a window receives or loses the keyboard focus. If the argument is `#t`, the keyboard focus was received, otherwise it was lost.

Note that under X, keyboard focus can move to the menu bar when the user is selecting a menu item.

- (send *a-frame:basic-mixin* `on-focus` *on?*) ⇒ void
  on? : boolean

  Does nothing.

  Calls `set-active-frame` with `this`.

11.3 `frame:info<%>`

Extends: `frame:basic<%>`

Frames matching this interface support a status line.

`determine-width`

This method is used to calculate the size of an `editor-canvas%` with a particular set of characters in it. It is used to calculate the sizes of the edits in the status line.

- (send *a-frame:info* `determine-width` *str canvas text*) ⇒ integer
  str : string
  canvas : (instance `editor-canvas%`)
  text : (instance `text%`)

`get-info-canvas`

Returns the canvas that the `frame:info<%>` currently shows info about. See also `set-info-canvas`

- (send *a-frame:info* `get-info-canvas`) ⇒ (instance `canvas:basic%`)

`get-info-editor`

Override this method to specify the editor that the status line contains information about.

- (send *a-frame:info* `get-info-editor`) ⇒ (union #f (implements `editor<%>`))

  Returns the result of `get-editor`.

`get-info-panel`

This method returns the panel where the information about this editor is displayed.

- (send *a-frame:info* `get-info-panel`) ⇒ (instance `horizontal-panel%`)

`lock-status-changed`

This method is called when the lock status of the `editor<%>` changes.

- (send *a-frame:info* `lock-status-changed`) ⇒ void

  Updates the lock icon in the status line panel.

`set-info-canvas`

Sets this canvas to be the canvas that the info frame shows info about. The `on-focus` and `set-editor` methods call this method to ensure that the info canvas is set correctly.

- (send *a-frame:info* `set-info-canvas` *canvas*) ⇒ void
  canvas : (instance `canvas:basic%`)

`update-info`

This method updates all of the information in the panel.

- (send *a-frame:info* `update-info`) ⇒ void

11.4 `frame:info-mixin`

Domain: `frame:basic<%>`

Implements: `frame:info<%>`

Implements: `frame:basic<%>`

This mixin provides support for dispaying various info in the status line of the frame.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`make-root-area-container`

Override this method to insert a panel in between the panel used by the clients of this frame and the frame itself. For example, to insert a status line panel override this method with something like this:

```
  ...
 (rename [super-make-root-area-container make-root-area-container])
 (private
```

```
   [status-panel #f])
 (override
   [make-root-area-container
    (lambda (class parent)
      (set! status-panel
            (super-make-root-area-container
               vertical-panel%
               parent))
      (let* ([root (make-object class status-panel)])

        ; ... add other children to status-panel ...

        root))])
  ...
```

In this example, status-panel will contain a root panel for the other classes, and whatever panels are needed to display status information.

The searching frame is implemented using this method.

- `(send` *a-frame:info-mixin* `make-root-area-container` *class parent*`)` ⇒ (instance `area-container<%>`)
  class : (implements `area-container<%>`)
  parent : (instance (implements `area-container<%>`))

  Calls `make-object` with *class* and *parent*.

  Builds an extra panel for displaying various information.

`on-close`

Called just before the window is closed (e.g., by the window manager). This method is *not* called by `show` .

See also `can-close?`.

- `(send` *a-frame:info-mixin* `on-close``)` ⇒ void

  Removes the gc icon with `unregister-collecting-blit` and cleans up other callbacks.

11.5 `frame:text-info<%>`

Extends: `frame:info<%>`

Objects matching this interface receive information from editors constructed with `editor:info-mixin` and display it.

`anchor-status-changed`

This method is called when the anchor is turned either on or off in the `editor<%>` in this frame.

- `(send` *a-frame:text-info* `anchor-status-changed``)` ⇒ void

`editor-position-changed`

This method is called when the position in the `editor<%>` changes.

- `(send` *a-frame:text-info* `editor-position-changed)` ⇒ void

`overwrite-status-changed`

This method is called when the overwrite mode is turned either on or off in the `editor<%>` in this frame.

- `(send` *a-frame:text-info* `overwrite-status-changed)` ⇒ void

11.6 `frame:text-info-mixin`

Domain: `frame:info<%>`

Implements: `frame:text-info<%>`

Implements: `frame:info<%>`

This mixin adds status information to the info panel relating to an edit.

`on-close`

Called just before the window is closed (e.g., by the window manager). This method is *not* called by `show` .

See also `can-close?`.

- `(send` *a-frame:text-info-mixin* `on-close)` ⇒ void

  removes a preferences callback for `'framework:line-offsets`. See the preferences sectionpreferences for more information

`update-info`

This method updates all of the information in the panel.

- `(send` *a-frame:text-info-mixin* `update-info)` ⇒ void

  Calls `overwrite-status-changed`, `anchor-status-changed`, and `editor-position-changed`.

11.7 `frame:pasteboard-info<%>`

Extends: `frame:info<%>`

11.8 `frame:pasteboard-info-mixin`

Domain: `frame:basic<%>`

Implements: `frame:pasteboard-info<%>`

Implements: `frame:basic<%>`

11.9 `frame:standard-menus<%>`

Extends: `frame:basic<%>`

Classes matching this interface provides a skeleton for the standard set of menus in a frame.

The available methods, listed in order the appear in the menus, is:

- `file-menu:new`, `file-menu:new-string`, `file-menu:new-help-string`, `file-menu:new-on-demand`, `file-menu:get-new-item`
- `file-menu:between-new-and-open`
- `file-menu:open`, `file-menu:open-string`, `file-menu:open-help-string`, `file-menu:open-on-demand`, `file-menu:get-open-item`
- `file-menu:between-open-and-revert`
- `file-menu:revert`, `file-menu:revert-string`, `file-menu:revert-help-string`, `file-menu:revert-on-demand`, `file-menu:get-revert-item`
- `file-menu:between-revert-and-save`
- `file-menu:save`, `file-menu:save-string`, `file-menu:save-help-string`, `file-menu:save-on-demand`, `file-menu:get-save-item`
- `file-menu:save-as`, `file-menu:save-as-string`, `file-menu:save-as-help-string`, `file-menu:save-as-on-demar` `file-menu:get-save-as-item`
- `file-menu:between-save-as-and-print`
- `file-menu:print`, `file-menu:print-string`, `file-menu:print-help-string`, `file-menu:print-on-demand`, `file-menu:get-print-item`
- `file-menu:between-print-and-close`
- `file-menu:close`, `file-menu:close-string`, `file-menu:close-help-string`, `file-menu:close-on-demand`, `file-menu:get-close-item`
- `file-menu:between-close-and-quit`
- `file-menu:quit`, `file-menu:quit-string`, `file-menu:quit-help-string`, `file-menu:quit-on-demand`, `file-menu:get-quit-item`
- `file-menu:after-quit`

- `edit-menu:undo`, `edit-menu:undo-string`, `edit-menu:undo-help-string`, `edit-menu:undo-on-demand`, `edit-menu:get-undo-item`
- `edit-menu:redo`, `edit-menu:redo-string`, `edit-menu:redo-help-string`, `edit-menu:redo-on-demand`, `edit-menu:get-redo-item`
- `edit-menu:between-redo-and-cut`
- `edit-menu:cut`, `edit-menu:cut-string`, `edit-menu:cut-help-string`, `edit-menu:cut-on-demand`, `edit-menu:get-cut-item`
- `edit-menu:between-cut-and-copy`
- `edit-menu:copy`, `edit-menu:copy-string`, `edit-menu:copy-help-string`, `edit-menu:copy-on-demand`, `edit-menu:get-copy-item`
- `edit-menu:between-copy-and-paste`
- `edit-menu:paste`, `edit-menu:paste-string`, `edit-menu:paste-help-string`, `edit-menu:paste-on-demand`, `edit-menu:get-paste-item`
- `edit-menu:between-paste-and-clear`
- `edit-menu:clear`, `edit-menu:clear-string`, `edit-menu:clear-help-string`, `edit-menu:clear-on-demand`, `edit-menu:get-clear-item`
- `edit-menu:between-clear-and-select-all`
- `edit-menu:select-all`, `edit-menu:select-all-string`, `edit-menu:select-all-help-string`, `edit-menu:select-all-on-demand`, `edit-menu:get-select-all-item`
- `edit-menu:between-select-all-and-find`
- `edit-menu:find`, `edit-menu:find-string`, `edit-menu:find-help-string`, `edit-menu:find-on-demand`, `edit-menu:get-find-item`
- `edit-menu:find-again`, `edit-menu:find-again-string`, `edit-menu:find-again-help-string`, `edit-menu:find-again-on-demand`, `edit-menu:get-find-again-item`
- `edit-menu:replace-and-find-again`, `edit-menu:replace-and-find-again-string`, `edit-menu:replace-and-find` `edit-menu:replace-and-find-again-on-demand`, `edit-menu:get-replace-and-find-again-item`
- `edit-menu:between-find-and-preferences`
- `edit-menu:preferences`, `edit-menu:preferences-string`, `edit-menu:preferences-help-string`, `edit-menu:preferences-on-demand`, `edit-menu:get-preferences-item`
- `edit-menu:after-preferences`
- `help-menu:before-about`
- `help-menu:about`, `help-menu:about-string`, `help-menu:about-help-string`, `help-menu:about-on-demand`, `help-menu:get-about-item`
- `help-menu:after-about`

`edit-menu:after-preferences`

This method is called after the addition of the preferences menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `edit-menu:after-preferences` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`edit-menu:between-clear-and-select-all`

This method is called between the addition of the clear menu-item and before the addition of the select-all menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `edit-menu:between-clear-and-select-all` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`edit-menu:between-copy-and-paste`

This method is called between the addition of the copy menu-item and before the addition of the paste menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `edit-menu:between-copy-and-paste` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`edit-menu:between-cut-and-copy`

This method is called between the addition of the cut menu-item and before the addition of the copy menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `edit-menu:between-cut-and-copy` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`edit-menu:between-find-and-preferences`

This method is called between the addition of the find menu-item and before the addition of the preferences menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `edit-menu:between-find-and-preferences` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Adds a separator menu item.

`edit-menu:between-paste-and-clear`

This method is called between the addition of the paste menu-item and before the addition of the clear menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `edit-menu:between-paste-and-clear` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`edit-menu:between-redo-and-cut`

This method is called between the addition of the redo menu-item and before the addition of the cut menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `edit-menu:between-redo-and-cut` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Adds a separator menu item.

`edit-menu:between-select-all-and-find`

This method is called between the addition of the select-all menu-item and before the addition of the find menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `edit-menu:between-select-all-and-find` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Adds a separator menu item.

`edit-menu:clear`

This method is called when the clear menu-item of the edit-menu menu is selected. If edit-menu:clear is bound to `#f` instead of a procedure, the clear menu item will not be created.

- (send *a-frame:standard-menus* `edit-menu:clear` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:clear-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `edit-menu:clear-help-string`) ⇒ string

  Defaultly returns "`Clear the selection without affecting paste`"

`edit-menu:clear-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:clear-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:clear-string`

The result of this method is used to construct the name of this menu. It is inserted between "`(if (eq? (system-type) (quote macos)) Clear &Delete)`" and "" to form the complete name

- `(send` *a-frame:standard-menus* `edit-menu:clear-string)` ⇒ string

`edit-menu:copy`

This method is called when the copy menu-item of the edit-menu menu is selected. If edit-menu:copy is bound to `#f` instead of a procedure, the copy menu item will not be created.

- `(send` *a-frame:standard-menus* `edit-menu:copy` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:copy-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- `(send` *a-frame:standard-menus* `edit-menu:copy-help-string)` ⇒ string

  Defaultly returns "`Copy the selection`"

`edit-menu:copy-on-demand`

The menu item's on-demand method calls this method

- `(send` *a-frame:standard-menus* `edit-menu:copy-on-demand` *item*`)` ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:copy-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Copy`" and "" to form the complete name

- `(send` *a-frame:standard-menus* `edit-menu:copy-string)` ⇒ string

`edit-menu:cut`

This method is called when the cut menu-item of the edit-menu menu is selected. If edit-menu:cut is bound to `#f` instead of a procedure, the cut menu item will not be created.

- (send *a-frame:standard-menus* `edit-menu:cut` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:cut-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `edit-menu:cut-help-string`) ⇒ string

  Defaultly returns "`Cut the selection`"

`edit-menu:cut-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:cut-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:cut-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Cu&t`" and "" to form the complete name

- (send *a-frame:standard-menus* `edit-menu:cut-string`) ⇒ string

`edit-menu:find`

This method is called when the find menu-item of the edit-menu menu is selected. If edit-menu:find is bound to `#f` instead of a procedure, the find menu item will not be created.

- (send *a-frame:standard-menus* `edit-menu:find` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
#f
```

`edit-menu:find-again`

This method is called when the find-again menu-item of the edit-menu menu is selected. If edit-menu:find-again is bound to `#f` instead of a procedure, the find-again menu item will not be created.

- (`send` *a-frame:standard-menus* `edit-menu:find-again` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  #f
  ```

`edit-menu:find-again-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `edit-menu:find-again-help-string`) ⇒ string

  Defaultly returns "`Search for the same string as before`"

`edit-menu:find-again-on-demand`

The menu item's on-demand method calls this method

- (`send` *a-frame:standard-menus* `edit-menu:find-again-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

  ```
  (lambda (item) (send item enable (let ((target (get-edit-target-object))) (and target (is-a?  tar
  ```

`edit-menu:find-again-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Find Again`" and "" to form the complete name

- (`send` *a-frame:standard-menus* `edit-menu:find-again-string`) ⇒ string

`edit-menu:find-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `edit-menu:find-help-string`) ⇒ string

  Defaultly returns "`Search for a string in the window`"

`edit-menu:find-on-demand`

The menu item's on-demand method calls this method

- `(send` *a-frame:standard-menus* `edit-menu:find-on-demand` *item*`)` ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (send item enable (let ((target (get-edit-target-object))) (and target (is-a?  tar
```

`edit-menu:find-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Find`" and "`...`" to form the complete name

- `(send` *a-frame:standard-menus* `edit-menu:find-string)` ⇒ string

`edit-menu:get-clear-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-clear-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-copy-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-copy-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-cut-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-cut-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-find-again-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-find-again-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-find-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-find-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-paste-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-paste-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-preferences-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-preferences-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-redo-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-redo-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-replace-and-find-again-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-replace-and-find-again-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-select-all-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-select-all-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:get-undo-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `edit-menu:get-undo-item)` ⇒ (instance iscmclasmenu-item)

`edit-menu:paste`

This method is called when the paste menu-item of the edit-menu menu is selected. If edit-menu:paste is bound to `#f` instead of a procedure, the paste menu item will not be created.

- `(send` *a-frame:standard-menus* `edit-menu:paste` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)
  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:paste-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- `(send` *a-frame:standard-menus* `edit-menu:paste-help-string)` ⇒ string
  Defaultly returns "`Paste the most recent copy or cut over the selection`"

`edit-menu:paste-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:paste-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:paste-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Paste`" and "" to form the complete name

- (send *a-frame:standard-menus* `edit-menu:paste-string`) ⇒ string

`edit-menu:preferences`

This method is called when the preferences menu-item of the edit-menu menu is selected. If edit-menu:preferences is bound to `#f` instead of a procedure, the preferences menu item will not be created.

- (send *a-frame:standard-menus* `edit-menu:preferences` *item* *evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (item control) (preferences:show-dialog) #t)
```

`edit-menu:preferences-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `edit-menu:preferences-help-string`) ⇒ string

  Defaultly returns "`Configure the preferences`"

`edit-menu:preferences-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:preferences-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
void
```

`edit-menu:preferences-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Preferences...`" and "" to form the complete name

- (`send` *a-frame:standard-menus* `edit-menu:preferences-string`) ⇒ string

`edit-menu:redo`

This method is called when the redo menu-item of the edit-menu menu is selected. If edit-menu:redo is bound to `#f` instead of a procedure, the redo menu item will not be created.

- (`send` *a-frame:standard-menus* `edit-menu:redo` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:redo-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `edit-menu:redo-help-string`) ⇒ string

  Defaultly returns "`Redo the most recent undo`"

`edit-menu:redo-on-demand`

The menu item's on-demand method calls this method

- (`send` *a-frame:standard-menus* `edit-menu:redo-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:redo-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Redo`" and "" to form the complete name

- (`send` *a-frame:standard-menus* `edit-menu:redo-string`) ⇒ string

`edit-menu:replace-and-find-again`

This method is called when the replace-and-find-again menu-item of the edit-menu menu is selected. If edit-menu:replace-and-find-again is bound to `#f` instead of a procedure, the replace-and-find-again menu item will not be created.

- (send *a-frame:standard-menus* edit-menu:replace-and-find-again *item evt*) ⇒ void
  item : (instance (derived-from menu-item%))
  evt : (instance control-event%)

  Defaultly bound to:

```
#f
```

edit-menu:replace-and-find-again-help-string

This result of this method is used as the help string when the menu-item% object is created.

- (send *a-frame:standard-menus* edit-menu:replace-and-find-again-help-string) ⇒ string

  Defaultly returns "Replace the current text and search for the same string as before"

edit-menu:replace-and-find-again-on-demand

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* edit-menu:replace-and-find-again-on-demand *item*) ⇒ void
  item : menu-item%

  Defaultly is this:

```
(lambda (item) (send item enable (let ((target (get-edit-target-object))) (and target (is-a?  tar
```

edit-menu:replace-and-find-again-string

The result of this method is used to construct the name of this menu. It is inserted between "Replace && Find Again" and "" to form the complete name

- (send *a-frame:standard-menus* edit-menu:replace-and-find-again-string) ⇒ string

edit-menu:select-all

This method is called when the select-all menu-item of the edit-menu menu is selected. If edit-menu:select-all is bound to #f instead of a procedure, the select-all menu item will not be created.

- (send *a-frame:standard-menus* edit-menu:select-all *item evt*) ⇒ void
  item : (instance (derived-from menu-item%))
  evt : (instance control-event%)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

edit-menu:select-all-help-string

This result of this method is used as the help string when the menu-item% object is created.

- (send *a-frame:standard-menus* edit-menu:select-all-help-string) ⇒ string

  Defaultly returns "Select the entire document"

`edit-menu:select-all-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:select-all-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:select-all-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Select A&ll`" and "" to form the complete name

- (send *a-frame:standard-menus* `edit-menu:select-all-string`) ⇒ string

`edit-menu:undo`

This method is called when the undo menu-item of the edit-menu menu is selected. If edit-menu:undo is bound to `#f` instead of a procedure, the undo menu item will not be created.

- (send *a-frame:standard-menus* `edit-menu:undo` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (menu evt) (let ((edit (get-edit-target-object))) (when (and edit (is-a?  edit editor<%>)
```

`edit-menu:undo-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `edit-menu:undo-help-string`) ⇒ string

  Defaultly returns "`Undo the most recent action`"

`edit-menu:undo-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `edit-menu:undo-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
(lambda (item) (let* ((editor (get-edit-target-object)) (enable?  (and editor (is-a?  editor edit
```

`edit-menu:undo-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Undo`" and "" to form the complete name

- (`send` *a-frame:standard-menus* `edit-menu:undo-string`) ⇒ string

`file-menu:after-quit`

This method is called after the addition of the quit menu-item to the file-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `file-menu:after-quit` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`file-menu:between-close-and-quit`

This method is called between the addition of the close menu-item and before the addition of the quit menu-item to the file-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `file-menu:between-close-and-quit` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`file-menu:between-new-and-open`

This method is called between the addition of the new menu-item and before the addition of the open menu-item to the file-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `file-menu:between-new-and-open` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`file-menu:between-open-and-revert`

This method is called between the addition of the open menu-item and before the addition of the revert menu-item to the file-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:standard-menus* `file-menu:between-open-and-revert` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`file-menu:between-print-and-close`

This method is called between the addition of the print menu-item and before the addition of the close menu-item to the file-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `file-menu:between-print-and-close` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Adds a separator menu item.

`file-menu:between-revert-and-save`

This method is called between the addition of the revert menu-item and before the addition of the save menu-item to the file-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `file-menu:between-revert-and-save` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`file-menu:between-save-as-and-print`

This method is called between the addition of the save-as menu-item and before the addition of the print menu-item to the file-menu menu. Override it to add additional menus at that point.

- (send *a-frame:standard-menus* `file-menu:between-save-as-and-print` *menu*) ⇒ void
  menu : (instance (derived-from `menu%`))

  Adds a separator menu item.

`file-menu:close`

This method is called when the close menu-item of the file-menu menu is selected. If file-menu:close is bound to `#f` instead of a procedure, the close menu item will not be created.

- (send *a-frame:standard-menus* `file-menu:close` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (item control) (when (can-close?)  (on-close) (show #f)) #t)
```

`file-menu:close-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `file-menu:close-help-string`) ⇒ string

  Defaultly returns "`Close this file`"

`file-menu:close-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `file-menu:close-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

void

file-menu:close-string

The result of this method is used to construct the name of this menu. It is inserted between "&Close" and "" to form the complete name

- (send *a-frame:standard-menus* file-menu:close-string) ⇒ string

file-menu:get-close-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-close-item) ⇒ (instance iscmclasmenu-item)

file-menu:get-new-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-new-item) ⇒ (instance iscmclasmenu-item)

file-menu:get-open-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-open-item) ⇒ (instance iscmclasmenu-item)

file-menu:get-print-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-print-item) ⇒ (instance iscmclasmenu-item)

file-menu:get-quit-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-quit-item) ⇒ (instance iscmclasmenu-item)

file-menu:get-revert-item

This method returns the iscmclassmenu-item that corresponds to this menu item.

- (send *a-frame:standard-menus* file-menu:get-revert-item) ⇒ (instance iscmclasmenu-item)

`file-menu:get-save-as-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `file-menu:get-save-as-item)` ⇒ (instance iscmclasmenu-item)

`file-menu:get-save-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `file-menu:get-save-item)` ⇒ (instance iscmclasmenu-item)

`file-menu:new`

This method is called when the new menu-item of the file-menu menu is selected. If file-menu:new is bound to `#f` instead of a procedure, the new menu item will not be created.

- `(send` *a-frame:standard-menus* `file-menu:new` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)
  Defaultly bound to:

  ```
  (lambda (item control) (handler:edit-file #f) #t)
  ```

`file-menu:new-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- `(send` *a-frame:standard-menus* `file-menu:new-help-string)` ⇒ string
  Defaultly returns "`Open a new file`"

`file-menu:new-on-demand`

The menu item's on-demand method calls this method

- `(send` *a-frame:standard-menus* `file-menu:new-on-demand` *item*`)` ⇒ void
  item : `menu-item%`
  Defaultly is this:

  ```
  void
  ```

`file-menu:new-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&New`" and "" to form the complete name

- `(send` *a-frame:standard-menus* `file-menu:new-string)` ⇒ string

`file-menu:open`

This method is called when the open menu-item of the file-menu menu is selected. If file-menu:open is bound to `#f` instead of a procedure, the open menu item will not be created.

- (send *a-frame:standard-menus* `file-menu:open` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  (lambda (item control) (handler:open-file) #t)
  ```

`file-menu:open-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `file-menu:open-help-string`) ⇒ string

  Defaultly returns "`Open a file from disk`"

`file-menu:open-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `file-menu:open-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

  ```
  void
  ```

`file-menu:open-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Open`" and "`...`" to form the complete name

- (send *a-frame:standard-menus* `file-menu:open-string`) ⇒ string

`file-menu:print`

This method is called when the print menu-item of the file-menu menu is selected. If file-menu:print is bound to `#f` instead of a procedure, the print menu item will not be created.

- (send *a-frame:standard-menus* `file-menu:print` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  #f
  ```

`file-menu:print-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `file-menu:print-help-string`) ⇒ string

  Defaultly returns "`Print this file`"

`file-menu:print-on-demand`

The menu item's on-demand method calls this method

- (`send` *a-frame:standard-menus* `file-menu:print-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

```
void
```

`file-menu:print-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Print`" and "`...`" to form the complete name

- (`send` *a-frame:standard-menus* `file-menu:print-string`) ⇒ string

`file-menu:quit`

This method is called when the quit menu-item of the file-menu menu is selected. If file-menu:quit is bound to `#f` instead of a procedure, the quit menu item will not be created.

- (`send` *a-frame:standard-menus* `file-menu:quit` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

```
(lambda (item control) (parameterize ((exit:frame-exiting this)) (exit:exit)))
```

`file-menu:quit-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `file-menu:quit-help-string`) ⇒ string

  Defaultly returns "`Quit`"

`file-menu:quit-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* file-menu:quit-on-demand *item*) ⇒ void
  item : menu-item%

  Defaultly is this:

```
void
```

file-menu:quit-string

The result of this method is used to construct the name of this menu. It is inserted between "(if (eq? (system-type) (quote windows)) E&xit Quit)" and "" to form the complete name

- (send *a-frame:standard-menus* file-menu:quit-string) ⇒ string

file-menu:revert

This method is called when the revert menu-item of the file-menu menu is selected. If file-menu:revert is bound to #f instead of a procedure, the revert menu item will not be created.

- (send *a-frame:standard-menus* file-menu:revert *item evt*) ⇒ void
  item : (instance (derived-from menu-item%))
  evt : (instance control-event%)

  Defaultly bound to:

```
#f
```

file-menu:revert-help-string

This result of this method is used as the help string when the menu-item% object is created.

- (send *a-frame:standard-menus* file-menu:revert-help-string) ⇒ string

  Defaultly returns "Revert this file to the copy on disk"

file-menu:revert-on-demand

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* file-menu:revert-on-demand *item*) ⇒ void
  item : menu-item%

  Defaultly is this:

```
void
```

file-menu:revert-string

The result of this method is used to construct the name of this menu. It is inserted between "&Revert" and "" to form the complete name

- (send *a-frame:standard-menus* file-menu:revert-string) ⇒ string

`file-menu:save`

This method is called when the save menu-item of the file-menu menu is selected. If file-menu:save is bound to `#f` instead of a procedure, the save menu item will not be created.

- (send *a-frame:standard-menus* `file-menu:save` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  #f
  ```

`file-menu:save-as`

This method is called when the save-as menu-item of the file-menu menu is selected. If file-menu:save-as is bound to `#f` instead of a procedure, the save-as menu item will not be created.

- (send *a-frame:standard-menus* `file-menu:save-as` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  #f
  ```

`file-menu:save-as-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (send *a-frame:standard-menus* `file-menu:save-as-help-string`) ⇒ string

  Defaultly returns "`Prompt for a filename and save this file to disk`"

`file-menu:save-as-on-demand`

The menu item's on-demand method calls this method

- (send *a-frame:standard-menus* `file-menu:save-as-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

  ```
  void
  ```

`file-menu:save-as-string`

The result of this method is used to construct the name of this menu. It is inserted between "`Save`" and "`&As...`" to form the complete name

- (send *a-frame:standard-menus* `file-menu:save-as-string`) ⇒ string

`file-menu:save-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- `(send` *a-frame:standard-menus* `file-menu:save-help-string)` ⇒ string
  Defaultly returns "`Save this file to disk`"

`file-menu:save-on-demand`

The menu item's on-demand method calls this method

- `(send` *a-frame:standard-menus* `file-menu:save-on-demand` *item*`)` ⇒ void
  item : `menu-item%`
  Defaultly is this:

  ```
  void
  ```

`file-menu:save-string`

The result of this method is used to construct the name of this menu. It is inserted between "`&Save`" and "" to form the complete name

- `(send` *a-frame:standard-menus* `file-menu:save-string)` ⇒ string

`get-checkable-menu-item%`

The result of this method is used as the class for creating checkable menu items in this class (see `frame:standard-menus%` for a list).

- `(send` *a-frame:standard-menus* `get-checkable-menu-item%)` ⇒ (derived-from `checkable-menu-item%`)
  defaultly returns `menu-item%`

`get-edit-menu`

Returns the edit menu See also `get-menu%`

- `(send` *a-frame:standard-menus* `get-edit-menu)` ⇒ (instance (derived-from `menu%`))

`get-file-menu`

Returns the file menu See also `get-menu%`

- `(send` *a-frame:standard-menus* `get-file-menu)` ⇒ (instance (derived-from `menu%`))

`get-help-menu`

Returns the help menu See also `get-menu%`

- `(send` *a-frame:standard-menus* `get-help-menu)` ⇒ (instance (derived-from `menu%`))

`get-menu-item%`

The result of this method is used as the class for creating the menu items in this class (see `frame:standard-menus%` for a list).

- (`send` *a-frame:standard-menus* `get-menu-item%`) ⇒ (derived-from `menu-item%`)

  defaultly returns `menu-item%`

`get-menu%`

The result of this method is used as the class for creating the result of these methods: `get-file-menu`, `get-edit-menu`, `get-help-menu`.

- (`send` *a-frame:standard-menus* `get-menu%`) ⇒ (derived-from `menu%`)

  defaultly returns `menu%`

`help-menu:about`

This method is called when the about menu-item of the help-menu menu is selected. If help-menu:about is bound to `#f` instead of a procedure, the about menu item will not be created.

- (`send` *a-frame:standard-menus* `help-menu:about` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Defaultly bound to:

  ```
  #f
  ```

`help-menu:about-help-string`

This result of this method is used as the help string when the `menu-item%` object is created.

- (`send` *a-frame:standard-menus* `help-menu:about-help-string`) ⇒ string

  Defaultly returns "`Learn something about this application`"

`help-menu:about-on-demand`

The menu item's on-demand method calls this method

- (`send` *a-frame:standard-menus* `help-menu:about-on-demand` *item*) ⇒ void
  item : `menu-item%`

  Defaultly is this:

  ```
  void
  ```

`help-menu:about-string`

The result of this method is used to construct the name of this menu. It is inserted between "`About `" and "`...`" to form the complete name

- `(send` *a-frame:standard-menus* `help-menu:about-string)` ⇒ string

`help-menu:after-about`

This method is called after the addition of the about menu-item to the help-menu menu. Override it to add additional menus at that point.

- `(send` *a-frame:standard-menus* `help-menu:after-about` *menu*`)` ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`help-menu:before-about`

This method is called before the addition of the about menu-item to the help-menu menu. Override it to add additional menus at that point.

- `(send` *a-frame:standard-menus* `help-menu:before-about` *menu*`)` ⇒ void
  menu : (instance (derived-from `menu%`))

  Does nothing.

`help-menu:get-about-item`

This method returns the iscmclassmenu-item that corresponds to this menu item.

- `(send` *a-frame:standard-menus* `help-menu:get-about-item)` ⇒ (instance iscmclasmenu-item)

11.10 `frame:standard-menus-mixin`

Domain: `frame:basic<%>`

Implements: `frame:standard-menus<%>`

Implements: `frame:basic<%>`

This frame provides a skeleton for the standard set of menus in a frame.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`on-subwindow-char`

Called when this window or a child window receives a keyboard event. The `on-subwindow-char` method of the receiver's top-level window is called first (see `get-top-level-window`); if the return value is `#f`, then

the `on-subwindow-char` method is called for the next child in the path to the receiver, and so on. Finally, if the receiver's `on-subwindow-char` method returns `#f`, the event is passed on to the receiver's normal key-handling mechanism.

BEWARE: The default `on-subwindow-char` in `frame%` and `on-subwindow-char` in `dialog%` methods consume certain keyboard events (e.g., arrow keys, Enter) used for navigating within the window. Because the top-level window gets the first chance to handle the keyboard event, some events never reach the "receiver" child unless the default frame or dialog method is overridden.

- (send *a-frame:standard-menus-mixin* `on-subwindow-char` *receiver event*) ⇒ bool
  receiver : `window<%>` object
  event : `key-event%` object

  Returns the result of

  ```
  (or (send this on-menu-char event)
  (send this on-system-menu-char event)
  (send this on-traverse-char event))
  ```

  If the `'framework:menu-bindings` preference is true, returns the result of calling `on-traverse-char`, which effectively skips `on-menu-char` and `on-system-menu-char`. If the preference is false, this method chains to the superclass method, instead.

11.11 `frame:editor<%>`

Extends: `frame:standard-menus<%>`

Frame classes matching this interface support embedded editors.

`get-canvas`

Returns the canvas used to display the `editor<%>` in this frame.

- (send *a-frame:editor* `get-canvas`) ⇒ (instance (derived-from `canvas%`))

`get-canvas<%>`

The result of this method is used to guard the result of the `get-canvas%` method.

- (send *a-frame:editor* `get-canvas<%>`) ⇒ (instance `canvas:basic%`)

`get-canvas%`

The result of this method is used to create the canvas for the `editor<%>` in this frame.

- (send *a-frame:editor* `get-canvas%`) ⇒ (derived-from `editor-canvas%`)

  Returns `editor-canvas%`.

`get-editor`

Returns the editor in this frame.

- `(send` *a-frame:editor* `get-editor)` ⇒ (instance (implements `editor<%>`))

`get-editor<%>`

The result of this method is used by `make-editor` to check that `get-editor%` is returning a reasonable editor.

- `(send` *a-frame:editor* `get-editor<%>)` ⇒ interface
  Returns `editor<%>`.

`get-editor%`

The result of this class is used to create the `editor<%>` in this frame.

Override this method to specify a different editor class.

- `(send` *a-frame:editor* `get-editor%)` ⇒ (implements `editor<%>`)

`get-entire-label`

This method returns the entire label for the frame. See also `set-label` and `set-label-prefix`.

- `(send` *a-frame:editor* `get-entire-label)` ⇒ string

`get-label-prefix`

This returns the prefix for the frame's label.

- `(send` *a-frame:editor* `get-label-prefix)` ⇒ string

`make-editor`

This method is called to create the editor in this frame. It calls `get-editor<%>` and uses that interface to make sure the result of `get-editor%` is reasonable.

- `(send` *a-frame:editor* `make-editor)` ⇒ (instance (implements `editor<%>`))
  Calls `(make-object get-editor%)`.

`save-as`

Queries the use for a file name and saves the file with that name.

- `(send` *a-frame:editor* `save-as` *format*`)` ⇒ void
  format = `'same` : (union 'guess 'standard 'text 'text-force-cr 'same 'copy)

`set-label-prefix`

Sets the prefix for the label of the frame.

- (`send` *a-frame:editor* `set-label-prefix` *prefix*) ⇒ void
  prefix : string

11.12 `frame:editor-mixin`

Domain: `frame:standard-menus<%>`

Implements: `frame:editor<%>`

Implements: `frame:standard-menus<%>`

This mixin adds functionality to support an `editor<%>` in the frame. This includes management of the title, implementations of some of the menu items, an reasonable initial size, and access to the `editor<%>` itself.

The size of this frame with be either 600 by 650 or 65 less than the width and height of the screen, whichever is smaller.

`edit-menu:between-select-all-and-find`

This method is called between the addition of the select-all menu-item and before the addition of the find menu-item to the edit-menu menu. Override it to add additional menus at that point.

- (`send` *a-frame:editor-mixin* `edit-menu:between-select-all-and-find` *edit-menu*) ⇒ void
  edit-menu : (instance `menu%`)

  Adds in methods: "Insert Text Box", "Insert Pasteboard Box", "Insert Image..." and "Toggle Wrap Text". The first three call `do-edit-operation` with `'insert-text-box`, `'insert-pasteboard-box`, and `'insert-image`, respectively. The item "Toggle Wrap Text" toggles the wrapping state of the editor by calling `auto-wrap`.

`file-menu:print`

This method is called when the print menu-item of the file-menu menu is selected. If file-menu:print is bound to `#f` instead of a procedure, the print menu item will not be created.

- (`send` *a-frame:editor-mixin* `file-menu:print` *item evt*) ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Calls the `print` method of `editor<%>` with the default arguments, except that the *output-mode* argument is the result of calling `preferences:get` with `'framework:print-output-mode`.

`file-menu:revert`

This method is called when the revert menu-item of the file-menu menu is selected. If file-menu:revert is bound to `#f` instead of a procedure, the revert menu item will not be created.

- `(send` *a-frame:editor-mixin* `file-menu:revert` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Loads the most recently saved version of the file to the disk. If the `editor<%>` is a `text%`, the start and end positions are restored.

`file-menu:save`

This method is called when the save menu-item of the file-menu menu is selected. If file-menu:save is bound to `#f` instead of a procedure, the save menu item will not be created.

- `(send` *a-frame:editor-mixin* `file-menu:save` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Saves the file in the editor.

`file-menu:save-as`

This method is called when the save-as menu-item of the file-menu menu is selected. If file-menu:save-as is bound to `#f` instead of a procedure, the save-as menu item will not be created.

- `(send` *a-frame:editor-mixin* `file-menu:save-as` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Prompts the user for a file name and uses that filename to save the buffer. Calls `save-as` with no arguments.

`get-filename`

This returns the filename that the frame is currently being saved as, or `#f` if there is no appropriate filename.

- `(send` *a-frame:editor-mixin* `get-filename``)` ⇒ (union #f string)

  Returns the filename in the editor returned by `get-editor`.

`get-label`

Gets a window's label. Control windows generally display their label in some way. Frames and dialogs display their label as a window title. Panels do not display their label, but the label can be used for identification purposes. Buttons and check boxes can have bitmap labels (only when they are created with bitmap labels), but all other windows have string labels.

The label string may contain ampersands ("&"), which serve as keyboard navigation annotations for controls under Windows and X. The ampersands are not part of the displayed label of a control; instead, ampersands are removed in the displayed label (under all platforms), and any character preceeding an ampersand is underlined (Windows and X) indicating that the character is a mnemonic for the control. Double ampersands are converted into a single ampersand (with no displayed underline). See also `on-traverse-char`.

If the window does not have a label, `#f` is returned.

- `(send` *a-frame:editor-mixin* `get-label)` ⇒ string

  Returns the portion of the label after the hyphen. See also `get-entire-label`.

`help-menu:about`

This method is called when the about menu-item of the help-menu menu is selected. If help-menu:about is bound to `#f` instead of a procedure, the about menu item will not be created.

- `(send` *a-frame:editor-mixin* `help-menu:about` *item evt*`)` ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)

  Calls `message-box` with a message welcoming the user to the application named by `application:current-app-name`

`help-menu:about-string`

The result of this method is used to construct the name of this menu. It is inserted between "`About` " and "`...`" to form the complete name

- `(send` *a-frame:editor-mixin* `help-menu:about-string)` ⇒ string

  Returns the result of (`application:current-app-name`)

`on-close`

Called just before the window is closed (e.g., by the window manager). This method is *not* called by `show` .

See also `can-close?`.

- `(send` *a-frame:editor-mixin* `on-close)` ⇒ void

  Calls the `editor:basic<%>`'s method `on-close`.

`set-label`

Sets a window's label. The window's natural minimum size might be different after the label is changed, but the window's mininum size is not recomputed.

See `get-label` for more information.

- `(send` *a-frame:editor-mixin* `set-label` *l*`)` ⇒ void
  l : string or `#f`

  If *l* is `#f`, the window's label is removed.

  Sets the label, but preserve's the label's prefix. See also `set-label-prefix`.

11.13 `frame:text<%>`

Extends: `frame:editor<%>`

Frames matching this interface provide support for `text%`s.

11.14 `frame:text-mixin`

Domain: `frame:editor<%>`

Implements: `frame:editor<%>`

Implements: `frame:text<%>`

This mixins adds support for `text%`s in the frame.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`get-editor<%>`

The result of this method is used by `make-editor` to check that `get-editor%` is returning a reasonable editor.

- `(send` *a-frame:text-mixin* `get-editor<%>)` ⇒ interface
  Returns `(class->interface text%)`.

`get-editor%`

The result of this class is used to create the `editor<%>` in this frame.

Override this method to specify a different editor class.

- `(send` *a-frame:text-mixin* `get-editor%)` ⇒ (implements `editor<%>`)
  Returns `text:keymap%`.

11.15 `frame:pasteboard<%>`

Extends: `frame:editor<%>`

Frames matching this interface provide support for `pasteboard%`s.

11.16 `frame:pasteboard-mixin`

Domain: `frame:editor<%>`

Implements: `frame:editor<%>`

Implements: `frame:pasteboard<%>`

This mixin provides support for pasteboards in a frame.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`get-editor<%>`

The result of this method is used by `make-editor` to check that `get-editor%` is returning a reasonable editor.

- `(send` *a-frame:pasteboard-mixin* `get-editor<%>)` ⇒ interface
  Returns `(class->interface pasteboard%)`.

`get-editor%`

The result of this class is used to create the `editor<%>` in this frame.

Override this method to specify a different editor class.

- `(send` *a-frame:pasteboard-mixin* `get-editor%)` ⇒ (implements `editor<%>`)
  Returns `pasteboard:keymap%`.

11.17 `frame:searchable<%>`

Extends: `frame:text<%>`

Frames that implement this interface support searching.

`get-text-to-search`

Override this method to specify which text to search.

- `(send` *a-frame:searchable* `get-text-to-search)` ⇒ (instance (derived-from `text%`))
  Returns the result of `get-editor`.

`hide-search`

This method hides the searching information on the bottom of the frame.

- `(send` *a-frame:searchable* `hide-search)` ⇒ void

`move-to-search-or-reverse-search`

This method moves the focus to the text that contains the search string, or if the focus is there already, performs a reverse search.

It returns void if the focus was not to the search text, otherwise it returns a boolean indicating the success of the search.

- `(send` *a-frame:searchable* `move-to-search-or-reverse-search)` ⇒ (union boolean void)

`move-to-search-or-search`

This method moves the focus to the text that contains the search string, or if the focus is there already, performs a forward search.

It returns void if the focus was not to the search text, otherwise it returns a boolean indicating the success of the search.

- `(send` *a-frame:searchable* `move-to-search-or-search)` ⇒ (union boolean void)

`replace`

If the selected text matches the search string, this method replaces the text with the contents of the replace text. If the replace was successful, `#t` is returned. Otherwise, `#f` is returned.

- `(send` *a-frame:searchable* `replace)` ⇒ boolean

`replace-all`

Loops through the text from the current position to the end, replacing all occurrances of the search string with the contents of the replace edit. Only searches forward, does not loop around to the beginning of the text.

- `(send` *a-frame:searchable* `replace-all)` ⇒ void

`replace&search`

Calls `replace` and if it returns `#t`, calls `search-again`.

- `(send` *a-frame:searchable* `replace&search)` ⇒ boolean

`search-again`

Searches for the text in the search edit in the result of `get-text-to-search`.

- `(send` *a-frame:searchable* `search-again` *direction beep?*`)` ⇒ boolean
  direction = previous searching direction : `'forward` or `'backward`
  beep? = `#t` : bool

  Returns `#t` if the text is found and sets the selection to the found text. If the text is not found it returns `#f`.

`set-search-direction`

Sets the direction that future searches will be performed.

- `(send` *a-frame:searchable* `set-search-direction` *dir*`)` ⇒ void
  dir : (union -1 1)

  If *dir* is `1` searches will be performed forwards and if *dir* is `-1` searches will be performed backwards.

`toggle-search-focus`

Toggles the keyboard focus between the searching edit, the replacing edit and the result of `get-text-to-search`.

- `(send` *a-frame:searchable* `toggle-search-focus)` ⇒ void

`unhide-search`

When the searching sub window is hidden, makes it visible.

- `(send` *a-frame:searchable* `unhide-search)` ⇒ void

11.18 `frame:searchable-mixin`

Domain: `frame:text<%>`

Implements: `frame:text<%>`

Implements: `frame:searchable<%>`

This mixin adds support for searching in the `editor<%>` in this frame.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`edit-menu:find`

This method is called when the find menu-item of the edit-menu menu is selected. If edit-menu:find is bound to `#f` instead of a procedure, the find menu item will not be created.

- `(send` *a-frame:searchable-mixin* `edit-menu:find` *item evt)* ⇒ void
  item : (instance (derived-from `menu-item%`))
  evt : (instance `control-event%`)
  Calls `move-to-search-or-search`.

`edit-menu:find-again`

This method is called when the find-again menu-item of the edit-menu menu is selected. If edit-menu:find-again is bound to `#f` instead of a procedure, the find-again menu item will not be created.

- `(send` *a-frame:searchable-mixin* `edit-menu:find-again)` ⇒ boolean
  Returns `#t`, and searches for the same text that was last searched for in the text.

`edit-menu:replace-and-find-again`

This method is called when the replace-and-find-again menu-item of the edit-menu menu is selected. If edit-menu:replace-and-find-again is bound to `#f` instead of a procedure, the replace-and-find-again menu item

will not be created.

- `(send` *a-frame:searchable-mixin* `edit-menu:replace-and-find-again)` ⇒ boolean

  Returns `#t`, and if the selected text matches the current text in the find box, replaces it with the contents of the replace box and searches for the next occurance of the text in the find box.

`get-editor<%>`

The result of this method is used by `make-editor` to check that `get-editor%` is returning a reasonable editor.

- `(send` *a-frame:searchable-mixin* `get-editor<%>)` ⇒ interface

  Returns `text:searching<%>`.

`get-editor%`

The result of this class is used to create the `editor<%>` in this frame.

Override this method to specify a different editor class.

- `(send` *a-frame:searchable-mixin* `get-editor%)` ⇒ (implements `editor<%>`)

  This method returns `text:searching%`.

`make-root-area-container`

Override this method to insert a panel in between the panel used by the clients of this frame and the frame itself. For example, to insert a status line panel override this method with something like this:

```
  ...
 (rename [super-make-root-area-container make-root-area-container])
 (private
   [status-panel #f])
 (override
   [make-root-area-container
    (lambda (class parent)
      (set! status-panel
            (super-make-root-area-container
               vertical-panel%
               parent))
      (let* ([root (make-object class status-panel)])

        ; ... add other children to status-panel ...

        root))])
  ...
```

In this example, status-panel will contain a root panel for the other classes, and whatever panels are needed to display status information.

The searching frame is implemented using this method.

- `(send` *a-frame:searchable-mixin* `make-root-area-container)` ⇒ (implements `area-container<%>`)

  Calls `make-object` with *class* and *parent*.

  Builds a panel for the searching information.

`on-activate`

Called when a window is **activated** or **deactivated**. A top-level window is activated when the keyboard focus moves from outside the window to the window or one of its children. It is deactivated when the focus moves back out of the window.

The method's argument is `#t` when the window is activated, `#f` when it is deactivated.

- `(send` *a-frame:searchable-mixin* `on-activate` *active?*`)` ⇒ void
  active? : boolean

  When the frame is activated, searches will take place in this frame.

`on-close`

Called just before the window is closed (e.g., by the window manager). This method is *not* called by `show` .

See also `can-close?`.

- `(send` *a-frame:searchable-mixin* `on-close)` ⇒ void

  Cleans up after the searching frame.

11.19 `frame:file<%>`

Extends: `frame:editor<%>`

Frames supporting this interface manage editors, like frames supporting the `frame:editor<%>` interface, but in addition, they support editors that match the `editor:file<%>` interface.

11.20 `frame:file-mixin`

Domain: `frame:editor<%>`

Implements: `frame:file<%>`

Implements: `frame:editor<%>`

This mixin adds support for `editor:file<%>` objects.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`can-close?`

Called just before the window might be closed (e.g., by the window manager). If `#f` is returned, the window is not closed, otherwise `on-close` is called and the window is closed (i.e., the window is hidden, like calling `show` with `#f`).

This method is *not* called by `show` .

- `(send` *a-frame:file-mixin* `can-close?)` ⇒ boolean

  Checks to see if the editor has been saved.

11.21 frame:basic% = (frame:basic-mixin frame%)

`frame:basic% = (frame:basic-mixin frame%)`

- `(make-object frame:basic%` *label parent width height x y style*`)` ⇒ `frame:basic%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

  - `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
  - `'no-caption` — omits the title bar for the frame (Windows)
  - `'no-system-menu` — omits the system menu (Windows)
  - `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
  - `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

  If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

  Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.22 `frame:info% = (frame:info-mixin frame:basic%)`

`frame:info% = (frame:info-mixin frame:basic%)`

- `(make-object frame:info%` *label parent width height x y style*`)` ⇒ `frame:info%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

  - `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
  - `'no-caption` — omits the title bar for the frame (Windows)
  - `'no-system-menu` — omits the system menu (Windows)
  - `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
  - `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

  If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

  Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.23 `frame:text-info% = (frame:text-info-mixin frame:info%)`

`frame:text-info% = (frame:text-info-mixin frame:info%)`

- `(make-object frame:text-info%` *label parent width height x y style*`)` ⇒ `frame:text-info%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`

height = `#f` : exact integer in [0, 10000] or `#f`
x = `#f` : exact integer in [0, 10000] or `#f`
y = `#f` : exact integer in [0, 10000] or `#f`
style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- `'no-caption` — omits the title bar for the frame (Windows)
- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.24 frame:pasteboard-info% = (frame:pasteboard-info-mixin frame:text-info%)

`frame:pasteboard-info% = (frame:pasteboard-info-mixin frame:text-info%)`

- `(make-object frame:pasteboard-info%` *label parent width height x y style*`)` ⇒ `frame:pasteboard-info%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- `'no-caption` — omits the title bar for the frame (Windows)
- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.25 `frame:standard-menus% = (frame:standard-menus-mixin frame:pasteboard-info%)`

`frame:standard-menus% = (frame:standard-menus-mixin frame:pasteboard-info%)`

- `(make-object frame:standard-menus%` *label parent width height x y style*`)` ⇒ `frame:standard-menus%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- `'no-caption` — omits the title bar for the frame (Windows)
- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.26 frame:editor% = (frame:editor-mixin frame:standard-menus%)

`frame:editor% = (frame:editor-mixin frame:standard-menus%)`

- (`make-object` `frame:editor%` *label parent width height x y style*) ⇒ `frame:editor%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

  - `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
  - `'no-caption` — omits the title bar for the frame (Windows)

- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.27 `frame:text% = (frame:text-mixin frame:editor%)`

`frame:text% = (frame:text-mixin frame:editor%)`

- `(make-object frame:text%` *label parent width height x y style*`)` ⇒ `frame:text%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

  The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

  - `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
  - `'no-caption` — omits the title bar for the frame (Windows)
  - `'no-system-menu` — omits the system menu (Windows)
  - `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
  - `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

  If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

  Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.28 frame:text-info-file% = (frame:file-mixin frame:text%)

```
frame:text-info-file% = (frame:file-mixin frame:text%)
```

- (make-object frame:text-info-file% *label parent width height x y style*) ⇒ frame:text-info-file% object
  label : string
  parent = #f : frame% object or #f
  width = #f : exact integer in [0, 10000] or #f
  height = #f : exact integer in [0, 10000] or #f
  x = #f : exact integer in [0, 10000] or #f
  y = #f : exact integer in [0, 10000] or #f
  style = null : list of symbols in '(no-resize-border no-caption no-system-menu mdi-parent mdi-child)

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see set-label), the title bar is updated.

  The *parent* argument can be #f or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is #f, then the eventspace for the new frame is the current eventspace, as determined by current-eventspace . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not #f, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

  If the *x* or *y* argument is not #f, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

  The *style* flags adjust the appearance of the frame on some platforms:

  - 'no-resize-border — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
  - 'no-caption — omits the title bar for the frame (Windows)
  - 'no-system-menu — omits the system menu (Windows)
  - 'mdi-child — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with 'mdi-parent (Windows)
  - 'mdi-parent — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with 'mdi-child (Windows)

  If the 'mdi-child style is specified, the *parent* must be a frame with the 'mdi-parent style, otherwise an exn:application:mismatch exception is raised.

  Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.29 frame:searchable% = (frame:searchable-mixin frame:text-info-file%)

```
frame:searchable% = (frame:searchable-mixin frame:text-info-file%)
```

- (make-object frame:searchable% *label parent width height x y style*) ⇒ frame:searchable% object
  label : string
  parent = #f : frame% object or #f

width = `#f` : exact integer in [0, 10000] or `#f`
height = `#f` : exact integer in [0, 10000] or `#f`
x = `#f` : exact integer in [0, 10000] or `#f`
y = `#f` : exact integer in [0, 10000] or `#f`
style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

The *parent* argument can be `#f` or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

If *parent* is `#f`, then the eventspace for the new frame is the current eventspace, as determined by `current-eventspace` . Otherwise, *parent*'s eventspace is the new frame's eventspace.

If the *width* or *height* argument is not `#f`, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the *x* or *y* argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- `'no-caption` — omits the title bar for the frame (Windows)
- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.30 `frame:pasteboard% = (frame:pasteboard-mixin frame:editor%)`

`frame:pasteboard% = (frame:pasteboard-mixin frame:editor%)`

- `(make-object frame:pasteboard%` *label parent width height x y style*`)` ⇒ `frame:pasteboard%` object
  label : string
  parent = `#f` : `frame%` object or `#f`
  width = `#f` : exact integer in [0, 10000] or `#f`
  height = `#f` : exact integer in [0, 10000] or `#f`
  x = `#f` : exact integer in [0, 10000] or `#f`
  y = `#f` : exact integer in [0, 10000] or `#f`
  style = `null` : list of symbols in `'(no-resize-border no-caption no-system-menu mdi-parent mdi-child)`

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see `set-label`), the title bar is updated.

The *parent* argument can be #f or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

If *parent* is #f, then the eventspace for the new frame is the current eventspace, as determined by current-eventspace . Otherwise, *parent*'s eventspace is the new frame's eventspace.

If the *width* or *height* argument is not #f, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the *x* or *y* argument is not #f, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- 'no-resize-border — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- 'no-caption — omits the title bar for the frame (Windows)
- 'no-system-menu — omits the system menu (Windows)
- 'mdi-child — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with 'mdi-parent (Windows)
- 'mdi-parent — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with 'mdi-child (Windows)

If the 'mdi-child style is specified, the *parent* must be a frame with the 'mdi-parent style, otherwise an exn:application:mismatch exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.31 frame:pasteboard-info-file% = (frame:file-mixin frame:pasteboard%)

```
frame:pasteboard-info-file% = (frame:file-mixin frame:pasteboard%)
```

- (make-object frame:pasteboard-info-file% *label parent width height x y style*) ⇒ frame:pasteboard-info-f
  object
  label : string
  parent = #f : frame% object or #f
  width = #f : exact integer in [0, 10000] or #f
  height = #f : exact integer in [0, 10000] or #f
  x = #f : exact integer in [0, 10000] or #f
  y = #f : exact integer in [0, 10000] or #f
  style = null : list of symbols in '(no-resize-border no-caption no-system-menu mdi-parent mdi-child)

  The *label* string is displayed in the frame's title bar. If the frame's label is changed (see set-label), the title bar is updated.

  The *parent* argument can be #f or an existing frame. Under Windows, if *parent* is an existing frame, the new frame is always on top of its parent. Also, the *parent* frame may be an MDI parent frame from a new MDI child frame. Under Windows and X (for many window wanagers), a frame is iconized when its parent is iconized.

  If *parent* is #f, then the eventspace for the new frame is the current eventspace, as determined by current-eventspace . Otherwise, *parent*'s eventspace is the new frame's eventspace.

  If the *width* or *height* argument is not #f, it specifies an initial size for the frame (in pixels) assuming that it is larger than the minimum size, otherwise the minimum size is used.

If the x or y argument is not `#f`, it specifies an initial location for the frame. Otherwise, a location is selected automatically (tiling frames and dialogs as they are created).

The *style* flags adjust the appearance of the frame on some platforms:

- `'no-resize-border` — omits the resizeable border around the window (Windows) or grow box in the bottom right corner (MacOS)
- `'no-caption` — omits the title bar for the frame (Windows)
- `'no-system-menu` — omits the system menu (Windows)
- `'mdi-child` — creates the frame as a MDI (multiple document interface) child frame, mutually exclsuive with `'mdi-parent` (Windows)
- `'mdi-parent` — creates the frame as a MDI (multiple document interface) parent frame, mutually exclsuive with `'mdi-child` (Windows)

If the `'mdi-child` style is specified, the *parent* must be a frame with the `'mdi-parent` style, otherwise an `exn:application:mismatch` exception is raised.

Even if the frame is not shown, a few notification events may be queued for the frame on creation. Consequently, the new frame's resources (e.g., memory) cannot be reclaimed until some events are handled, or the frame's eventspace is shut down.

11.32 Frame Utilities

`frame:reorder-menus`

Re-orders the menus in a frame. This is useful in conjunction with the `frame:standard-menus%` class. After instantiating that class and adding menus, the menus will be mis-ordered. This will put the File and Edit menus at the front of the menubar and the Help menu at the end.

- (`frame:reorder-menus` *frame*) ⇒ void
  frame : (instance `frame%`)

12. Group

A **frame group** associates a group of frames together. There is one frame group in mred, called `group:the-frame-group`, which is an object of the `group:%` class.

The frame group manages the windows menu. It also and enables the close menu item on each frame, when there is more than one frame in the group, and disables the close menu item when there is only one frame in the frame group.

12.1 group:%

This class manages a group of frames matching the `frame:basic<%>` interface. There is one instance created by the framework, returned by the function `group:get-the-frame-group` and every frame that was constructed with `frame:basic-mixin` adds itself to the result of `group:get-the-frame-group`.

`can-close-all?`

Call this method to make sure that closing all of the frames in the frame groups is permitted by the user. The function `on-close-all` is expected to be called just after this method is called.

- `(send` *a-group:* `can-close-all?)` ⇒ void

  Calls the `can-close?` method of each frame in the group.

`can-remove-frame?`

- `(send` *a-group:* `can-remove-frame?)` ⇒ boolean

`clear`

This removes all of the frames in the group. It does not close the frames. See also `on-close-all`and `can-close-all?`.

- `(send` *a-group:* `clear)` ⇒ boolean

`for-each-frame`

This method applies a function to each frame in the group. It also remembers the function and applies it to any new frames that are added to the group when they are added.

See also `get-frames`.

- (send *a-group:* for-each-frame *f*) ⇒ void
  f : ((instance frame:basic<%>) -¿ void)

  Applies *f* to each frame in the group

frame-label-changed

This method is called by frames constructed with frame:basic-mixin when their titles change.

- (send *a-group:* frame-label-changed *frame*) ⇒ void
  frame : (implements frame:basic<%>)

  Updates the windows menu of each frame in the group.

get-active-frame

Returns the frame with the keyboard focus or the first frame in the group.

- (send *a-group:* get-active-frame) ⇒ (implements frame:basic<%>)

get-frames

Returns the frames in the group.

- (send *a-group:* get-frames) ⇒ (list-of (instance frame:basic<%>))

get-mdi-parent

The result of this method must be used as the parent frame for each frame in the group.

- (send *a-group:* get-mdi-parent) ⇒ (union #f (instance frame%))

insert-frame

Inserts a frame into the group.

- (send *a-group:* insert-frame *frame*) ⇒ void
  frame : (implements frame:basic<%>)

locate-file

Returns the frame that is editing or viewing a particular file.

- (send *a-group:* locate-file) ⇒ (union #f (implements frame:basic<%>))

on-close-all

Call this method to close all of the frames in the group. The function can-close-all? must have been called just before this function and it must have returned #t.

- (send *a-group:* on-close-all) ⇒ void

  Calls the on-close method and the show method (with #f as argument) on each frame in the group.

remove-frame

Removes a frame from the group.

- (send *a-group:* remove-frame *frame*) ⇒ void
  frame : (implements frame:basic<%>)

set-active-frame

Sets the active frame in the group. This method is called by on-focus.

- (send *a-group:* set-active-frame *frame*) ⇒ void
  frame : (implements frame:basic<%>)

set-empty-callbacks

Sets the empty callbacks. These functions are called when the frame group is empty.

- (send *a-group:* set-empty-callbacks *test close-down*) ⇒ void
  test : (-¿ boolean)
  close-down : (-¿ void)

  The function *test* is called when there is one frame left in the group. If it returns #t, the closing operation may be completed. If it returns #f, the closing operation is aborted.

  The function *close-down* is called when there are no frames left in the group.

12.2 Group Utilities

group:get-the-frame-group

This returns the frame group.

- (group:get-the-frame-group) ⇒ (instance group:%)

13. GUI Utilities

This section has several utility for GUI programs.

13.1 gui-utils:text-snip<%>

Objects that implement this interface are treated specially by `gui-utils:read-snips/chars-from-text`.

`get-string`

See `gui-utils:read-snips/chars-from-text` for more information.

- `(send` *a-gui-utils:text-snip* `get-string)` ⇒ string

13.2 Gui-utils Utilities

`gui-utils:cursor-delay`

This function is *not* a parameter.

- `(gui-utils:cursor-delay)` ⇒ real

  Returns the current delay in seconds before a watch cursor is shown, when either `gui-utils:local-busy-cursor` or `gui-utils:show-busy-cursor%` is called.

- `(gui-utils:cursor-delay` *new-delay*`)` ⇒ void
  new-delay : real

  Sets the delay, in seconds, before a watch cursor is shown, when either `gui-utils:local-busy-cursor` or `gui-utils:show-busy-cursor%` is called.

`gui-utils:delay-action`

Use this function to delay an action for some period of time. It also supports cancelling the action before the time period elapses. For example, if you want to display a watch cursor, but you only want it to appear after 2 seconds and the action may or may not take more than two seconds, use this pattern:

```
(let ([close-down
       (gui-utils:delay-action
         2
         (lambda () .. init watch cursor ...)
         (lambda () .. close watch cursor ...))])

  .. do action ...
  (close-down))
```

- (gui-utils:delay-action *delay-time open close*) ⇒ (-¿ void)
  delay-time : real
  open : (-¿ void)
  close : (-¿ void)

  Creates a thread that waits *delay-time*. After *delay-time* has elapsed, if the result thunk has *not* been called, call *open*. Then, when the result thunk is called, call *close*. The function *close* will only be called if *open* has been called.

gui-utils:get-choice

Opens a dialog that presents a binary choice to the user. The user is forced to choose between these two options, ie cancelling or closing the dialog opens a message box asking the user to actually choose one of the two options.

- (gui-utils:get-choice *message true-choice false-choice title default-result parent*) ⇒ boolean
  message : string
  true-choice : string
  false-choice : string
  title = "Warning" : string
  default-result = 'disallow-close : (union 'disallow-close TST)
  parent : (union frame% dialog% #f)

  The dialog will contain the string *message* and two buttons, labeled with the *true-choice* and the *false-choice*. If the user clicks on *true-choice* #t is returned. If the user clicks on *false-choice*, #f is returned.

  The argument *default-result* determines how closing the window is treated. If the argument is 'disallow-close, closing the window is not allowed. If it is anything else, that value is returned when the user closes the window.

gui-utils:get-clickback-delta

- (gui-utils:get-clickback-delta) ⇒ (instance style-delta%)

  this delta is designed for use with set-clickback. Set the text that is clickable to this style-delta. It turns the text blue and underlines it.

gui-utils:get-clicked-clickback-delta

- (gui-utils:get-clicked-clickback-delta) ⇒ (instance style-delta%)

  this delta is designed for use with set-clickback. Use it as the style-delta% argument to set-clickback.

gui-utils:local-busy-cursor

- (gui-utils:local-busy-cursor *window thunk delay*) ⇒ A
  window : (union #f (implements window<%>))
  thunk : (-¿ A)
  delay = (gui-utils:cursor-delay) : integer

  Evaluates (*thunk*) with a watch cursor in *window*. If *window* is #f, the watch cursor is turned on globally. The argument *delay* specifies the amount of time before the watch cursor is opened. Use gui-utils:cursor-delay to set this value for all uses of this function.

  The result of this function is the result of *thunk*.

`gui-utils:next-untitled-name`

Returns a name for the next opened untitled frame. The first name is "Untitled", the second is "Untitled 2", the third is "Untitled 3", and so forth.

- `(gui-utils:next-untitled-name)` ⇒ string

`gui-utils:open-input-buffer`

- `(gui-utils:open-input-buffer` *text*`)` ⇒ input-port
  text : `text%` object

  This procedure returns a port that reads characters from the buffer.

`gui-utils:read-snips/chars-from-text`

This function returns a thunk, which when called returns all of the characters and non-text-snips from the edit, one by one.

If this function encounters a snip that matches `gui-utils:text-snip<%>`, it uses the `get-string` method to get a string from the snip and returns the characters in that.

- `(gui-utils:read-snips/chars-from-text` *text start end*`)` ⇒ (-¿ (union char (instance `snip%`) eof-object))
  text : (instance `text%`)
  start = `0` : integer
  end = `(send text last-position)` : integer

`gui-utils:show-busy-cursor`

- `(gui-utils:show-busy-cursor` *thunk delay*`)` ⇒ A
  thunk : (-¿ A)
  delay = `(gui-utils:cursor-delay)` : integer

  Evaluates `(`*thunk*`)` with a watch cursor. The argument *delay* specifies the amount of time before the watch cursor is opened. Use `gui-utils:cursor-delay` to set this value to all calls.

  This function returns the result of *thunk*.

`gui-utils:unsaved-warning`

This displays a dialog that warns the user of a unsaved file.

- `(gui-utils:unsaved-warning` *filename action can-save-now? parent*`)` ⇒ (union 'continue 'save 'cancel)
  filename : string
  action : string
  can-save-now? = `#f` : boolean
  parent = `#f` : (union #f (instance `frame%`) (instance `dialog%`))

  The string, *action*, indicates what action is about to take place. For example, if the application is about to close a file, a good action is `"Close"`. The result symbol indicates the user's choice. If *can-save-now?* is `#f`, this function does not give the user the "Save" option and thus will not return `'save`.

14. Handler

14.0.0.1 Opening a File and Selecting a Format Handler

The function `handler:edit-file` takes a filename and dispatches it to an appropriate **format handler**. A format handler takes a filename and opens a frame for the user to view or edit the file. If no handler is found for a particular format, then the file is opened as a raw text file, in a `frame:text-info-file%` object.

The function `handler:open-file` lets the user select a filename using `finder:get-file`, and then passes the name to `handler:edit-file`.

14.1 Handler Utilities

`handler:edit-file`

This function creates a frame to edit a file.

It invokes the appropriate format handler to open the file (see `handler:insert-format-handler`).

- (`handler:edit-file` *filename make-default*) ⇒ (implements `frame:editor<%>`)
  filename : (union string #f)
  make-default = `(lambda () (make-object frame:text-info-file% filename))` : (-¿ (implements `frame:editor<`
  - If *filename* is a string, this function checks the result of `group:get-the-frame-group` to see if the *filename* is already open by a frame in the group.
    * If so, it returns the frame.
    * If not, this function calls `handler:find-format-handler` with *filename*.
      · If a handler is found, it is applied to *filename* and it's result is the final result.
      · If not, *make-default* is used.
  - If *filename* is `#f`, *make-default* is used.

`handler:find-format-handler`

This function selects a format handler. See also `handler:insert-format-handler`.

- (`handler:find-format-handler` *filename*) ⇒ (string -¿ (implements `frame:editor<%>`))
  filename : string

  It finds a handler based on *filename*.

`handler:find-named-format-handler`

This function selects a format handler. See also `handler:insert-format-handler`.

- (`handler:find-named-format-handler` *name*) ⇒ (string -¿ (implements `frame:editor<%>`))
  name : string

  It finds a handler based on *name*.

`handler:insert-format-handler`

This function inserts a format handler.

- (`handler:insert-format-handler` *name pred handler*) ⇒ void
  name : string
  pred : (union string (listof string) (string -¿ boolean))
  handler : (string -¿ (implements `frame:editor<%>`))

  The string, *name* names the format handler for use with `handler:find-named-format-handler`. If *pred* is a string, it is matched with the extension of a filename by `handler:find-format-handler`. If *pred* is a list of strings, they are each matched with the extension of a filename by `handler:find-format-handler`. If it is a function, the filename is applied to the function and the functions result determines if this is the handler to use.

`handler:open-file`

This function queries the user for a filename and opens the file for editing. It uses `handler:edit-file` to open the file, once the user has chosen it.

- (`handler:open-file`) ⇒ (instance `frame:basic<%>`)

  Calls `finder:get-file` and `handler:edit-file`.

15. Icon

15.1 Icon Utilities

`icon:get-anchor-bitmap`

This returns the anchor's `bitmap%`.

- `(icon:get-anchor-bitmap)` ⇒ (implements `bitmap%`)

`icon:get-autowrap-bitmap`

This returns the autowrap's `bitmap%`.

- `(icon:get-autowrap-bitmap)` ⇒ (implements `bitmap%`)

`icon:get-gc-off-bitmap`

- `(icon:get-gc-off-bitmap)` ⇒ (instance `bitmap%`)

  This returns a bitmap to be displayed in an `frame:info<%>` frame when garbage collection is *not* taking place.

`icon:get-gc-on-bitmap`

- `(icon:get-gc-on-bitmap)` ⇒ (instance `bitmap%`)

  This returns a bitmap to be displayed in an `frame:info<%>` frame when garbage collection is taking place.

`icon:get-lock-bitmap`

This returns the lock's `bitmap%`.

- `(icon:get-lock-bitmap)` ⇒ (implements `bitmap%`)

`icon:get-paren-highlight-bitmap`

This returns the parenthesis highlight `bitmap%`. It is only used on black and white screens.

- `(icon:get-paren-highlight-bitmap)` ⇒ (implements `bitmap%`)

`icon:get-unlock-bitmap`

This returns the reset unlocked `bitmap%`.

- `(icon:get-unlock-bitmap)` ⇒ (implements `bitmap%`)

16. Keymap

16.1 keymap:aug-keymap<%>

Extends: `(class->interface keymap%)`

This keymap overrides some of the built in `keymap%` methods to be able to extract the keybindings from the keymap.

`get-chained-keymaps`

- `(send` *a-keymap:aug-keymap* `get-chained-keymaps)` ⇒ (listof (instance `keymap%`))

  Returns the list of keymaps that are chained to this one.

`get-map-function-table`

- `(send` *a-keymap:aug-keymap* `get-map-function-table)` ⇒ hash-table

  Returns a hash-table that maps symbols naming key sequences to the names of the keymap functions the are bound to.

`get-map-function-table/ht`

- `(send` *a-keymap:aug-keymap* `get-map-function-table/ht` *ht*`)` ⇒ hash-table
  ht : hash-table

  This is a helper function for `get-map-function-table` that returns the same result, except it accepts a hash-table that it inserts the bindings into. It does not replace any bindings already in *ht*.

16.2 keymap:aug-keymap-mixin

Domain: `(class->interface keymap%)`

Implements: `keymap:aug-keymap<%>`

- `(make-object keymap:aug-keymap-mixin%)` ⇒ `keymap:aug-keymap-mixin%` object

  Creates an empty keymap.

`chain-to-keymap`

Multiple keymaps can be chained off one keymap using `chain-to-keymap`. When keymaps are chained to a main keymap, then events handled by the main keymap are passed to the chained keymaps until a chained keymap handles the events. Keymaps can be chained together in an arbitrary acyclic graph.

Keymap chaining is useful because multiple-event sequences are handled correctly by chained groups. Dispatching each individual event to separate keymaps is problematic withouth chaining because keymaps may acquire state that must be reset when a callback is invoked in one of the keymaps. This state can be maually cleared with `break-sequence`, but this also invokes the handler installed by `set-break-sequence-callback`.

- (send *a-keymap:aug-keymap-mixin* `chain-to-keymap` *next prefix?*) ⇒ void
  next : (instance `keymap%`)
  prefix? : boolean

  If *next* will be used to handle events which are not handled by this keymap. If *prefix?* is a true value, then *next* will take precedence over other keymaps already chained to this one.

  Keeps a list of the keymaps chained to this one.

`map-function`

Maps an input state to the name of an event handler.

- (send *a-keymap:aug-keymap-mixin* `map-function` *key-name function-name*) ⇒ void
  key-name : string
  function-name : string

  Maps an input state sequence to a function name using a string-encoded sequence in *keyname*. The format of *keyname* is a sequence of semicolon-delimited input states; each state is made up of a sequence of modifier identifiers followed by a key identifier.

  The modifier identifiers are:

  – "s:" — All platforms: Shift
  – "c:" — All platforms: Control
  – "a:" — MacOS: Option
  – "m:" — Windows: Alt; X: Meta
  – "d:" — MacOS: Command

  If a particular modifier is not mentioned in a state string, it matches states whether that modifier is pressed or not pressed. A tilde ( ) preceding a modifier makes the string match only states where the corresponding modifier is not pressed. If the state string begins with a colon, then the string only matches a state if modifiers not mentioned in the string are not pressed.

  A key identifier can be either a character on the keyboard (e.g., `"a"`, `"2"`, `"?"`) or a special name. The special names are:

  – `"leftbutton"` (button down)
  – `"rightbutton"`
  – `"middlebutton"`
  – `"leftbuttondouble"` (button down for double-click)
  – `"rightbuttondouble"`
  – `"middlebuttondouble"`
  – `"leftbuttontriple"` (button down for triple-click)
  – `"rightbuttontriple"`
  – `"middlebuttontriple"`
  – `"leftbuttonseq"` (all events from button down through button up)

- "rightbuttonseq"
- "middlebuttonseq"
- "esc"
- "delete"
- "del" (same as "delete")
- "insert"
- "ins" (same as "insert")
- "add"
- "subtract"
- "multiply"
- "divide"
- "backspace"
- "back"
- "return"
- "enter" (same as "return")
- "tab"
- "space"
- "right"
- "left"
- "up"
- "down"
- "home"
- "end"
- "pageup"
- "pagedown"
- "semicolon"
- "colon"
- "numpad1"
- "numpad2"
- "numpad3"
- "numpad4"
- "numpad5"
- "numpad6"
- "numpad7"
- "numpad8"
- "numpad9"
- "f1"
- "f2"
- "f3"
- "f4"
- "f5"
- "f6"
- "f7"
- "f8"
- "f9"
- "f10"
- "f11"
- "f12"
- "f13"
- "f14"
- "f15"
- "f16"
- "f17"

- "f18"
- "f19"
- "f20"
- "f21"
- "f22"
- "f23"
- "f24"

For a special keyword, the capitalization does not matter. However, capitalization is important for single-letter keynames (e.g., "A" is interpreted as "s:a").

A state can match multiple state strings mapped in a keymap (or keymap chain); when a state matches multiple state strings, a mapping is selected by ranking the strings according to specificity. A state string that mentions more pressed modifiers has a higher rank than other state strings, and if two strings mention the same number of pressed modifiers, the one that metions more unpressed modifiers has a higher rank. In that case that multiple matching strings have the same rank, one string is selected arbitrarily.

Examples:

- "space" — matches whenever the space bar is pressed, regardless of the state of modifiers keys.
- " c:space" — matches whenever the space bar is pressed and the Control key is not pressed.
- "a" — matches whenever "a" is typed, regardless of the state of modifiers keys other than Shift.
- ":a" — matches only when "a" is typed with no modifier keys pressed.
- " c:a" — matches whenever "a" is typed and neither the Shift key nor the Control key is pressed.
- ":esc;:c:c" — matches an Escape key press (no modifiers) followed by a Control-C press (no modifiers other than Control).

A call to map-function that would map a particular key sequence both as a prefix and as a complete sequence raises an exception, but the exception handler cannot escape (see Exceptions and Continuation Jumps, §2.4.4 in *PLT MrEd: Graphical Toolbox Manual*).

A function name does not have to be mapped to a handler before input states are mapped to the name; the handler is dispatched by name at the time of invocation. The event handler mapped to a function name can be changed without affecting the map from input states to function names.

Keeps a separate record of the key names and functions that they are bound to in this keymap.

16.3 keymap:aug-keymap% = (keymap:aug-keymap-mixin keymap%)

keymap:aug-keymap% = (keymap:aug-keymap-mixin keymap%)

- (make-object keymap:aug-keymap%) ⇒ keymap:aug-keymap% object

  Creates an empty keymap.

16.4 Keymap Utilities

keymap:call/text-keymap-initializer

- (keymap:call/text-keymap-initializer *thunk-proc*) ⇒ A
  thunk-proc : (-¿ A)

  Parameterize the call to *thunk-proc* by setting the keymap-initialization procedure (see current-text-keymap-initializer) to install the framework's standard text bindings.

`keymap:canonicalize-keybinding-string`

- (`keymap:canonicalize-keybinding-string` *keybinding-string*) ⇒ string
  keybinding-string : string

  Returns a string that denotes the same keybindings as the input string, except that it is in canonical form; two canonical keybinding strings can be compared with `string=?`.

`keymap:get-editor`

This returns a keymap for handling standard editing operations. It binds these keys:

- **z**: undo
- **y**: redo
- **x**: cut
- **c**: copy
- **v**: paste
- **a**: select all

where each key is prefixed with the menu-shortcut key, based on the platform. Under unix, the shortcut is scm"a:"; under windows the shortcut key is `"c:"` and under MacOS, the shortcut key is `"d:"`.

- (`keymap:get-editor`) ⇒ (instance `keymap%`)

`keymap:get-file`

This returns a keymap for handling file operations.

- (`keymap:get-file`) ⇒ (instance `keymap%`)

`keymap:get-global`

This returns a keymap for general operations. See `keymap:setup-global` for a list of the bindings this keymap contains.

- (`keymap:get-global`) ⇒ (implements `keymap%`)

`keymap:get-search`

This returns a keymap for searching operations

- (`keymap:get-search`) ⇒ (implements `keymap%`)

`keymap:make-meta-prefix-list`

This prefixes a key with all of the different meta prefixes and returns a list of the prefixed strings.

takes a keymap, a base key specification, and a function name; it prefixes the base key with all "meta" combination prefixes, and installs the new combinations into the keymap. For example, (`keymap:send-map-function-meta` *keymap* `"a"` *func*) maps all of "m:a" and "ESC;a" to *func*.

- (`keymap:make-meta-prefix-list` *key*) ⇒ (listof string)
  key : string

`keymap:send-map-function-meta`

Most keyboard and mouse mappings are inserted into a keymap by calling the keymap's `map-function` method. However, "meta" combinations require special attention. The "m:" prefix recognized by `map-function` applies only to the Meta key that exists on some keyboards. By convention, however, "meta" combinations can also be accessed by using "ESC" as a prefix.

- (`keymap:send-map-function-meta` *keymap* *key* *func*) ⇒ void
  keymap : (instance `keymap%`)
  key : string
  func : (TST (instance `key-event%`) -¿ boolean)

  This procedure binds all of the key-bindings obtained by prefixing *key* with a meta-prefix to *func* in *keymap*.

`keymap:setup-editor`

This sets up the input keymap with the bindings described in `keymap:get-editor`.

- (`keymap:setup-editor` *keymap*) ⇒ void
  keymap : (instance `keymap%`)

`keymap:setup-file`

This extends a `keymap%` with the bindings for files.

- (`keymap:setup-file` *keymap*) ⇒ void
  keymap : (instance `keymap%`)

`keymap:setup-global`

This extends a `keymap%` with the general bindings.

This function extends a `keymap%` with the following functions:

- "ring-bell" (*any events*) — Rings the bell (using `bell`) and removes the search panel from the frame, if there.
- "save-file" (*key events*) — Saves the buffer. If the buffer has no name, then `finder:put-file` is invoked.
- "save-file-as" (*key events*) — Calls `finder:put-file` to save the buffer.
- "load-file" (*key events*) — Invokes `finder:open-file`.

- "find-string" (*key events*) — Opens the search buffer at the bottom of the frame, unless it is already open, in which case it searches for the text in the search buffer.
- "find-string-reverse" (*key events*) — Same a "find-string", but in the reverse direction.
- "find-string-replace" (*key events*) — Opens a replace string dialog box.
- "toggle-anchor" (*key events*) — Turns selection-anchoring on or off.
- "center-view-on-line" (*key events*) — Centers the buffer in its display using the currently selected line.
- "collapse-space" (*key events*) — Collapses all non-return whitespace around the caret into a single space.
- "remove-space" (*key events*) — Removes all non-return whitespace around the caret.
- "collapse-newline" (*key events*) — Collapses all empty lines around the caret into a single empty line. If there is only one empty line, it is removed.
- "open-line" (*key events*) — Inserts a new line.
- "transpose-chars" (*key events*) — Transposes the characters before and after the caret and moves forward one position.
- "transpose-words" (*key events*) — Transposes words before and after the caret and moves forward one word.
- "capitalize-word" (*key events*) — Changes the first character of the next word to a capital letter and moves to the end of the word.
- "upcase-word" (*key events*) — Changes all characters of the next word to capital letters and moves to the end of the word.
- "downcase-word" (*key events*) — Changes all characters of the next word to lowercase letters and moves to the end of the word.
- "kill-word" (*key events*) — Kills the next word.
- "backward-kill-word" (*key events*) — Kills the previous word.
- "goto-line" (*any events*) — Queries the user for a line number and moves the caret there.
- "goto-position" (*any events*) — Queries the user for a position number and moves the caret there.
- "copy-clipboard" (*mouse events*) — Copies the current selection to the clipboard.
- "cut-clipboard" (*mouse events*) — Cuts the current selection to the clipboard.
- "paste-clipboard" (*mouse events*) — Patses the clipboard to the current selection.
- "copy-click-region" (*mouse events*) — Copies the region between the caret and the input mouse event.
- "cut-click-region" (*mouse events*) — Cuts the region between the caret and the input mouse event.
- "paste-click-region" (*mouse events*) — Pastes the clipboard into the position of the input mouse event.
- "select-click-word" (*mouse events*) — Selects the word under the input mouse event.
- "select-click-line" (*mouse events*) — Selects the line under the input mouse event.
- "start-macro" (*key events*) – Starts building a keyboard macro
- "end-macro" (*key events*) — Stops building a keyboard macro
- "do-macro" (*key events*) — Executes the last keyboard macro
- "toggle-overwrite" (*key events*) — Toggles overwriting mode

These functions are bound to the following keys (C = control, S = shift, A = alt, M = "meta", D = command):

- C-g : "ring-bell"
- M-C-g : "ring-bell"
- C-c C-g : "ring-bell"
- C-x C-g : "ring-bell"
- C-p : "previous-line"
- S-C-p : "select-previous-line"
- C-n : "next-line"
- S-C-n : "select-next-line"
- C-e : "end-of-line"
- S-C-e : "select-to-end-of-line"
- D-RIGHT : "end-of-line"
- S-D-RIGHT : "select-to-end-of-line"

- M-RIGHT : “end-of-line”
- S-M-RIGHT : “select-to-end-of-line”
- C-a : “beginning-of-line”
- S-C-a : “select-to-beginning-of-line”
- D-LEFT : “beginning-of-line”
- D-S-LEFT : “select-to-beginning-of-line”
- M-LEFT : “beginning-of-line”
- M-S-LEFT : “select-to-beginning-of-line”
- C-h : “delete-previous-character”
- C-d : “delete-next-character”
- C-f : “forward-character”
- S-C-f : “select-forward-character”
- C-b : “backward-character”
- S-C-b : “select-backward-character”
- M-f : “forward-word”
- S-M-f : “select-forward-word”
- A-RIGHT : “forward-word”
- A-S-RIGHT : “forward-select-word”
- M-b : “backward-word”
- S-M-b : “select-backward-word”
- A-LEFT : “backward-word”
- A-S-LEFT : “backward-select-word”
- M-d : “kill-word”
- M-DELETE : “backward-kill-word”
- M-c : “capitalize-word”
- M-u : “upcase-word”
- M-l : “downcase-word”
- M-< : “beginning-of-file”
- S-M-< : “select-to-beginning-of-file”
- M-> : “end-of-file”
- S-M-> : “select-to-end-of-file”
- C-v : “next-page”
- S-C-v : “select-next-page”
- M-v : “previous-page”
- S-M-v : “select-previous-page”
- C-l : “center-view-on-line”
- C-k : “delete-to-end-of-line”
- C-y : “paste-clipboard” (Except Windows)
- A-v : “paste-clipboard”
- D-v : “paste-clipboard”
- C-_ : “undo”
- C-x u : “undo”
- C-+ : “redo”
- C-w : “cut-clipboard”
- M-w : “copy-clipboard”
- C-x C-s : “save-file”
- C-x C-w : “save-file-as”
- C-x C-f : “load-file”
- C-s : “find-string”
- C-r : “find-string-reverse”
- M-% : “find-string-replace”
- SPACE : “collapse-space”
- M-\ : “remove-space”
- C-x C-o : “collapse-newline”

- C-o : “open-line”
- C-t : “transpose-chars”
- M-t : “transpose-words”
- C-SPACE : “toggle-anchor”
- M-g : “goto-line”
- M-p : “goto-position”
- LEFTBUTTONTRIPLE : “select-click-line”
- LEFTBUTTONDOUBLE : “select-click-word”
- RIGHTBUTTON : “copy-click-region”
- RIGHTBUTTONDOUBLE : “cut-click-region”
- MIDDLEBUTTON : “paste-click-region”
- C-RIGHTBUTTON : “copy-clipboard”
- INSERT : “toggle-overwrite”
- M-o : “toggle-overwrite”

- `(keymap:setup-global` *keymap*`)` ⇒ void
  keymap : (instance `keymap%`)

`keymap:setup-search`

This extends a `keymap%` with the bindings for searching.

- `(keymap:setup-search` *keymap*`)` ⇒ void
  keymap : (instance `keymap%`)

17. Keys

17.1 Keys Utilities

`keys:get-shifted-key-list`

- `(keys:get-shifted-key-list)` ⇒ (listof string)

  This returns a list of the keys that are typed using shift.

  It returns:

  ```
  (list "?" ":" "~" "\"" "|"
        "<" ">" "{" "}" "[" "]" "(" ")"
        "!" "@" "#" "$" "%" "^" "&" "*" "_" "+")
  ```

  This is not specific to a particular keyboard, but it should be.

18. Main

19. Match Cache

19.1 match-cache:%

This class defines a cache that can be used with `paren:backward-match` and `paren:forward-match`. The cache data is intended to be inserted and read only by the matching procedures; however, the cache must be specifically invalidated when the cache's buffer is modified.

A cache is not required by the matching procedures. A single cache can only be used for a single buffer and with a single direction and parenthesis, quote, and comment parameterization. When a cache is used for a buffer, it does not have to be used with every call to the matching procedures, but the best results are obtained when the cache is always used. Multiple caches can be used for a single buffer (possibly for different directions or parenthesis parameterizations), as long as they are all invalidated properly when the buffer is modified.

A text's `after-insert` and `after-delete` methods can be overridden to properly track modifications and invoke a cache's `invalidate` or `forward-invalidate` methods.

`contents`

UNDOCUMENTED

- `(send` *a-match-cache:* `contents)` ⇒ void

`delete`

UNDOCUMENTED

- `(send` *a-match-cache:* `delete)` ⇒ void

`forward-invalidate`

- `(send` *a-match-cache:* `forward-invalidate` *pos*`)` ⇒ void
  pos : integer

  Call this method when text is inserted or deleted at position *pos* in the cache's buffer and the cache is used for forward-matching.

`get`

UNDOCUMENTED

- `(send` *a-match-cache:* `get)` ⇒ void

`invalidate`

- (send *a-match-cache:* `invalidate` *pos*) ⇒ void
  pos : integer

  Call this method when text is inserted or deleted at position *pos* in the cache's buffer and the cache is used for backward-matching.

`max-count`

UNDOCUMENTED

- (send *a-match-cache:* `max-count`) ⇒ void

`put`

UNDOCUMENTED

- (send *a-match-cache:* `put`) ⇒ void

`splay`

UNDOCUMENTED

- (send *a-match-cache:* `splay`) ⇒ void

`sum`

UNDOCUMENTED

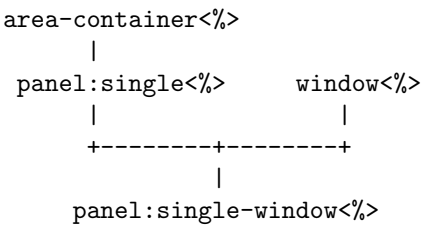
- (send *a-match-cache:* `sum`) ⇒ void

`times`

UNDOCUMENTED

- (send *a-match-cache:* `times`) ⇒ void

20. Panel



20.1 panel:single<%>

Extends: area-container<%>

See panel:single-mixin%.

active-child

- (send *a-panel:single* active-child *child*) ⇒ void
  child : (implements area<%>)

  Sets the active child to be *child*

- (send *a-panel:single* active-child) ⇒ (implements area<%>)

  Returns the current active child.

20.2 panel:single-mixin

Domain: area-container<%>

Implements: panel:single<%>

Implements: area-container<%>

This mixin adds single panel functionality to an implementation of the area-container<%> interface.

Single panels place all of the children in the center of the panel, and allow make one child to be visible at a time. The active-child method controls which panel is currently active.

The show method is used to hide and show the children of a single panel.

`after-new-child`

This method is called after a new containee area is created with this area as its container. The new child is provided as an argument to the method.

- (send *a-panel:single-mixin* `after-new-child` *child*) ⇒ void
  child : `subarea<%>`

  Does nothing.

  Hides this child by calling

  ```
  (send child show #f)
  ```

  , unless this is the first child in which case it does nothing.

`container-size`

Called to determine the minimum size of a container. See Geometry Management, §2.2 in *PLT MrEd: Graphical Toolbox Manual* for more information.

- (send *a-panel:single-mixin* `container-size`) ⇒ (values exact-integer exact-integer)

  Returns the maximum width of all the children and the maximum height of all of the children.

`place-children`

Called to place the children of a container. See Geometry Management, §2.2 in *PLT MrEd: Graphical Toolbox Manual* for more information.

- (send *a-panel:single-mixin* `place-children`) ⇒ (listof (list exact-integer exact-integer exact-integer exact-integer))

  Returns the positions for single panels and panes.

20.3 panel:single-window<%>

Extends: `window<%>`

Extends: `panel:single<%>`

20.4 panel:single-window-mixin

Domain: `window<%>`

Domain: `panel:single<%>`

Implements: `panel:single-window<%>`

Implements: window<%>

Implements: panel:single<%>

container-size

Called to determine the minimum size of a container. See Geometry Management, §2.2 in *PLT MrEd: Graphical Toolbox Manual* for more information.

- (send *a-panel:single-window-mixin* container-size *info*) ⇒ (values exact-integer exact-integer)
  info : (list-of (list exact-integer exact-integer boolean boolean))

  Factors the border width into the size calculation.

20.5 panel:single% = (panel:single-window-mixin (panel:single-mixin panel%))

panel:single% = (panel:single-window-mixin (panel:single-mixin panel%))

- (make-object panel:single% *parent style*) ⇒ panel:single% object
  parent : frame%, dialog%, panel%, or pane% object
  style = null : list of symbols in '(border)

  If the 'border style is specified, the window is created with a thin border (only in this case, the client size of the panel may be less than its total size).

20.6 panel:single-pane% = (panel:single-mixin pane%)

panel:single-pane% = (panel:single-mixin pane%)

- (make-object panel:single-pane% *parent*) ⇒ panel:single-pane% object
  parent : frame%, dialog%, panel%, or pane% object

21. Parenthesis

MrEd provides general-purpose "parenthesis"-matching utilities that work on buffers. The utilities are paramerized with respect to:

- *parens* — Pairs (`cons` cells) of opening and closing bracket strings. These brackets can be nested and must be balanced. The opening and closing string do not have to be different.
- *quotes* — Pairs of opening and closing quote bracket strings. Within a pair of quotes, all other bracket, quote, and comment strings are ignored. Pairs of quote strings do not have to correspond to quotes in the language. For example, C comments using "/*" and "*/" are considered quotes for parenthesis-matching purposes.
- *comments* — A list of comment-starting strings. Comments of this form run until the end of the line.

A backslash (\) is assumed to be the (only) method for escaping parenthesis, quote, and comment markers. The parenthesis-balancing utilities are only guaranteed to act meaningfully when the starting position is outside quoted and commented expressions. When a pair of opening and closing brackets are not distinct, the actions on these brackets are only meaningful for searches starting outside the brackets.

21.1 Paren Utilities

`paren:backward-match`

- (`paren:backward-match` *text start end parens quotes comments containing? cache*) ⇒ (union integer #f)
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  parens : (listof (cons string string))
  quotes : (listof (cons string string))
  comments : (listof string)
  containing? = `#f` : boolean
  cache = `#f` : (union #f (instance `match-cache:%`))

  Returns the position in *text* that "opens" the text ending at *start*, or `#f` if no opening position is found (either because a parenthesis mis-match is discovered or the *end* boundary was reached). The match must occur before *end* (inclusive). Note that *start* > *end*, since *start* specifies the starting position of the search, not the earliest buffer position to be considered.

  Spaces immediately preceding *start* are skipped. If the text at *start* is a close parenthesis or close quote, then the matching position is the opening parenthesis or quote. If a comment immediately precedes *start*, then the comment is skipped as whitespace. If an opening parenthesis immediately precedes *start*, then the matching position is *start* - 1. Otherwise, the matching position is the first whitespace or parenthesis character before *start*.

  If *containing?* is not `#f`, then the matching procedure is modified as follows:

- Searching iterates backwards until some search fails. Then, the location of the last successful search is returned.
- If a mis-match is detected, then `#f` is returned.
- If there are no matches (and no mis-matches) before *start*, *start* itself is returned.

If *cache* is not `#f`, it must be an instance of `match-cache:%`. A cache object can be used to speed up successive calls to `paren:backward-match`. However, a buffer using a cache must call the cache's `invalidate` method when the buffer is modified. Different caches should be used for forward and backward matching. See section 19.1 for more information.

`paren:balanced?`

- (`paren:balanced?` *text start end parens quotes comments*) ⇒ boolean
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  parens : (listof (cons string string))
  quotes : (listof (cons string string))
  comments : (listof string)

Returns `#t` if the text in *text* between positions *start* and *end* is **balanced**. The text is balanced if there are no unclosed parenthses or quotes, there are no closing parentheses that do not match an open parenthesis, and there are no mis-matched parentheses.

This uses `paren:forward-match`.

`paren:forward-match`

- (`paren:forward-match` *text start end parens quotes comments cache*) ⇒ (union #f integer)
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  parens : (listof (cons string string))
  quotes : (listof (cons string string))
  comments : (listof string)
  cache : (union #f (instance `match-cache:%`))

This function returns the position in *text* that "closes" the text at *start*, or `#f` if no closing position is found (either because a parenthesis mis-match is discovered or the *end* boundary was reached). The match must occur before *end* (inclusive).

Spaces immediately following *start* are skipped. If the text at *start* is an open parenthesis or open quote, then the matching position is the closing parenthesis or quote. If a comment immediately follows *start*, it is skipped over as whitespace. If a closing parenthesis immediately follows *start* (after skipping whitespace), then `#f` is returned. Otherwise, the matching position is the position before the first whitespace, parenthesis, quote, or comment character after *start*.

If *cache* is not `#f`, it must be an instance of `match-cache:%`. A cache object can be used to speed up successive calls to `paren:forwardward-match`. However, a buffer using a cache must call the cache's `forward-invalidate` method when the buffer is modified. Different caches should be used for forward and backward matching. See section 19.1 for more information.

`paren:skip-whitespace`

- (`paren:skip-whitespace` *text pos dir*) ⇒ exact-integer
  text : (instance `text%`)

pos : exact-integer
dir : (union 'forward 'backward)

If *dir* is `'forward`, this returns the position of the first non-whitespace character in *text* after *pos*. If *dir* is `'backward`, it returns the first non-whitespace character before *pos*.

22. Pasteboard

22.1 pasteboard:basic% = (editor:basic-mixin pasteboard%)

```
pasteboard:basic% = (editor:basic-mixin pasteboard%)
```

- (make-object pasteboard:basic%) ⇒ pasteboard:basic% object
  The editor will not be displayed until it is attached to a editor-canvas% object or some other display.
  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.
  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

22.2 pasteboard:keymap% = (editor:keymap-mixin pasteboard:basic%)

```
pasteboard:keymap% = (editor:keymap-mixin pasteboard:basic%)
```

- (make-object pasteboard:keymap%) ⇒ pasteboard:keymap% object
  The editor will not be displayed until it is attached to a editor-canvas% object or some other display.
  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.
  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

22.3 pasteboard:file% = (editor:file-mixin pasteboard:keymap%)

```
pasteboard:file% = (editor:file-mixin pasteboard:keymap%)
```

- (make-object pasteboard:file%) ⇒ pasteboard:file% object
  The editor will not be displayed until it is attached to a editor-canvas% object or some other display.
  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.
  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

22.4 pasteboard:backup-autosave% = (editor:backup-autosave-mixin pasteboard:file%)

```
pasteboard:backup-autosave% = (editor:backup-autosave-mixin pasteboard:file%)
```

- (make-object pasteboard:backup-autosave%) ⇒ pasteboard:backup-autosave% object
  The editor will not be displayed until it is attached to a editor-canvas% object or some other display.
  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.
  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

22.5 pasteboard:info% = (editor:info-mixin pasteboard:backup-autosave%)

pasteboard:info% = (editor:info-mixin pasteboard:backup-autosave%)

- (make-object pasteboard:info%) ⇒ pasteboard:info% object
  The editor will not be displayed until it is attached to a editor-canvas% object or some other display.
  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.
  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

23. Pathname Utilities

23.1 Path-utils Utilities

`path-utils:generate-autosave-name`

- (`path-utils:generate-autosave-name` *filename*) ⇒ string
  filename : string

  Generates a name for an autosave file from *filename*.

`path-utils:generate-backup-name`

- (`path-utils:generate-backup-name` *filename*) ⇒ string
  filename : string

  Generates a name for a backup file from *filename*.

24. Preferences

The framework provides a user preferences manager. It provides facilities for getting, setting, marshalling and unmarshalling the user's preferences as well as utilities to manage a preferences dialog box.

In addition to the functions @flink preferences:add-general-panel , and @flink preferences:add-font-panel listed here, @flink scheme:add-preferences-panel also adds panels to the preferences dialog.

24.1 Preferences Utilities

`preferences:add-callback`

- (`preferences:add-callback` *p f*) ⇒ (-¿ void)
  p : symbol
  f : (symbol TST -¿ boolean)

  This function adds a callback which is called with a symbol naming a preference and it's value, when the preference changes. If the callback function returns `#f`, the preference is not changed. `preferences:add-callback` returns a thunk, which when invoked, removes the callback from this preference.

  The callbacks will be called in the order in which they were added.

  If you are adding a callback for a preference that requires marshalling and unmarshalling, you must set the marshalling and unmarshalling functions by calling `preferences:set-un/marshall` before adding a callback.

  This function raises `exn:unknown-preference` if the preference has not been set.

`preferences:add-font-panel`

Adds a font selection preferences panel to the preferences dialog.

- (`preferences:add-font-panel`) ⇒ void

`preferences:add-general-panel`

Adds a general preferences panel to the preferences dialog.

- (`preferences:add-general-panel`) ⇒ void

`preferences:add-panel`

- (`preferences:add-panel` *name f*) ⇒ void
  name : string
  f : ((instance `area-container<%>`) -¿ (instance `area-container<%>`))

`preferences:add-preference-panel` adds the result of f with name *name* to the preferences dialog box. f's result's parent must be f's argument.

`preferences:get`

See also `preferences:set-default`.

- (`preferences:get` *symbol*) ⇒ TST
  symbol : symbol

  `preferences:get` returns the value for the preference *symbol*. It raises `exn:unknown-preference` if the preference has not been set.

`preferences:hide-dialog`

This function hides the preferences dialog.

- (`preferences:hide-dialog`) ⇒ void

`preferences:read`

Reads the preferences from the preferences file and installs their values.

- (`preferences:read`) ⇒ void

`preferences:restore-defaults`

- (`preferences:restore-defaults`) ⇒ void

  (`preferences:restore-defaults`) restores the users's configuration to the default preferences.

`preferences:save`

- (`preferences:save`) ⇒ void

  (`preferences:save-user-preferences`) saves the user's preferences to disk, potentially marshalling some of the preferences.

`preferences:set`

- (`preferences:set` *symbol* *value*) ⇒ void
  symbol : symbol
  value : TST

  `preferences:set-preference` sets the preference *symbol* to *value*. This should be called when the users requests a change to a preference.

`preferences:set-default`

This function must be called every time your application starts up, before any call to `preferences:get`.

If you use `preferences:set-un/marshall`, you must also call it before calling this function.

- (preferences:set-default *symbol value test*) ⇒ void
  symbol : symbol
  value : TST
  test : (TST -¿ boolean)

  This sets the default value of the preference *symbol* to *value*. If the user has chosen a different setting, the user's setting will take precedence over the default value.

  The last argument, *test* is used as a safeguard. That function is called to determine if a preference read in from a file is a valid preference. If *test* returns `#t`, then the preference is treated as valid. If *test* returns `#f` then the default is used.

  If there is a site-wide default preferences file, the default preference in that file is used instead of *value*.

`preferences:set-un/marshall`

- (preferences:set-un/marshall *symbol marshall unmarshall*) ⇒ void
  symbol : symbol
  marshall : (TST -¿ printable)
  unmarshall : (printable -¿ TST)

  `preference:set-un/marshall` is used to specify marshalling and unmarshalling functions for the preference *symbol*. *marshall* will be called when the users saves their preferences to turn the preference value for *symbol* into a printable value. *unmarshall* will be called when the user's preferences are read from the file to transform the printable value into it's internal representation. If `preference:set-un/marshall` is never called for a particular preference, the values of that preference are assumed to be printable.

  `preference:set-un/marshall` must be called before calling `preferences:get%` or `preferences:set-default%`.

`preferences:show-dialog`

This function shows the preferences dialog.

- (preferences:show-dialog) ⇒ void

25. Scheme

25.1 scheme:text<%>

Texts matching this interface support Scheme mode operations.

backward-sexp

Move the caret backwards one sexpression

- (send *a-scheme:text* backward-sexp *start-pos*) ⇒ void
  start-pos : exact-integer

  Moves the caret to the beginning of the sexpression that ends at *start-pos*.

balance-parens

This function is called when the user types a close parenthesis in the text%. If the close parenthesis that the user inserted does not match the corresponding open parenthesis and the 'framework:fixup-parens preference is #t (see preferences:get) the correct closing parenthesis is inserted. If the 'framework:paren-match preference is #t (see preferences:get) the matching open parenthesis is flashed.

- (send *a-scheme:text* balance-parens *key-event*) ⇒ void
  key-event : (instance key-event%)

balance-quotes

This function is called when the user types a quote in the text%. If the 'framework:paren-match preference is #t (see preferences:get) the matching open quote is flashed.

- (send *a-scheme:text* balance-quotes *key-event*) ⇒ void
  key-event : (instance key-event%)

comment-out-selection

- (send *a-scheme:text* comment-out-selection *start end*) ⇒ void
  start : exact-integer
  end : exact-integer

  Comments the lines containing positions *start* through *end* by inserting a semi-colon at the front of each line.

`down-sexp`

- (`send` *a-scheme:text* `down-sexp` *start*) ⇒ void
  start : exact-integer

  Moves forward into the next S-expression after the position *start*.

`find-down-sexp`

- (`send` *a-scheme:text* `find-down-sexp` *start-pos*) ⇒ (union #f exact-integer)
  start-pos : exact-integer

  Returns the position of the beginning of the next sexpression inside the sexpression that contains *start-pos*. If there is no such sexpression, it returns `#f`.

`find-up-sexp`

- (`send` *a-scheme:text* `find-up-sexp` *start-pos*) ⇒ (union #f exact-integer)
  start-pos : exact-integer

  Returns the position of the beginning of the next sexpression outside the sexpression that contains *start-pos*. If there is no such sexpression, it returns `#f`.

`flash-backward-sexp`

- (`send` *a-scheme:text* `flash-backward-sexp` *start-pos*) ⇒ void
  start-pos : exact-integer

  Flashes the parenthesis that opens the sexpression at *start-pos*.

`flash-forward-sexp`

- (`send` *a-scheme:text* `flash-forward-sexp` *start-pos*) ⇒ void
  start-pos : exact-integer

  Flashes the parenthesis that closes the sexpression at *start-pos*.

`forward-sexp`

- (`send` *a-scheme:text* `forward-sexp` *start*) ⇒ exact-integer
  start : #t

  Moves forward over the S-expression starting at position *start*.

`get-backward-sexp`

- (`send` *a-scheme:text* `get-backward-sexp` *start*) ⇒ (union exact-integer #f)
  start : exact-integer

  Returns the position of the start of the S-expression before or containing *start*, or `#f` if there is no appropriate answer.

`get-forward-sexp`

- (`send` *a-scheme:text* `get-forward-sexp` *start*) ⇒ (union #f exact-integer)
  start : exact-integer

Returns the position of the end of next S-expression after position *start*, or `#f` if there is no appropriate answer.

`get-limit`

- `(send` *a-scheme:text* `get-limit` *start*`)` ⇒ int
  start : exact-integer

  Returns a limit for backward-matching parenthesis starting at position *start*.

`get-tab-size`

This method returns the current size of the tabs for scheme mode. See also `set-tab-size`.

- `(send` *a-scheme:text* `get-tab-size)` ⇒ exact-integer

`highlight-parens`

- `(send` *a-scheme:text* `highlight-parens` *just-clear?*`)` ⇒ void
  just-clear? = `#f` : boolean

  When the current position is at the beginning or the end of an sexpression, this method highlights the sexpression.

`insert-return`

- `(send` *a-scheme:text* `insert-return)` ⇒ void

  Inserts a newline into the buffer. If `tabify-on-return?` returns `#t`, this will tabify the new line.

`remove-parens-forward`

- `(send` *a-scheme:text* `remove-parens-forward` *start*`)` ⇒ void
  start : exact-integer

  Removes the parentheses from the S-expression starting after the position *start*.

`remove-sexp`

- `(send` *a-scheme:text* `remove-sexp` *start*`)` ⇒ void
  start : exact-integer

  Forward-deletes the S-expression starting after the position *start*.

`select-backward-sexp`

- `(send` *a-scheme:text* `select-backward-sexp` *start*`)` ⇒ #t
  start : exact-integer

  Selects the previous S-expression, starting at position *start*.

`select-down-sexp`

- (`send` *a-scheme:text* `select-down-sexp` *start*) ⇒ #t
  start : exact-integer

  Selects the region to the next contained S-expression, starting at position *start*.

`select-forward-sexp`

- (`send` *a-scheme:text* `select-forward-sexp` *start*) ⇒ #t
  start : exact-integer

  Selects the next S-expression, starting at position *start*.

`select-up-sexp`

- (`send` *a-scheme:text* `select-up-sexp` *start*) ⇒ #t
  start : exact-integer

  Selects the region to the enclosing S-expression, starting at position *start*.

`set-tab-size`

This method sets the tab size for this text.

- (`send` *a-scheme:text* `set-tab-size` *new-size*) ⇒ void
  new-size : exact-integer

`tabify`

- (`send` *a-scheme:text* `tabify` *start-pos*) ⇒ void
  start-pos = (`send this get-start-position`) : exact-integer

  Tabs the line containing by *start-pos*

`tabify-all`

- (`send` *a-scheme:text* `tabify-all`) ⇒ void

  Tabs all lines.

`tabify-on-return?`

The result of this method is used to determine if the return key automatically tabs over to the correct position.

Override it to change it's behavior.

- (`send` *a-scheme:text* `tabify-on-return?`) ⇒ boolean

`tabify-selection`

- (`send` *a-scheme:text* `tabify-selection` *start end*) ⇒ void

start : exact-integer
end : exact-integer

Sets the tabbing for the lines containing positions *start* through *end*.

`transpose-sexp`

- (`send` *a-scheme:text* `transpose-sexp` *start*) ⇒ void
  start : exact-integer

  Swaps the S-expression beginning before the position *start* with the next S-expression following *start*.

`uncomment-selection`

- (`send` *a-scheme:text* `uncomment-selection` *start* *end*) ⇒ void
  start : int
  end : int

  Uncomments the lines containing positions *start* through *end*.

`up-sexp`

- (`send` *a-scheme:text* `up-sexp` *start*) ⇒ void
  start : exact-integer

  Moves backward out of the S-expression containing the position *start*.

25.2 `scheme:text-mixin`

Domain: `text:basic<%>`

Implements: `scheme:text<%>`

Implements: `text:basic<%>`

This mixin adds functionality for editing Scheme files.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`after-change-style`

Called after the style is changed for a given range (and after the display is refreshed; use `on-change-style` and `begin-edit-sequence` to avoid extra refreshes when `after-change-style` modifies the editor).

See also `can-change-style?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- (`send` *a-scheme:text-mixin* `after-change-style` *start* *len*) ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

This calls `end-edit-sequence` and updates the parenthesis hightlight. See `highlight-parens`.

`after-delete`

Called after a given range is deleted from the editor (and after the display is refreshed; use `on-delete` and `begin-edit-sequence` to avoid extra refreshes when `after-delete` modifies the editor).

See also `can-delete?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- (`send` *a-scheme:text-mixin* `after-delete` *start end*) ⇒ void
  start : exact non-negative integer
  end : exact non-negative integer

  The *start* argument specifies the starting position of the deleted range. The *len* argument specifies number of deleted items (so *start* + *length* is the endig position of the deleted range).

  This calls `end-edit-sequence` and updates the parenthesis hightlight. See `highlight-parens`.

`after-edit-sequence`

Called after a top-level edit sequence completes (involving unnested `begin-edit-sequence` and `end-edit-sequence`).

See also `on-edit-sequence`.

- (`send` *a-scheme:text-mixin* `after-edit-sequence`) ⇒ void

  This updates the parenthesis hightlight. See `highlight-parens`.

`after-insert`

Called after items are inserted into the editor (and after the display is refreshed; use `on-insert` and `begin-edit-sequence` to avoid extra refreshes when `after-insert` modifies the editor).

See also `can-insert?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- (`send` *a-scheme:text-mixin* `after-insert` *start len*) ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

  The *start* argument specifies the position of the insert. The *len* argument specifies the total length (in positions) of the inserted items.

  This calls `end-edit-sequence` and updates the parenthesis hightlight. See `highlight-parens`.

`after-set-position`

Called after the start and end position have been moved (but not when the position is moved due to inserts or deletes).

See also `on-edit-sequence`.

- `(send` *a-scheme:text-mixin* `after-set-position)` ⇒ void

  This calls `end-edit-sequence` and updates the parenthesis hightlight. See `highlight-parens`.

`after-set-size-constraint`

Called after the editor's maximum or minimum height or width is changed (and after the display is refreshed; use `on-set-size-constraint` and `begin-edit-sequence` to avoid extra refreshes when `after-set-size-constraint` modifies the editor).

(This callback method is provided because setting an editor's maxmimum width may cause lines to be re-flowed with soft carriage returns.)

See also `can-set-size-constraint?` and `on-edit-sequence`.

- `(send` *a-scheme:text-mixin* `after-set-size-constraint)` ⇒ void

  This calls `end-edit-sequence` and updates the parenthesis hightlight. See `highlight-parens`.

`on-focus`

Called when the keyboard focus changes into or out of this editor (and not to/from a snip within the editor) with `#t` if the focus is being turned on, `#f` otherwise.

- `(send` *a-scheme:text-mixin* `on-focus` *on?*`)` ⇒ boolean
  on? : boolean

  This calls `begin-edit-sequence`.

25.3 `scheme:text% = (scheme:text-mixin text:info%)`

`scheme:text% = (scheme:text-mixin text:info%)`

- `(make-object scheme:text%` *line-spacing tabstops*`)` ⇒ `scheme:text%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

25.4 Scheme Utilities

`scheme:add-preferences-panel`

Adds a tabbing preferences panel to the preferences dialog.

- `(scheme:add-preferences-panel)` ⇒ void

`scheme:get-keymap`

Returns a keymap with binding suitable for Scheme.

- `(scheme:get-keymap)` ⇒ (instance `keymap%`)

`scheme:get-style-list`

Returns a style list that is used for all Scheme buffers.

- `(scheme:get-style-list)` ⇒ (instance `style-list%`)

`scheme:get-wordbreak-map`

This method returns a `editor-wordbreak-map%` that is suitable for Scheme.

- `(scheme:get-wordbreak-map)` ⇒ (instance `editor-wordbreak-map%`)

`scheme:init-wordbreak-map`

- `(scheme:init-wordbreak-map` *key*`)` ⇒ void
  key : (instance `keymap%`)

  Initializes the workdbreak map for *keymap*.

`scheme:setup-keymap`

- `(scheme:setup-keymap` *keymap*`)` ⇒ void
  keymap : (instance `keymap%`)

26. Scheme Parenthesis

26.1 Scheme-paren Utilities

`scheme-paren:backward-containing-sexp`

- (`scheme-paren:backward-containing-sexp` *text start end cache*) ⇒ exact-integer
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  cache : (union #f (instance `match-cache:%`))

  Returns the beginning of the interior of the (non-atomic) S-expression containing *start*.

`scheme-paren:backward-match`

Specializes `paren:backward-match` to Scheme.

- (`scheme-paren:backward-match` *text start end cache*) ⇒ exact-integer
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  cache = `#f` : (union #f (instance `match-cache:%`))

`scheme-paren:balanced?`

Specializes `paren:balanced?` to Scheme.

- (`scheme-paren:balanced?` *text start end*) ⇒ boolean
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer

`scheme-paren:forward-match`

Specializes `paren:forward-match` to Scheme.

- (`scheme-paren:forward-match` *text start end cache*) ⇒ (union #f integer)
  text : (instance `text%`)
  start : exact-integer
  end : exact-integer
  cache : (union #f (instance `match-cache:%`))

`scheme-paren:get-comments`

Returns the comment characters for Scheme.

- `(scheme-paren:get-comments)` ⇒ (listof string)

`scheme-paren:get-paren-pairs`

Returns the paren pairs for Scheme.

- `(scheme-paren:get-paren-pairs)` ⇒ (listof (cons string string))

`scheme-paren:get-quote-pairs`

Returns the quote pairs for Scheme.

- `(scheme-paren:get-quote-pairs)` ⇒ (listof (cons string string))

27. Test

The framework provides several new primitive functions that simulate user actions, which may be used to test applications. You use these primitives and combine them just as regular MzScheme functions. For example,

```
(begin
  (test:keystroke #\A)
  (test:menu-select "File" "Save"))
```

sends a keystroke event to the window with the keyboard focus and invokes the callback function for the "Save" menu item from the "File" menu. This has the same effect as if the user typed the key "A", pulled down the "File" menu and selected "Save".

It is possible to load this portion of the framework without loading the rest of the framework. See section **??** for more details.

Currently, the test engine has primitives for pushing buttons, setting check-boxes and choices, sending keystrokes, selecting menu items and clicking the mouse. Many functions that are also useful in application testing, such as traversing a tree of panels, getting the text from a canvas, determining if a window is shown, and so on, exist in MrEd.

27.1 An example

Here is an example program that enters a factorial procedure and computes `(fact 4)`. To run this program, start DrScheme, click on the "Console" button, load this program and run `(go)`. Then bring the DrScheme window to the front and click the mouse in the DrScheme window.

```
(define go
  (lambda ()
    (sleep 3)
    (test:new-window (get-panel '(0 0 0 1)))       ; definitions canvas
    (test:menu-select "Edit" "Select All")
    (test:menu-select "Edit" "Delete")
    (type-line "(define fact")
    (type-line "(lambda (n)")
    (type-line "(if (zero? n)")
    (type-line "1")
    (type-line "(* n (fact (sub1 n))))))")
    (test:button-push (get-panel '(0 0 0 0 5 0)))  ; check-syntax button
    (test:button-push (get-panel '(0 0 0 0 5 3)))  ; execute button
    (sleep 3)
    (type-line "(fact 4)")
    (sleep 1)
    (printf "Test complete. Pending actions: ~s~n"
            (test:number-pending-actions))))
```

```
(define type-line
  (lambda (str)
    (for-each test:keystroke (string->list str))
    (test:keystroke #\return)))

(define get-panel
  (lambda (path)
    (let loop ([path  path]
               [panel (send (test:get-active-frame) get-top-panel)])
      (if (null? path)
          panel
          (loop (cdr path)
                (list-ref (ivar panel children) (car path)))))))
```

27.2 Actions and completeness

The actions associated with a testing primitive may not have finished when the primitive returns to its caller. Some actions may yield control before they can complete. For example, selecting "Save As..." from the "File" menu opens a dialog box and will not complete until the "OK" or "Cancel" button is pushed.

However, all testing functions wait at least a minimum interval before returning to give the action a chance to finish. This interval controls the speed at which the test suite runs, and gives some slack time for events to complete. The default interval is 100 milliseconds. The interval can be queried or set with `test:run-interval`.

A primitive action will not return until the run-interval has expired and the action has finished, raised an error, or yielded. The number of incomplete actions is given by `test:number-pending-actions`.

Note: Once a primitive action is started, it is not possible to undo it or kill its remaining effect. Thus, it is not possible to write a utility that flushes the incomplete actions and resets number-pending-actions to zero.

However, actions which do not complete right away often provide a way to cancel themselves. For example, many dialog boxes have a "Cancel" button which will terminate the action with no further effect. But this is accomplished by sending an additional action (the button push), not by undoing the original action.

27.3 Errors

Errors in the primitive actions (which necessarily run in the handler thread) are caught and reraised in the calling thread.

However, the primitive actions can only guarantee that the action has started, and they may return before the action has completed. As a consequence, an action may raise an error long after the function that started it has returned. In this case, the error is saved and reraised at the first opportunity (the next primitive action).

The test engine keeps a buffer for one error, saving only the first error. Any subsequent errors are discarded. Reraising an error empties the buffer, allowing the next error to be saved.

The function `test:reraise-error` reraises any pending errors.

27.4 Technical Issues

Active Frame

The Self Test primitive actions all implicitly apply to the top-most (active) frame.

Thread Issues

The code started by the primitive actions must run in the handler thread of the eventspace where the event takes place. As a result, the test suite that invokes the primitive actions must *not* run in that handler thread (or else some actions will deadlock). See see section 2.4 for more info.

Window Manager (Unix only)

In order for the Self Tester to work correctly, the window manager must set the keyboard focus to follow the active frame. This is the default behavior in Microsoft Windows and MacOS, but not in X windows.

In X windows, you must explicitly tell your window manager to set the keyboard focus to the top-most frame, regardless of the position of the actual mouse. Some window managers may not implement such functionality. You can obtain such an effect in Fvwm and Fvwm95 by using the option:

```
Style  "*"  ClickToFocus
```

27.5 Known Problems

The following are known problems or not yet implemented.

1. Support for listboxes, sliders and radioboxes has not been implemented.
2. Support for mouse dragging and double clicking has not been implemented.
3. Using `test:menu-select` for check-boxes on menu bars (for example, "Show" in DrScheme) does not work.
4. The parameterization for the DrScheme console REPL is shared with the handler thread. As a result, some errors in the main thread are not handled correctly. The simplest solution is to reset the error handler in the test suite with:

   ```
   (current-error-handler (current-error-handler))
   ```

5. Sending keystrokes to a `mred:text%` window converts everything to upper case.

27.6 Test Utilities

`test:button-push`

- (`test:button-push` *button*) ⇒ void
  button : (union (instance `button%`) string)

  Simulates pushing *button*. If a string is supplied, the primitive searches for a button labelled with that string in the active frame. Otherwise, it pushes the button argument.

`test:close-top-level-window`

Use this function to simulate clicking on the close box of a frame.

- (test:close-top-level-window *frame*) ⇒ void
  frame : (instance frame%)

  Closes *frame* with this expression:

```
(when (send frame can-close?)
  (send frame on-close)
  (send frame show #f))
```

test:current-get-eventspaces

This parameter that specifies which eventspace (see section 2.4) are considered when finding the frontmost frame.

- (test:current-get-eventspaces *func*) ⇒ void
  func : (-¿ (listof eventspace))

  Sets the parameter to *func*. The procedure *func* will be invoked with no arguments to determine the eventspaces to consider when finding the frontmost frame for simulated user events.

- (test:current-get-eventspaces) ⇒ (-¿ (listof eventspace))

  Returns the current value of the parameter. This will be a procedure which, when invoked, returns a list of eventspaces.

test:keystroke

- (test:keystroke *key* *modifier-list*) ⇒ void
  key : (union char symbol)
  modifier-list = null : (listof (union 'alt 'control 'meta 'shift 'noalt 'nocontrol 'nometa 'noshift))

  This function simulates a user pressing a key. The argument, *key*, is just like the argument to the get-key-code method of the key-event% class.

  Note: To send the "Enter" key, use #\return, not #\newline.

  The 'shift or 'noshift modifier is implicitly set from *key*, but is overridden by the argument list. The 'shift modifier is set for any capitol alpha-numeric letters and any of the characters returned by keys:get-shifted-key-list.

  If conflicting modifiers are provided, the ones later in the list are used.

test:menu-select

- (test:menu-select *menu* *item*) ⇒ void
  menu : string
  item : string

  Selects the menu-item named *item* in the menu named *menu*.

  Note: The string for the menu item does not include its keyboard equivalent. For example, to select "New" from the "File" menu, use "New", not "New Ctrl+m n".

test:mouse-click

- (test:mouse-click *button* *x* *y* *modifiers*) ⇒ void
  button : (union 'left 'middle 'right)
  x : inexact

y : inexact
modifiers = `null` : (listof (union 'alt 'control 'meta 'shift 'noalt 'nocontrol 'nometa 'noshift))

Simulates a mouse click at the coordinate: (x, y) in the currently focused `window<%>`, assuming that it supports the `on-event` method. Use `test:button-push` to click on a button.

On the Macintosh, `'right` corresponds to holding down the command modifier key while clicking and `'middle` cannot be generated.

Under Windows, `'middle` can only be generated if the user has a three button mouse.

The modifiers later in the list *modifiers* take precedence over ones that appear earlier.

`test:new-window`

- (`test:new-window` *window*) ⇒ void
  window : (implements `window<%>`)

  Moves the keyboard focus to a new window within the currently active frame. Unfortunately, neither this function nor any other function in the test engine can cause the focus to move from the top-most (active) frame.

`test:number-pending-actions`

See also Actions and completeness, section 27.2.

- (`test:number-pending-actions`) ⇒ integer

  Returns the number of simulated events that have started but not yet completed. An error that has been caught but not yet reraised counts as an incomplete action. Thus, a result of zero implies that there is no pending error and no action is still running.

`test:reraise-error`

See also Errors, section 27.3.

- (`test:reraise-error`) ⇒ void

  Reraises any pending error or else returns `void`.

`test:run-interval`

See also Actions and completeness, section 27.2.

- (`test:run-interval` *msec*) ⇒ void
  msec : number

  Sets the run interval to *msec* milliseconds.

- (`test:run-interval`) ⇒ number

  Returns the current setting for the number of milliseconds.

`test:run-one`

- (`test:run-one` *f*) ⇒ void
  f : (-¿ void)

  Runs the function *f* as if it was a simulated event. See also section 27.

`test:set-check-box!`

- (`test:set-check-box!` *check-box state*) ⇒ void
  check-box : (union (instance `check-box%`) string)
  state : boolean

  Clears the `check-box%` item if *state* is `#f`, and sets it otherwise.

  If *check-box* is a string, this function searches for a `check-box%` with a label matching that string, otherwise it uses *check-box* itself.

`test:set-choice!`

- (`test:set-choice!` *choice str*) ⇒ void
  choice : (union (instance `choice%`) string)
  str : string

  Selects *choice*'s item *str*. If *choice* is a string, this function searches for a `choice%` with a label matching that string, otherwise it uses *choice* itself.

`test:set-radio-box!`

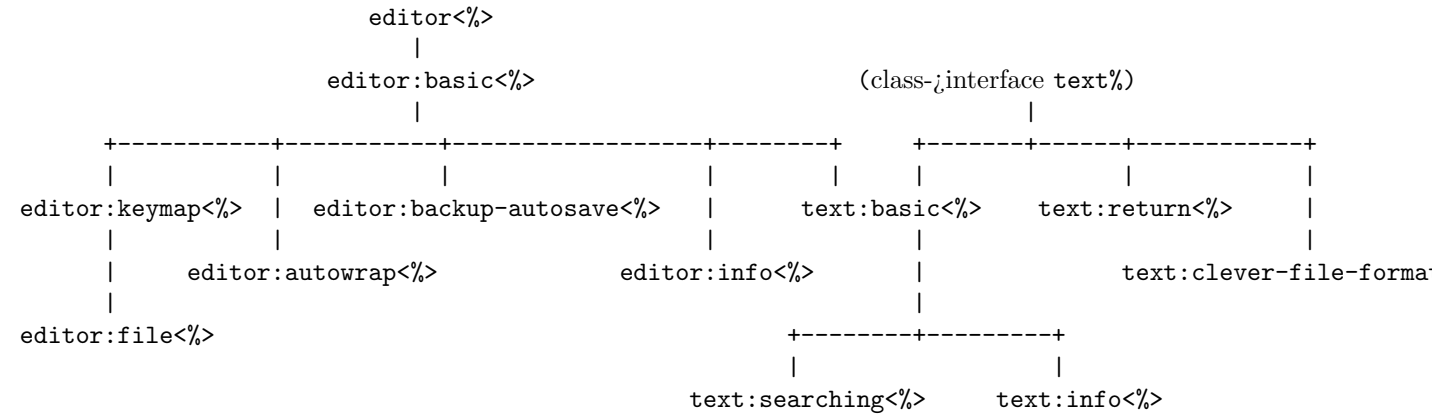
- (`test:set-radio-box!` *radio-box state*) ⇒ void
  radio-box : (union (instance `radio-box%`) string)
  state : boolean

  Clears the `radio-box%` item if *state* is `#f`, and sets it otherwise.

  If *check-box* is a string, this function searches for a `radio-box%` with a label matching that string, otherwise it uses *radio-box* itself.

28. Text

This is the interface hierarchy for the editor and text classes in the framework.



28.1 text:basic<%>

Extends: (class->interface text%)

Extends: editor:basic<%>

Classes matching this interface are expected to implement the basic functionality needed by the framework.

get-styles-fixed

If the result of this function is #t, the styles in this text% will be fixed. See also set-styles-fixed.

- (send *a-text:basic* get-styles-fixed) ⇒ boolean

highlight-range

This function highlights a region of text in the buffer.

- (send *a-text:basic* highlight-range *start end color bitmap caret-space priority*) ⇒ (-¿ void)
  start : exact-integer
  end : exact-integer
  color : (instance color%)

bitmap : (union #f (instance bitmap%))
caret-space = #f : boolean
priority = 'low : (union 'high 'low)

The range between *start* and *end* will be highlighted with the color in color, and *bitmap* will be painted over the range of text in black and white. If *bitmap* is #f, the range will be inverted, using the platform specific xor. This method is not recommended, because the selection is also displayed using xor.

If *caret-space?* is not #f, the left edge of the range will be one pixel short, to leave space for the caret. The caret does not interfere with the right hand side of the range. Note that under X windows the caret is drawn with XOR, which means almost anything can happen. So if the caret is in the middle of the range it may be hard to see, or if it is on the left of the range and *caret-space?* is #f it may also be hard to see.

The *priority* argument indicates the relative priority for drawing overlapping regions. If two regions overlap and have different priorities, the region with 'high priority will be drawn second and only it will be visible in the overlapping region.

This method returns a thunk, which, when invoked, will turn off the highlighting from this range.

`initial-autowrap-bitmap`

The result of this method is used as the initial autowrap bitmap. Override this method to change the initial bitmap%. See also set-autowrap-bitmap

- (send *a-text:basic* initial-autowrap-bitmap) ⇒ (union #f (instance bitmap%))
  Defaultly returns the result of icon:get-autowrap-bitmap

`move/copy-to-edit`

This moves or copies text and snips to another edit.

- (send *a-text:basic* move/copy-to-edit *dest-text start end dest-pos*) ⇒ void
  dest-text : (instance text%)
  start : exact-integer
  end : exact-integer
  dest-pos : exact-integer

  Moves or copies from the edit starting at *start* and ending at *end*. It puts the copied text and snips in *dest-text* starting at location *dest-pos*.

  If a snip refused to be moved, it will be copied, otherwise it will be moved. A snip may refuse to be moved by returning #f from release-from-owner.

`set-styles-fixed`

Sets the styles fixed parameter of this text%. See also get-styles-fixed.

- (send *a-text:basic* set-styles-fixed *fixed?*) ⇒ void
  fixed? : boolean

28.2 text:basic-mixin

Domain: editor:basic<%>

Domain: `(class->interface text%)`

Implements: `editor:basic<%>`

Implements: `text:basic<%>`

This mixin implements the basic functionality needed for `text%` objects in the framework.

The class that this mixin produces uses the same initialization arguments as it's input.

- `(make-object text:basic-mixin%` *line-spacing* *tabstops*`)` ⇒ `text:basic-mixin%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

`after-change-style`

Called after the style is changed for a given range (and after the display is refreshed; use `on-change-style` and `begin-edit-sequence` to avoid extra refreshes when `after-change-style` modifies the editor).

See also `can-change-style?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- `(send` *a-text:basic-mixin* `after-change-style` *start* *len*`)` ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

  See `set-styles-fixed`.

`after-insert`

Called after items are inserted into the editor (and after the display is refreshed; use `on-insert` and `begin-edit-sequence` to avoid extra refreshes when `after-insert` modifies the editor).

See also `can-insert?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- `(send` *a-text:basic-mixin* `after-insert` *start* *len*`)` ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

  The *start* argument specifies the position of the insert. The *len* argument specifies the total length (in positions) of the inserted items.

See set-styles-fixed.

on-change-style

Called before the style is changed in a given range of the editor, after can-change-style? is called to verify that the change is ok. The after-change-style method is guaranteed to be called after the change has completed.

The editor is internally locked for writing during a call to this method (see also section 8.8 (page 153)). Use after-change-style to modify the editor, if necessary.

See also on-edit-sequence.

- (send *a-text:basic-mixin* on-change-style *start len*) ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

  See set-styles-fixed.

on-paint

Provides a way to add arbitrary graphics to an editors's display. This method is called just before and just after every painting of the editor.

The on-paint method, together with the snips' draw methods, must be able to draw the entire state of an editor. Never paint directly into an editor's display canvas except from within on-paint or draw. Instead, put all extra drawing code within on-paint and call invalidate-bitmap-cache when part of the display needs to be repainted.

The on-paint method must not make any assumptions about the state of the drawing context (e.g., the current pen), except that the clipping region is already set to something appropriate. Before on-paint returns, it must restore any drawing context settings that it changes.

The editor is internally locked for writing and reflowing during a call to this method (see also section 8.8 (page 153)).

- (send *a-text:basic-mixin* on-paint *before? dc left top right bottom dx dy draw-caret*) ⇒ void
  before? : boolean
  dc : dc<%> object
  left : real number
  top : real number
  right : real number
  bottom : real number
  dx : real number
  dy : real number
  draw-caret : symbol in '(no-caret show-inactive-caret show-caret)

  The *before?* argument is #t when the method is called just before a painting the contents of the editor or #f when it is called after painting. The *left*, *top*, *right*, and *bottom* arguments specify which region of the editor is being repainted, in editor coordinates. To get the coordinates for *dc*, offset editor coordinates by adding (*dx*, *dy*). See section 8.5 (page 152) for information about *draw-caret*.

  See also invalidate-bitmap-cache.

  Draws the rectangles installed by highlight-range.

28.3 `text:searching<%>`

Extends: `text:basic<%>`

Extends: `editor:keymap<%>`

Any object matching this interface can be searched.

28.4 `text:searching-mixin`

Domain: `text:basic<%>`

Domain: `editor:keymap<%>`

Implements: `text:searching<%>`

Implements: `text:basic<%>`

Implements: `editor:keymap<%>`

This `text%` can be searched.

The result of this mixin uses the same initialization arguments as the mixin's argument.

`get-keymaps`

The keymaps returned from this method are chained to this `editor<%>`'s keymap.

- `(send` *a-text:searching-mixin* `get-keymaps)` ⇒ (list-of (instance `keymap%`))
  Defaultly returns `(list keymap:get-global)`
  This returns a list containing the super-class's keymaps, plus the result of `keymap:get-search`

28.5 `text:return<%>`

Extends: `(class->interface text%)`

Objects supporting this interface were created by `text:return-mixin`.

28.6 `text:return-mixin`

Domain: `(class->interface text%)`

Implements: text:return<%>

Use this buffer to perform some special action when return is typed.

- (make-object text:return-mixin% *return*) ⇒ text:return-mixin% object
  return : (-¿ boolean)

on-local-char

Called by on-char when the event is *not* handled by a caret-owning snip.

Consider overriding on-default-char instead of this method.

- (send *a-text:return-mixin* on-local-char *event*) ⇒ void
  event : key-event% object

  Either lets the keymap handle the event or calls on-default-char .

  If *key* is either return or newline, only invoke the *return* thunk (initialization argument) and do nothing else.

28.7 text:info<%>

Extends: text:basic<%>

Objects supporting this interface are expected to send information about themselves to the frame that is displaying them.

28.8 text:info-mixin

Domain: text:basic<%>

Domain: editor:keymap<%>

Implements: text:info<%>

Implements: text:basic<%>

Implements: editor:keymap<%>

This mixin adds support for supplying information to objects created with frame:info-mixin. When this editor:basic<%> is displayed in a frame, that frame must have been created with frame:info-mixin.

`after-delete`

Called after a given range is deleted from the editor (and after the display is refreshed; use `on-delete` and `begin-edit-sequence` to avoid extra refreshes when `after-delete` modifies the editor).

See also `can-delete?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- (`send` *a-text:info-mixin* `after-delete` *start end*) ⇒ void
  start : exact non-negative integer
  end : exact non-negative integer

  The *start* argument specifies the starting position of the deleted range. The *len* argument specifies number of deleted items (so *start* + *length* is the endig position of the deleted range).

  Calls the `editor-position-changed` method of the frame that is viewing this object. It uses `get-canvas` to get the canvas for this frame, and uses that canvas's `top-level-window<%>` as the frame.

`after-insert`

Called after items are inserted into the editor (and after the display is refreshed; use `on-insert` and `begin-edit-sequence` to avoid extra refreshes when `after-insert` modifies the editor).

See also `can-insert?` and `on-edit-sequence`.

No internals locks are set when this method is called.

- (`send` *a-text:info-mixin* `after-insert` *start len*) ⇒ void
  start : exact non-negative integer
  len : exact non-negative integer

  The *start* argument specifies the position of the insert. The *len* argument specifies the total length (in positions) of the inserted items.

  Calls the `editor-position-changed` method of the frame that is viewing this object. It uses `get-canvas` to get the canvas for this frame, and uses that canvas's `top-level-window<%>` as the frame.

`after-set-position`

Called after the start and end position have been moved (but not when the position is moved due to inserts or deletes).

See also `on-edit-sequence`.

- (`send` *a-text:info-mixin* `after-set-position`) ⇒ void

  Calls the `editor-position-changed` method of the frame that is viewing this object. It uses `get-canvas` to get the canvas for this frame, and uses that canvas's `top-level-window<%>` as the frame.

`set-anchor`

Turns anchoring on or off. This method can be overridden to affect or detect changes in the anchor state.

- (send *a-text:info-mixin* set-anchor *on?*) ⇒ void
  on? : boolean

  If *on?* is not #f, then the selection will be automatically extended when cursor keys are used, otherwise anchoring is turned off. Anchoring is automatically turned off if the user does anything besides cursor movements.

  Calls the anchor-status-changed method of the frame that is viewing this object. It uses get-canvas to get the canvas for this frame, and uses that canvas's top-level-window<%> as the frame.

set-overwrite-mode

Enables or disables overwrite mode. See get-overwrite-mode. This method can be overridden to affect or detect changes in the overwrite mode.

- (send *a-text:info-mixin* set-overwrite-mode *on?*) ⇒ void
  on? : boolean

  Calls the overwrite-status-changedmethod of the frame that is viewing this object. It uses get-canvas to get the canvas for this frame, and uses that's top-level-window<%> as the frame.

28.9 text:clever-file-format<%>

Extends: (class->interface text%)

Objects supporting this interface are expected to support a clever file format when saving.

28.10 text:clever-file-format-mixin

Domain: (class->interface text%)

Implements: text:clever-file-format<%>

The result of this mixin uses the same initialization arguments as the mixin's argument.

When files are saved from this text%, a check is made to see if there are any non-string-snip% objects in the text%. If so, it is saved using the file format 'std. (see set-file-format for more information. If not, the file format passed to save-file is used.

- (make-object text:clever-file-format-mixin% *line-spacing* *tabstops*) ⇒ text:clever-file-format-mixin% object
  line-spacing = 1.0 : non-negative real number
  tabstops = null : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See set-tabs for information about *tabstops*.

  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.

  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

`on-save-file`

Called just before the editor is saved to a file, after calling `can-save-file?` to verify that the save is allowed. See also `after-save-file`.

- `(send` *a-text:clever-file-format-mixin* `on-save-file` *filename format*`)` ⇒ void
  filename : string
  format : symbol in `'(guess standard text text-force-cr same copy)`

  The *filename* argument is the name the file will be saved to. See `load-file` for information about *format*.

  If the method `get-file-format` returns `'standard` and the text has only `string-snip%`s, the file format is set to `'text`.

  If the method `get-file-format` returns `'text` and the text has some non `string-snip%`s, the file format is set to `'standard`.

  Depending on the user's preferences, the user may also be queried.

  Also, the chagnes to the file format only happen if the argument *file-format* is `'copy` or `'same`.

28.11 `text:basic% = (text:basic-mixin (editor:basic-mixin text%))`

`text:basic% = (text:basic-mixin (editor:basic-mixin text%))`

- `(make-object text:basic%` *line-spacing tabstops*`)` ⇒ `text:basic%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

28.12 `text:keymap% = (editor:keymap-mixin text:basic%)`

`text:keymap% = (editor:keymap-mixin text:basic%)`

- `(make-object text:keymap%` *line-spacing tabstops*`)` ⇒ `text:keymap%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

28.13 text:return% = (text:return-mixin text:keymap%)

```
text:return% = (text:return-mixin text:keymap%)
```

- (make-object text:return% *line-spacing tabstops*) ⇒ text:return% object
  line-spacing = 1.0 : non-negative real number
  tabstops = null : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See set-tabs for information about *tabstops*.

  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.

  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

- (make-object text:return% *return*) ⇒ text:return% object
  return : (-¿ boolean)

28.14 text:autowrap% = (editor:autowrap-mixin text:keymap%)

```
text:autowrap% = (editor:autowrap-mixin text:keymap%)
```

- (make-object text:autowrap% *line-spacing tabstops*) ⇒ text:autowrap% object
  line-spacing = 1.0 : non-negative real number
  tabstops = null : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See set-tabs for information about *tabstops*.

  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.

  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

28.15 text:file% = (editor:file-mixin text:autowrap%)

```
text:file% = (editor:file-mixin text:autowrap%)
```

- (make-object text:file% *line-spacing tabstops*) ⇒ text:file% object
  line-spacing = 1.0 : non-negative real number
  tabstops = null : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See set-tabs for information about *tabstops*.

  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.

  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

28.16 `text:clever-file-format% = (text:clever-file-format-mixin text:file%)`

`text:clever-file-format% = (text:clever-file-format-mixin text:file%)`

- `(make-object text:clever-file-format%` *line-spacing tabstops*`)` ⇒ `text:clever-file-format%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

28.17 `text:backup-autosave% = (editor:backup-autosave-mixin text:clever-file-format%)`

`text:backup-autosave% = (editor:backup-autosave-mixin text:clever-file-format%)`

- `(make-object text:backup-autosave%` *line-spacing tabstops*`)` ⇒ `text:backup-autosave%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

28.18 `text:searching% = (text:searching-mixin text:backup-autosave%)`

`text:searching% = (text:searching-mixin text:backup-autosave%)`

- `(make-object text:searching%` *line-spacing tabstops*`)` ⇒ `text:searching%` object
  line-spacing = `1.0` : non-negative real number
  tabstops = `null` : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See `set-tabs` for information about *tabstops*.

  A new `keymap%` object is created for the new editor. See also `get-keymap` and `set-keymap`.

  A new `style-list` object is created for the new editor. See also `get-style-list` and `set-style-list`.

28.19 text:info% = (text:info-mixin (editor:info-mixin text:searching%))

```
text:info% = (text:info-mixin (editor:info-mixin text:searching%))
```

- (make-object text:info% *line-spacing tabstops*) ⇒ text:info% object
  line-spacing = 1.0 : non-negative real number
  tabstops = null : list of real numbers

  The *line-spacing* argument sets the additional amount of space (in DC units) inserted between each line in the editor when the editor is displayed. This spacing is included in the reported height of each line.

  See set-tabs for information about *tabstops*.

  A new keymap% object is created for the new editor. See also get-keymap and set-keymap.

  A new style-list object is created for the new editor. See also get-style-list and set-style-list.

29. Version

29.1 Version Utilities

`version:add-spec`

- (`version:add-spec` *spec revision*) ⇒ void
  spec : any scheme value
  revision : any scheme value

  These two values are appended to the version string. `write` is used to transform them to strings. For example:

  ```
  (version:add-version-spec 's 1)
  ```

  in version 45 will make the version string be `"45s1"`. The symbols `'f` and `'d` are used internally for framework and drscheme revisions.

`version:version`

This function returns a string describing the version of this application. See also `version:add-spec`.

- (`version:version`) ⇒ string

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