

# LiveCode 8.0.0-dp-6 Release Notes

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## Overview

LiveCode 8.0 is the most exciting release in the history of the technology. It provides a simple way to extend the functionality or control set of LiveCode.

Our focus in LiveCode 8.0 is extensibility. You can now build and share widgets (custom controls) and libraries that are treated by LiveCode as engine level elements.

LiveCode 8.0 can be thought of as a version 7.0 with a new module allowing extensions to be plugged into the engine. As a result, 8.0 should be as functional and stable as LiveCode 7.0.

I don't want to build extensions. What's in it for me?

Many love LiveCode because of the productivity benefits and don't have time to build extensions. If that is the case just kick back and start using LiveCode 8 and keep an eye on the extensions portal. You can start using new controls and libraries as they are built by other community members.

### LiveCode Script vs LiveCode Builder

To make it possible to create extensions and plug them into the LiveCode engine we've created a new flavour of our language called . LiveCode Builder looks a lot like LiveCode Script so should feel familiar for any seasoned LiveCode developer. There is lots of new syntax which exposes parts of the LiveCode engine that were only previously available to those who were skilled c/c++ developers.

LiveCode Builder is a new language and is therefore highly experimental and should be considered an early prototype. It will take some getting used to but we know you'll love it once you see how powerful it is. The best way to get started is to read the "Extending LiveCode" guide which can be found in the dictionary under the "Guide" tab.

### Warning

It is important to stress that **no aspect of this release should be considered final. Every piece of syntax in LiveCode Builder is subject to change**

## Known issues

- The installer will currently fail if you run it from a network share on Windows. Please copy the installer to a local disk before launching on this platform.
- revBrowser for 32-bit Linux fails to run (causing the dictionary to be blank).

## Platform support

The engine supports a variety of operating systems and versions. This section describes the platforms that we ensure the engine runs on without issue (although in some cases with reduced functionality).

### Windows

The engine supports the following Windows OSes:

- Windows XP SP2 and above
- Windows Server 2003
- Windows Vista SP1 and above (both 32-bit and 64-bit)
- Windows 7 (both 32-bit and 64-bit)
- Windows Server 2008
- Windows 8.x (Desktop)

**Note:** On 64-bit platforms the engine still runs as a 32-bit application through the WoW layer.

## Linux

The linux engine requires the following:

- Supported architectures:

*32-bit or 64-bit Intel/AMD or compatible processor*

32-bit ARMv6 with hardware floating-point (e.g. RaspberryPi)

- Common requirements for GUI functionality:

*GTK/GDK/Glib 2.24 or later*

Pango with Xft support

(optional) *esd* - required for audio output

(optional) *mplayer* - required for media player functionality

(optional) *lcms* - required for color profile support in images

(optional) *gksu* - required for privilege elevation support

- Requirements for 32-bit Intel/AMD:

*glibc 2.3.6 or later*

- Requirements for 64-bit Intel/AMD:

*glibc 2.15 or later*

- Requirements for ARMv6:

*glibc 2.7 or later*

**Note:** The GUI requirements are also required by Firefox and Chrome, so if your Linux distribution runs one of those, it will run the engine.

**Note:** If the optional requirements are not present then the engine will still run but the specified features will be disabled.

**Note:** It may be possible to compile and run LiveCode Community on other architectures but this is not officially supported.

## Mac

*The Mac engine supports:*

- *10.6.x (Snow Leopard) on Intel*
- *10.7.x (Lion) on Intel*
- *10.8.x (Mountain Lion) on Intel*
- *10.9.x (Mavericks) on Intel*

**Note:** The engine runs as a 32-bit application regardless of the capabilities of the underlying processor.

## Setup

### Installation

Each distinct version has its own complete folder – multiple versions will no longer install side-by-side: on Windows (and Linux), each distinct version will gain its own start menu (application menu) entry; on Mac, each distinct version will have its own app bundle.

The default location for the install on the different platforms when installing for 'all users' are:

- Windows: <x86 program files folder>/RunRev/LiveCode 8.0.0-dp-6
- Linux: /opt/runrev/livecode-8.0.0-dp-6
- Mac: /Applications/LiveCode 8.0.0-dp-6.app

The default location for the install on the different platforms when installing for 'this user' are:

- Windows: <user roaming app data folder>/RunRev/Components/LiveCode 8.0.0-dp-6
- Linux: ~/.runrev/components/livecode-8.0.0-dp-6
- Mac: ~/Applications/LiveCode 8.0.0-dp-6.app

**Note:** *If your linux distribution does not have the necessary support for authentication (gksu) then the installer will run without admin privileges so you will have to manually run it from an admin account to install into a privileged location.*

### Uninstallation

On Windows, the installer hooks into the standard Windows uninstall mechanism. This is accessible from the appropriate pane in the control panel.

On Mac, simply drag the app bundle to the Trash.

On Linux, the situation is currently less than ideal:

- open a terminal
- `cd` to the folder containing your LiveCode install. e.g.

```
cd /opt/runrev/livecode-8.0.0-dp-6
```

- execute the `.setup.x86` file. i.e.

```
./setup.x86
```

- follow the on-screen instructions.

## Reporting installer issues

If you find that the installer fails to work for you then please file a bug report in the RQCC or email [support@livecode.com](mailto:support@livecode.com) so we can look into the problem.

In the case of failed install it is vitally important that you include the following information:

- Your platform and operating system version
- The location of your home/user folder
- The type of user account you are using (guest, restricted, admin etc.)
- The installer log file located as follows:
  - **Windows 2000/XP:** <documents and settings folder>/<user>/Local Settings/
  - **Windows Vista/7:** <users folder>/<user>/AppData/Local/RunRev/Logs
  - **Linux:** <home>/runrev/logs
  - **Mac:** <home>/Library/Application Support/Logs/RunRev

## Activation

The licensing system ties your product licenses to a customer account system, meaning that you no longer have to worry about finding a license key after installing a new copy of LiveCode. Instead, you simply have to enter your email address and password that has been registered with our customer account system and your license key will be retrieved automatically.

Alternatively it is possible to activate the product via the use of a specially encrypted license file. These will be available for download from the customer center after logging into your account. This method will allow the product to be installed on machines that do not have access to the internet.

## Multi-user and network install support (4.5.3)

In order to better support institutions needing to both deploy the IDE to many machines and to license them for all users on a given machine, a number of facilities have been added which are accessible by using the command-line.

**Note:** *These features are intended for use by IT administrators for the purposes of deploying LiveCode in multi-user situations. They are not supported for general use.*

## Command-line installation

It is possible to invoke the installer from the command-line on both Mac and Windows. When invoked in this fashion, no GUI will be displayed, configuration being supplied by arguments passed to the installer.

On both platforms, the command is of the following form:

```
<exe> install noui options
```

Here *options* is optional and consists of one or more of the following:

-allusers	Install the IDE for all users. If not specified, the install will be done for the current user only.
-desktopshortcut	Place a shortcut on the Desktop (Windows-only)
-startmenu	Place shortcuts in the Start Menu (Windows-only)
-location <i>location</i>	The location to install into. If not specified, the location defaults to those described in the <i>Layout</i> section above.
-log <i>logfile</i>	A file to place a log of all actions in. If not specified, no log is generated.

Note that the command-line variant of the installer does not do any authentication. Thus, if you wish to install to an admin-only location you will need to be running as administrator before executing the command.

As the installer is actually a GUI application, it needs to be run slightly differently from other command-line programs.

In what follows <installerexe> should be replaced with the path of the installer executable or app (inside the DMG) that has been downloaded.

On Windows, you need to do:

```
start /wait <installerexe> install noui options
```

On Mac, you need to do:

```
"<installerexe>/Contents/MacOS/installer" install noui options
```

On both platforms, the result of the installation will be written to the console.

## Command-line activation

In a similar vein to installation, it is possible to activate an installation of LiveCode for all-users of that machine by using the command-line. When invoked in this fashion, no GUI will be displayed, activation being controlled by any arguments passed.

On both platforms, the command is of the form:

```
<exe> activate -file license -passphrase phrase
```

This command will load the manual activation file from *license*, decrypt it using the given *passphrase* and

then install a license file for all users of the computer. Manual activation files can be downloaded from the 'My Products' section of the LiveCode customer accounts area.

This action can be undone using the following command:

```
<exe> deactivate
```

Again, as the LiveCode executable is actually a GUI application it needs to be run slightly differently from other command-line programs.

In what follows <livecodeexe> should be replaced with the path to the installed LiveCode executable or app that has been previously installed.

On Windows, you need to do:

```
start /wait <livecodeexe> activate -file license -passphrase phrase
```

```
start /wait <livecodeexe> deactivate
```

On Mac, you need to do:

```
"<livecodeexe>/Contents/MacOS/LiveCode" activate -file license -passphrase phrase
```

```
"<livecodeexe>/Contents/MacOS/LiveCode" deactivate
```

On both platforms, the result of the activation will be written to the console.



## Engine changes

### Add beta testing entitlement to iOS apps standalone settings (8.0.0-dp-6)

From LiveCode 6.7.8 RC 1 and LiveCode 7.1.1 RC 1, a checkbox allows users to add a beta testing entitlement to their iOS applications.

### LCB: Canvas effect opacity property has no effect. (8.0.0-dp-6)

Removed unused "opacity" property - opacity can be set by specifying a color with alpha less than 1.

### LCB-Canvas: LiveCode crashes when the spread property of an effect in LCB is set to a number greater than 1. (8.0.0-dp-6)

The value passed through to the backend graphics library is now clamped to the range 0..1

### Some arrays encoded in 6.7 format from 7.0 won't load into 6.7. (8.0.0-dp-6)

It was possible for an array in 7.0 to have a key that contained the empty array. When encoded in 6.7 format using `arrayEncode`, the resulting data would not decode correctly in 6.7 - producing a truncated result.

This has been fixed - 6.7 will now successfully load such arrays when generated from 7.0.

### LiveCode Builder Host Library (8.0.0-dp-5)

#### Simplified Canvas Effect Constructor

You can now create a new canvas effect object without setting up an array of properties. Default values will be assumed for unspecified properties:

- size: 5
- spread: 0
- distance: 5
- angle: 60

Example:

```
variable tEffect as Effect
put outer shadow effect into tEffect
```

### Ability to set the dontUseQT property for a player object (Windows and OSX) (8.0.0-dp-5)

It is now possible to set the `dontUseQT` property for a player object. On Windows, the default value of the `dontUseQt` (global) property is false. This means that any player object created will use the QuickTime API for multimedia playback. With this new feature, you can set the `dontUseQT` property of a player to true, without changing the value of the global `dontUseQt` property. In that way you can have both QuickTime and non-QuickTime players playing at the same time.

On OSX, the default value of the `dontUseQT` (global) property is true if the OSX version is greater or equal to 10.8. This means that any player object created will use the AVFoundation API for multimedia playback. With this new feature, you can set the `dontUseQT` property of a player to false, without changing the value of the global `dontUseQt` property. In that way you can have both QuickTime and AVFoundation players playing at the same time. This can be particularly useful for supporting some media formats or codecs that are not supported by the default AVFoundation player (for example .midi files, Sorenson Video 3, H.261 codecs etc)

New "mirrored" property for the OSX player. Applies to both QTKit and AVFoundation player. (8.0.0-dp-5)

The default value of this property is "false". Setting this property to "true" makes the video frames to be displayed mirrored.

Syntax: set the mirrored of player "myPlayer" to true

New 'readyForDisplay' ios player property (8.0.0-dp-5)

We added a new readyForDisplay property to the ios player. This maps to the native readyForDisplay property, and is read-only. For more details see the dictionary entry of mobileControlGet function.

Script Only Stack Property (8.0.0-dp-5)

There is a new boolean stack property **scriptOnly** which specifies whether the stack should be saved as script only. A script only stack does not retain any objects or custom properties.

Xcode 7.0 (8.0.0-dp-5)

iOS 9.0 SDK is now part of the valid SDKs that can be used for iOS standalone application deployment, from Mac OSX 10.10.4.

If you installed the new version of Xcode at another location than the previous one, we invite you to update the Xcode in Preferences > Mobile Preferences.

All the previously existing versions of iOS supported are still supported.

LCS-Widget: Add 'popup widget' command (8.0.0-dp-5)

Syntax: popup widget <kind> [ at <location> ] [ with properties <propertyArray> ]

Summary: Opens a widget within a popup window.

Example:

```
local tProps
// Set the size of the popup
put "0,0,120,50" into tProps["rect"]
// Set the initial color value
put "1,1,0.5" into tProps["initialColor"]

// Show the widget in a popup window
popup widget "com.example.mycolorpicker" at the mouseLoc with properties tProps
```

revCapture - revCaptureListVideoCodecs() results in crash (8.0.0-dp-5)

To palliate this problem, some getters in the library revCapture must return possibly UTF-8 encoded names (such as the codecs) to allow the script writer to set them.

In the same idea, some setters can be given UTF-8 encoded strings.

Affected getters:

- revCaptureListAudioInputs
- revCaptureListVideoInputs
- revCaptureGetAudioInput
- revCaptureGetVideoInput
- revCaptureGetPreviewImage
- revCaptureListAudioCodecs
- revCaptureListVideoCodecs
- revCaptureGetAudioCodec

- revCaptureGetVideoCodec
- revCaptureGetRecordOutput

Affected setters:

- revCaptureSetAudioInput
- revCaptureSetVideoInput
- revCaptureSetPreviewImage
- revCaptureSetAudioCodec
- revCaptureSetVideoCodec
- revCaptureSetRecordOutput

## Support for the web platform using HTML5 (8.0.0-dp-6 - experimental)

The LiveCode engine will now run in web browsers that support HTML5. This means that you can now deploy simple LiveCode apps to users without any installation required.

To deploy a stack as an HTML5 application, enable the "Build for HTML5" checkbox on the "HTML5" page of the standalone settings window, and then generate the standalone in the normal way.

For more information on HTML5 deployment, including options for embedding LiveCode standalones in web pages, please see the "HTML5 Deployment" guide in the IDE dictionary.

**Important: This feature is currently experimental. This means that it may not be complete, or may fail in some circumstances that you would expect it to work. Please do not be afraid to try it out as we need feedback to develop it further.**

## Image metadata (8.0.0-dp-3)

A new read only image property has been added to access the metadata in the image file. The returned array is in the same format as that used for the export command. If no metadata is found then the property returns empty rather than an array with empty elements. Currently the only metadata key that is implemented is density which can be used to determine pixel density in pixels per inch. Metadata is currently only parsed from JPEG and PNG file formats.

For example:

```
put the metadata of image 1 into metadataArray
```

```
set the width of image 1 to the width of image 1 div (metadataArray["density"] / 72)
```

```
set the height of image 1 to the height of image 1 div (metadataArray["density"] / 72)
```

## LiveCode Builder (8.0.0-dp-3)

### LiveCode Builder Language

LiveCode Builder is a variant of the current LiveCode scripting language (LiveCode Script) which has been designed for 'systems' building. It is statically compiled with optional static typing and direct foreign code interconnect (allowing easy access to APIs written in other languages). The compiled bytecode can then be packaged together with any required resources (icons, documentation, images, etc) into a .lce extension package.

Unlike most languages, LiveCode Builder (LCB) has been designed around the idea of extensible syntax. Indeed, the core language is very small - comprising declarations and control structures - with the majority of the language syntax and functionality being defined in modules.

**Note:** It is an eventual aim that control structures will also be extensible, however this is not the case in the current incarnation).

The syntax will be familiar to anyone who has coded with LiveCode Script, however LiveCode Builder is a great deal more strict - the reason being it is intended that it will eventually be compilable to machine code

with the performance and efficiency you'd expect from any 'traditional' programming language. Indeed, over time we hope to move the majority of implementation of the whole LiveCode system over to being written in LiveCode Builder.

**Note:** One of the principal differences is that type conversion is strict - there is no automatic conversion between different types such as between number and string. Such conversion must be explicitly specified using syntax (currently this is done using syntax like *... parsed as number* and *... formatted as string*).

## Extensions

There are two types of extensions which can be written in LCB: widgets and libraries. All installed extensions appear in the new Extension Manager stack, which can be opened from the Tools menu.

An LCB library is a new way of adding functions to the LiveCode message path. Public handlers in loaded LCB libraries are available to call from LiveCode Script.

A widget is a new type of custom control which, once compiled and packaged, can be loaded into the IDE. Using the widget is no different from any of the classic LiveCode controls you've been used to. Simply drag it onto a stack and start interacting with it as you would any another control.

You can reference the widget in script as a control:

```
set the name of the last control to "clock"
```

Or more specifically as a widget:

```
set the tooltip of widget 1 to "This is my nice new clock widget"
```

## Getting Started

To get started with LiveCode Builder, click on the "Dictionary" icon in the IDE toolbar, select the "Guide" tab and then "Extending LiveCode" from the drop-down menu. This will show you the user-guide on getting started with writing widgets and libraries in LCB. Alternatively, you can start by looking at some of the extensions shipped with LiveCode 8 - the source and other resources for these are located in the "extensions" sub-folder of your LiveCode installation directory (source files are named

## Packaged extensions naming consistency (8.0.0-dp-3)

Earlier versions of the widgets and libraries which are bundled with the IDE were named inconsistently.

Now all LiveCode extensions are named either `com.livecode.widget.<widget name>` or `com.livecode.library.<library name>`.

*Note:* This change will break some stacks that have widgets saved on them, or scripts which refer to a widget by its kind.

## Feature: Popup Widgets (8.0.0-dp-3)

Added the ability to use widgets within popup dialog windows.

### New Syntax:

- `popup widget <Kind> at <Position> [ with properties <Properties> ]`
- Launch the named widget as a popup. The popup can return a value in the result.
- currently popped up
- test if this widget is part of a popup
- `close popup [ returning <Result> ]`
- set the result of the calling popup statement to `<Result>`

## Various bugs with navigation bar widget (8.0.0-dp-3)

- Selecting "names" as the itemStyle does not work
- Changing the navIcons via script / property inspector does not work
- The navSelectedIcons property is missing.
- editMode should default to false
- add 'navigate' message to widget docs

## Specific bug fixes (8.0.0-dp-6)

*(bug fixes specific to the current build are highlighted in bold, reverted bug fixes are stricken through)*

- 16032 catch OnMouseCancel in gradientrampeditor**
- 15981 Remove OnMouseStillDown from docs**
- 15966 LCB: Canvas effect opacity property has no effect.**
- 15948 Array intersect is completely wrong in LC 7**
- 15916 LCB-Canvas: LiveCode crashes when the spread property of an effect in LCB is set to a number greater than 1.**
- 15799 Some arrays encoded in 6.7 format from 7.0 won't load into 6.7.**
- 15245 Only the first character of a line prints on Linux.**
- 15197 OnVisibilityChanged not sent to widgets**
- 14706 Request to add beta testing entitlement to iOS apps**

## Specific bug fixes (8.0.0-dp-5)

- 15934 Holding down the SHIFT key while pressing the Backspace key does nothing
- 15908 LCB: calling libffi closures causes Android crash
- 15897 LiveCode crashes when trying to clone a group containing a widget object whose kind is not installed
- 15895 Using put with only the first half of a surrogate pair in the message box locks up IDE
- 15870 HTML5: embedded images are colour-swapped
- 15868 HTML5: 'the mouseLoc' always returns 0
- 15866 line breaks do not survive parsing by documentation reader
- 15848 Crash on repeating revXMLMatchingNode twice on the same tree
- 15846 MCWidgetEvalsPointWithinRect(pPoint
- 15845 Solid Paint With Color API entry incorrect
- 15844 mobilePickDate "time"
- 15836 Widgets: OnOpen / OnClosed messages sent when widget is relayered.
- 15822 watchedvariables and breakpoints property parsing too strict
- 15816 MobilePick does not display Cancel Done if index is filled in
- 15814 Can't read a file using UNC path in Windows
- 15808 Widgets: SVG Icon widget not documented
- 15805 Docs: Second Syntax element overwrites first
- 15798 Array property references in variables not resolved properly
- 15763 Can't select the last control by chunk expression
- 15750 Documentation updated for URL("file:") and Unicode files
- 15649 cursor property not reset to empty at cursor unlocking in LiveCode 7
- 15606 systemVersion reports incorrect value from Windows 8.1
- 15345 Rendering issues
- 15273 setting imagesource in tabbed field hides text and gives wrong width
- 15208 LiveCode crashes when using System Character Viewer
- 15129 LCS-Widget: Add 'popup widget' command
- 14970 Dictionary: Tables not correctly specified in htmltext entry  
tan entry in API dictionary contains typographical error. function end on line 40 was

- 14837 `cosInDegrees` instead of `tanInDegrees`
- 14447 `[[Docs]] QTVersion` of `QuickTime` return 0.0
- 14423 `revCapture - revCaptureListVideoCodecs()` results in crash
- 13820 `Player` object cannot play a midi file on Yosemite.
- 13754 Changing the `scalefactor` might hide the stack off screen
- 13694 Impose a limit of 1024 form fields in an HTTP POST request.
- 9942 The "system time" is always returned in long format on Linux
- 9744 iOS video playback starts with black frames
- 1751 command "flip the selobj vertical" returns errors

#### Specific bug fixes (8.0.0-dp-4)

- 15752 Large variable cause the IDE to hang

#### Specific bug fixes (8.0.0-dp-3)

- 15681 Occasional issue parsing SVG data in LCB
- 15630 get property `tVar` of my script object not working in develop branch
- 15620 Check if `m_rep` is nil in `MCIImage::GetMetadataProperty`
- 15618 `Codeunit` and delimited chunk offsets probably broken in 8.0
- 15605 Property inspector does not update when graphics are being created using tools
- 15509 Condition " in " does not throw parse error for 'case' or 'repeat until/while'
- 15405 LCS: Can't create a widget in a group
- 15378 `BackColor` doesn't work properly for graphic on closed stack
- 15358 LC 8 has a very noisy startup
- 15286 Palette Actions: Nav items need tooltips
- 15224 Various bugs with navigation bar widget
- 15214 IDE-Widgets: Icon picker does odd things when resized
- 15156 Putting value into item of empty variable hangs LiveCode
- 15056 Read from file for (x | x chars | x bytes) returns empty
- 14996 LCB-Canvas: polyline path
- 14961 Gradient - Quality set to "good" makes LC crash
- 14806 LCB-Canvas: curve through examples are incorrect in docs

#### Specific bug fixes (8.0.0-dp-1)

- 14851 Popup won't stop displaying when displayed in `MouseDown` of button widget
- 14602 `URLEncode` crashes LiveCode
- 14599 LCB: Text sort is inconsistent with string comparison
- 14538 `bool` formatted as string does not work

## IDE changes

#### Widget default scripts (8.0.0-dp-6)

When opening the code editor for a widget, it will now be prepopulated by the script specified in the widget's `defaultScript` metadata.

#### Variable viewer resizable columns (8.0.0-dp-6)

The variable viewer's tree view widget display now has its `showSeparator` property set

to true, which allows the user to resize the columns of its display.

### Add svgicon editor which uses widget and pops up icon picker (8.0.0-dp-6)

A new editor has been added to the property inspector -

`com.livecode.pi.svgicon`

This editor allows the selection of an icon from the icon picker, with the property using the editor being set to the name of the icon picked.

### Point editor (8.0.0-dp-5)

A point editor (`com.livecode.pi.point`) has been added to manipulate appropriate properties in the property inspector (eg hotspot, loc)

### Menu bar (8.0.0-dp-3)

The menubar has been made a script-only stack to facilitate bugfixes and community contributions. Users should not notice much difference in terms of its appearance. Some of the menu items have been changed, however:

The 'New Mainstack' item now has a submenu with a range of size choices, as well as the option to create a script-only stack. Selecting script-only stack will prompt a choice of name, and subsequently open the stack in the script editor.

We have centralised the building and handling of contextual menus in the menubar script, thereby making per-object contextual menus display and behave consistently throughout the IDE.

The Object > New Control submenu is now generated based on the property information present for each object type, and the newly added Object > New Widget submenu is generated based on the currently loaded widget extensions.

### Property Inspector

A number of changes have been made to property editors in the property inspector:

- The color editors now use a color swatch widget to display the chosen color
- Numeric editors have a slider if the property has an associated min/max, and an increment/decrement twiddle if it has a step value.
- The navbar widget now uses a version of itself as an editor for its properties (`com.livecode.pi.navbar`)
- A graphic effects property editor has been added (`com.livecode.pi.graphiceffect`)
- A gradient property editor has been added (`com.livecode.pi.gradientramp`)
- A script property editor has been added, which contains a button to edit the selected script (`com.livecode.pi.script`)
- A time zone property editor has been added, which contains a drop-down list of time zones (`com.livecode.pi.timezone`)

### Widget metadata and the IDE

Widget metadata now controls a number of additional features with respect to how the widget interacts with the IDE.

Firstly, the `preferredSize` attribute controls the initial size of the widget when dragged out from the tools palette.

For example, the navbar widget now has

```
metadata preferredSize is "320,49"
```

so that when dragged out, it is created at the correct size for an original iPhone screen.

Secondly, the `userVisible` attribute controls whether the widget appears at all in the tools palette of the IDE.

A number of widgets have been declared user invisible for this release, either because they are not meant to be draggable objects at all (eg the icon picker widget, which is designed to be popped up) or are not quite refined to the point where they are suitable for user stacks, but are included because they are being used in the IDE (for example the tree view widget).

Finally if present, the `svgicon` attribute will be used to display an icon for the widget in the tools palette, taking precedence over the included icon resources. All of the widgets included by default in the tools palette now use `svg` icon paths.

## Standalone Settings

A field has been added to the Copy Files tab of the standalone settings which is populated with the list of currently installed extensions. All selected extensions from this list are included in standalones and loaded when the standalone is launched. 'Use' dependencies are automatically calculated and included along with the top-level widget.

## Property Inspector (8.0.0-dp-3)

The property inspector has been rewritten to allow properties of widgets to be inspected and edited. It has been implemented with flexibility and extensibility in mind, since it must be able to control the values of widget properties in any way required by the widget developer. Each property now has a number of attributes which affect how it appears in the inspector.

### Property Attributes

The following is the list of property attributes:

#### **default**

The default value of the property. If there is no default value (for example the 'loc' property does not have one), the string "no\_default" can be used. The property inspector pops up a contextual menu when editors are right-clicked allowing the user to set the property back to a default value.

#### **editor**

The editor that will be used to display the value of the property and allow it to be edited. See the dedicated section below for details on property inspector editors.

#### **group**

Properties are grouped by themselves in the inspector by default. If a particular group name is specified for a set of properties, their editors are placed next to each other in the inspector.

#### **label**

The label to use for this property.

#### **options**

For properties whose value is a choice from a set of options, that set should be specified as a comma delimited list for the options attribute. Default editors are provided for 'enum' type properties (choice of exactly one from a set) and 'set' type properties (choice of zero or more from a set).



Lists of options can be generated using LiveCode Script for the inspector at run-time, by using the 'execute' syntax - for example the options for the textFont property are generated using

```
execute: get the fontNames; sort it
```

Whatever remains in the 'it' variable after executing the specified script is used as the list of options.

### **section**

The section attribute controls which tab of the property inspector contains the property in question. Currently this is required to be one of the following

- Basic
- Data Grid
- Custom
- Table
- Colors
- Effects
- Icons
- Position
- Text

But in the future it may be possible to specify custom sections.

### **user\_visible**

Properties are visible in the property inspector by default. Set the user\_visible attribute to false to hide a given property from the user.

### **read\_only**

Read only properties will be displayed in the property inspector but the corresponding editor will have its "editorEnabled" property set to false. See the Editors section below for more details on enabled/disabled editors.

### Widget Properties

Widget metadata is used to control the display of widget properties in the inspector. Items of metadata which determine property attributes are of the form:

```
metadata <property>.<attribute> is "<value>"
```

These are stored as property data for the widget at load time. The <attribute> can be any of those specified in the Property Attributes section above. If the attributes are not specified, their values are as follows:

- default - "no\_default"
- editor - "com.livecode.pi.number" for Integer/Real properties, "com.livecode.pi.<type>" for properties of type <type>.
- group - the name of the property
- label - the name of the property
- options - empty
- section - "Basic"
- user\_visible - true
- read\_only - true if there is no specified 'set' handler or variable for the property, false otherwise.

### Script Object Properties

Script-level properties of objects (including widgets) are specified in files in the Toolset/resources/supporting\_files/property\_definitions folder. The propertyInfo.txt file specifies the default values for all the property attributes. Each object type then has a specification of which properties should be displayed in the inspector when it is the selected object, and any options/default/group values which override the defaults.

## Editors

Currently an editor must be a stack consisting of a group named "template" and a button named "behavior". The property inspector looks up the specified editor for a given property, clones the template group, and sets its behavior to the long id of the button.

The behavior script must at a minimum implement the following three handlers:

```
on editorInitialize
on editorUpdate
on editorResize
```

There are a number of properties available to any editor:

- editorMinWidth
- editorMaxWidth
- editorEnabled
- editorEffective
- editorValue

These should be set or got appropriately. For example, if an editor consists of a text field, the editorUpdate handler should update the value of the field with 'the editorValue of me'. Similarly, if the content of the field changes, the field should call a function in the behavior which sets 'the editorValue of me' to the content of the field.

The editorEnabled and editorEffective properties are set by the generic behavior depending on the property info and the values of the properties. The editorEffective is true if the value of the property in question is empty but there is an effective value in play. The editor should alter the display of its value accordingly.

Editors can specify their min and max width if required.

The following editors are built-in, and available to use for widget properties with common types:

- com.livecode.pi.array - a Tree View widget
- com.livecode.pi.boolean - a check box
- com.livecode.pi.color - a color swatch and dialog
- com.livecode.pi.colorwithalpha - a color swatch and dialog, and alpha value slider
- com.livecode.pi.enum - an option menu
- com.livecode.pi.file - a file selector
- com.livecode.pi.number - a single-line field with increment/decrement twiddle
- com.livecode.pi.pattern - a pattern selector
- com.livecode.pi.set - a field with multi-select list behavior
- com.livecode.pi.string - a single-line field
- com.livecode.pi.text - a multi-line field

There are also some bespoke editors for particular object properties:

- com.livecode.pi.customprops
- com.livecode.pi.datagrid
- com.livecode.pi.textalign
- com.livecode.pi.textstyle

It is our intention that ultimately a widget alone will be able to function as a property editor, however currently this feature is not available.

## IDE stackfiles named with version. (8.0.0-dp-1)

When a binary stackfile is rewritten in the IDE for a new version, it should have a (major) version in the filename to prevent unwanted IDE merging between versions. This can also be used to ensure incompatible stacks are not loaded if present - the IDE will only load stacks with a version less than or equal to its version.

For example, from 8.0 onwards, revTools has filename /Toolset/revTools.8.rev.

## Specific bug fixes (8.0.0-dp-6)

*(bug fixes specific to the current build are highlighted in bold, reverted bug fixes are stricken through)*

- 16028 Plugins don't all show in plugin settings menu**
- 16025 Datagrid invisible while dragging out**
- 16023 revPreferences already in memory when prefs are loaded**
- 16013 Dragging controls is extremely slow/jerky**
- 16011 Error in the PI when setting a color property to a named color**
- 16010 PI Stacks not considered IDE stacks from POV of debugger**
- 16000 Tools palette is reloaded after being replaced by plugin**
- 15998 Datagrid PI**
- 15985 IDE Property Inspector tabs not in sync with current pane**
- 15975 In IDE field appears to have the focus but does not respond to key presses**
- 15972 Error when opening inspector for multiple objects**
- 15962 IDE Window menu is not refreshed**
- 15961 When button style is opaque**
- 15947 PI: Number editor slider doesn't respect step value**
- 15859 Add svgicon editor which uses widget and pops up icon picker**
- 15825 Dictionary: Content not rendered well when stack is too thin**
- 15792 Extension Builder : have to dismiss twice**
- 15788 Dictionary: Improve search**
- 15784 user plugins not loaded**

## Specific bug fixes (8.0.0-dp-5)

- 15926 Add ability in the script editor variables pane to filter list of variables and show/hide global/environment variables
- 15893 Message box emptied when closing and opening
- 15882 Suppress messages in IDE can't be turned off
- 15854 Stop Editing Group menu item doesn't work in LC8
- 15847 Datagrid PI needs min width
- 15843 Right click context menu stops working after Send Message from Card context menu
- 15842 Lock Location group property cannot be set or disabled from context menu
- 15841 GUI preferences not changing sort order of objects in project browser
- 15838 Changing size of dictionary headers crashes LiveCode
- 15832 Single-line message box doesn't like ','
- 15827 Default iPhone 6 Plus screen should be 414 X 736
- 15824 Dictionary: Script error
- 15801 The tool palette was empty (except for the run/design choices)
- 15794 Tab panel icon in the tools palette is cropped
- 15791 typo in dialog title on opening an extension file
- 15770 Can't place group on card from menubar
- 15769 Add new card option to stack contextual menu
- 15759 Autocomplete does not recognise property names and sentences starting with "the"

- 15757 Message box does not allow editing of msg variable
- 15755 Building a standalone with "Answer Dialog" checked in standalone settings causes error at launch
- 15745 PI can open up (close to) off screen
- 15744 mainStack menu in PI only lists open stacks
- 14465 Rulers don't stay fixed to the stack when moving the stack
- 14224 Combo box will not allow typing into an "Ask" dialog.
- 13709 some message box output in LC when aligning text using menu Text->Align->...
- 13646 graphic bug in standalone application settings window
- 11872 impossible to change the case from all caps etc
- 3962 Delete key completely clear Ask dialog

#### Specific bug fixes (8.0.0-dp-4)

- 15803 Open file doesn't recognise .mc as valid livecode stack extension
- 15796 Selecting a checkbox adds a border
- 15795 Progress bar icon missing from tools palette
- 15793 Tools palette has incorrect title
- 15787 "widget builder in plugins" is actually "extension builder" under "Tools"
- 15786 Datagrid PI script error
- 15776 Tools should be ordered as they are in previous releases
- 15739 Inconsistent letter case in the my\_livecode folder

#### Specific bug fixes (8.0.0-dp-3)

- 15601 traversalOn property missing from widget property inspector
- 15600 Array and enum return values not displayed correctly in dictionary
- 15542 Typo in stack property inspector in LC 8.0
- 15464 Browse tool selected when launching LC8
- 15430 PI doesn't show foregroundColor for legacy graphic control
- 15427 Cut
- 15323 Style property should be an enum
- 15293 Behavior property inspector control should have way to edit behavior script or open stack/card that has behavior
- 15285 IDE: Property inspector string value should change property when clicking outside the field.
- 15247 Default Field name should be "Field"
- 15235 Simulators not listed in Development > Test Target menu
- 15227 card 'Single Line' Message Box script doesn't pass openCard and resizestack
- 15220 Widgets Tab of extension manager is empty when reopening
- 15216 IDE: Infinite loop when resolving load order
- 15180 Can't put values of debug variables from the message box
- 15001 Extension Builder: need to set the hideConsoleWindows to true before executing shell commands
- 14971 Debugger Break Point not met on right click "Send Card/Stack message"
- 14890 Control icons missing from tools palette
- 14873 Close and remove from memory does nothing from File menu
- 14852 PI color editor doesn't react well to colors with alpha value
- 14831 Open script-only stacks in script editor when they are opened
- 14822 Edited status of stack not being set
- 14738 Inspect menu missing from property inspector
- 14561 Widgets are not ordered in the tools palette or extension manager

### Specific bug fixes (8.0.0-dp-1)

- 14627
- 13475 in the openstack handler dispatching a mouseUp to a btn does not work correctly
- 13447 Project Browser control layer display
- 13417 IDE systemVersion comparison no longer works with Yosemite
- 13398 Sample - Book Library.livecode edit and delete features broken
- 13362 Script editor opens revmenubar script when no other stack is open
- 13343 Cannot install Android standalone on some devices
- 13215 Can't type in output field of message box
- 13191 FIX: flip graphic horizontally and vertically for complex graphics
- 13159 Palettes not observing decorations under certain circumstances
- 12880 File->Exit should be File->Quit
- 11755 flip graphic gives erroneous results with complex graphics

## LiveCode Builder changes

### LiveCode Builder Tools

#### lc-compile

#### Warnings

- A new warning has been added for identifiers that may conflict with syntax keywords.
- metadata definitions that occur before module imports no longer

trigger a warning.

#### Command-line interface

- A new `--verbose` command line flag has been added. If it is specified, **lc-compile** will output additional debugging information.

#### Manifest

- A module now outputs its type to the manifest XML.

Compiler generates an error if integer literal too big

The compiler will generate an error if an integer literal is too big to fit into the (current) unsigned 32-bit integer representation.

### LiveCode Builder Language

#### Core types

- The following deprecated core type names have been removed:
  - `boolean` (replaced by `Boolean`)
  - `integer` (replaced by `Integer`)
  - `real` (replaced by `Real`)
  - `number` (replaced by `Number`)
  - `string` (replaced by `String`)
  - `data` (replaced by `Data`)
  - `array` (replaced by `Array`)
  - `list` (replaced by `List`)

#### Sort using arbitrary comparison handler

The ability to sort a list using an arbitrary comparison handler has been added. The syntax is

```
sort <List> using handler <Handler>
```

A public handler type `SortCompare` has been added to the sort module.

The handler used for sort comparison must be of type `SortCompare`, i.e. be of the form

```
MyComparisonHandler(in pLeft as any, in pRight as any) returns Integer
```

#### Identifiers

- Identifiers are now expected to match `[A-Z0-9_.`].

## Syntax

- Syntax keywords are no longer permitted to match [A-Z0-9\_].
- metadata definitions may now occur anywhere a module's top-level

context.

- use declarations may now occur anywhere in a module's top-level

context.

Change to handler return type syntax.

- The syntax for declaring the return type for a handler, or handler type has been changed to [ 'returns' 'nothing' | 'returns' <Type> ].

## Case-Sensitivity

- All identifiers are now case-insensitive - i.e. a handler Main can be called as mAin, MAIN and main.

Replace concept of 'undefined' with 'nothing'

- The use of the keyword 'undefined' is now deprecated, 'nothing' should be used instead.
  - Use 'returns nothing' to indicate a handler which returns no value.
  - Use 'nothing' to indicate no value when manipulating optionally type variables
- The 'is defined', 'is undefined', 'is not defined', 'is not undefined' syntax is now deprecated, 'is' and 'is not' should be used with 'nothing' instead
  - Use <expr> is nothing and <expr> is not nothing to test whether an expression has a value or not
  - The phrase <left> is <right> will now return true if <left> and <right> are both nothing
  - The phrase <left> is not <right> will now return true if one of <left> or <right> are nothing (but not both).

Foreign handler definitions require explicit typing.

- A foreign handler definition must declare an explicit return type.
- Each parameter in a foreign handler definition must declare an explicit type.

## Foreign Handler Types

It is now possible declare foreign handler types:

```
foreign handler type MyCallback(in pContext as optional pointer, in pValue as any) as CBool
```

When used in the context of a foreign handler definition, a foreign handler type will cause automatic bridging of the LCB handler to a C function pointer which can be called directly by the native code.

The function pointers created in this fashion have lifetime equivalent to that of the calling context. In particular, for widgets they will last as long as the widget does, for all other module types they will last as long as the module is loaded.

## IntSize Type

- There is now an IntSize foreign type, mapping ssize\_t.

## LiveCode Builder Host Library

### Determining if a widget is enabled

- It is now possible to determine the enabled state of a widget from within its script.
  - The my enabled property returns true if the widget is currently enabled
  - The my disabled property returns true if the widget is currently disabled
  - If script changes the enabled (or disabled) property of the widget then an OnParentPropChanged message will be sent.

### Ability to display a popup menu

- New syntax has been added to popup a menu constructed from a provided menu text.
  - popup menu <MenuText> at <Point>

### Ability to access a widget's effective font

- The textFont, textSize and textStyle properties have been reserved to the host.
- New syntax my font has been added which returns a Canvas.Font matching the current effective values of the text properties that have been set on the widget.

### Detecting successive clicks

- The OnClick event is sent every time a mouseDown/mouseUp sequence is detected by the engine on a widget.
- Use 'the click count' syntax to fetch the number of successive clicks which happened close together and within a certain time of each other.

### Widget Printing

- Widgets now print along with other controls.
  - Widgets will be rasterized at screen resolution and then printed as an image.
  - Higher-fidelity printing of widgets will be implemented at a later date.

### Composed widgets

The ability to compose widget objects has been added. Widgets can either be 'host' widgets, created when a widget is directly embedded in a stack, or 'child' widgets which are created when a widget is used as a child widget within another widget.

#### Syntax

A Widget type has been added, so that variables can contain references to child widget objects. A variable to hold a widget reference can be defined in the usual way, e.g.

```
variable tWidget as Widget
```

New widget syntax has been added to create, place, unplace and manipulate child widgets.

- a new widget <kind> - Creates a widget object of the specified kind.
- place <widget> [at (bottom|top) | (below|above) <other widget>] - Adds a child widget to the parent on the specified layer.
- unplace <widget> - Removes a child widget from the parent.
- the target - Returns the child widget that started the current execution.
- my children - Returns a list of the currently placed child widgets of this widget.



- property <property> of <widget> - Enables manipulation of a property implemented by a child widget.
- the rectangle of <widget> - Enables manipulation of the rectangle property of a child widget.
- the width of <widget> - Enables manipulation of the width property of a child widget.
- the height of <widget> - Enables manipulation of the height property of a child widget.
- the location of <widget> - Enables manipulation of the location property of a child widget.
- the enabled of <widget> - Enables manipulation of the enabled property of a child widget.
- the disabled of <widget> - Enables manipulation of the disabled property of a child widget.
- annotation <name> of <widget> - Enables tagging of child widgets with named values.

## Events

Events triggered on child widgets (such as OnMouseUp) are automatically passed up to the parent, as long as the child's event handler returns nothing. If any event handler returns something, the event is considered handled and is not passed to the parent.

## Messages

Messages posted by the child widget can be handled by the parent in an On<message name> handler. For example, if the child has the code

```
post "dataChanged" with [mdataArray],
```

this can be handled in the parent by adding

```
public handler OnDataChanged(in pArray as Array).
```

Posted messages can only be handled by a direct parent, and a widget's script object will only receive messages posted by host widget, i.e. the topmost parent.

## Example

See

<https://github.com/livecode/livecode/blob/develop/extensions/widgets/simplecomposed/simplecomposed.lcb> for an example of how the host/child relationship can be used.

## Native Code Access

LiveCode extensions can now contain native code libraries which LCB will use to resolve foreign handler references.

The foreign handler binding string should be of the form libname>function to use this feature. In this case, the engine will look for a library libname on a per-platform basis when the foreign handler needs to be resolved.

Native code libraries should be present inside the resources folder inside the extension archive. The engine derives the appropriate path from the requested library name and current platform. The structure is as follows:

```
<extension>/
  resources/
    code/
      mac/
        <library>.dylib
      linux-x86/
        <library>.so
```

```

linux-x86_64/
    <library>.so
win-x86/
    <library>.dll

```

*Note:* At present, only the desktop platforms are supported.

*Note:* The above structure is likely to change in a future release. In particular the code folder will sit at the same level as resources rather than within it.

## LiveCode Builder Standard Library

### Mathematical functions

- Several mathematical functions now throw "domain errors" when applied to values that the function is not defined for, including

log10(), ln(), asin() and acos(), and  $x ^ y$ .

### Foreign function interface

- The following deprecated foreign type names have been removed from the com.livecode.foreign module:
  - pointer (replaced by Pointer)
  - bool (replaced by CBool)
  - uint (replaced by UInt32 or UInt)
  - int (replaced by Int32 or CInt)
  - float (replaced by Float32 or CFloat)
  - double (replaced by Float64 or CDouble)
  - NativeCString (replaced by ZStringNative)

### Sequence operations

- New syntax has been added for searching partial contents of sequence types (List, String and Data) based on the offset operation.
  - the offset of <Needle> before <Position> in <Haystack>
  - the offset of <Needle> after <Position> in <Haystack>
  - Equivalent syntax has been added for the index operation.

## LiveCode Extension changes

### treeview Widget

#### Column View

Two new properties have been added in order to allow the key-value pairs of the tree view to be displayed in separate columns: `showSeparator` and `separatorRatio`.

The `showSeparator` property controls whether the tree view is in columns or not. The

`separatorRatio` property controls where the separator is - more specifically it is the

proportion of the view space that is taken up by the key column.

When the `showSeparator` property is true, the separator can be dragged by the user to resize the columns.

#### Double Click

When a leaf node of the tree is double-clicked, an `actionDoubleClick` message is sent to the widget's script object. It has one parameter: the path associated with the clicked row.

#### Inspect Icon

When in read only mode, the tree widget will now display an 'open in new window' icon if the value of the array at the specified path contains a newline character, or is too large to display in the widget.

If this icon is clicked, an `actionInspect` message is sent to the widget's script object.

It has one parameter: the path associated with the clicked row.

#### Sorting Options

The tree view widget now has the ability to sort the keys of its `arrayData` in different ways.

Two properties have been added to achieve this:

- `sortOrder`: either "ascending" or "descending"
- `sortType`: either "text" or "numeric".

The default sort order of the widget is ascending numeric.

### navbar Widget

#### Widget Theme

The theme of the navigation bar widget can now be set to iOS, Android(Dark) or Android(Light).

The following property has been added:

- `widgetTheme`: either "iOS", "Android(Dark)" or "Android(Light)"

The following property has been modified:

- `opaqueBackground` --> `backgroundOpacity`: either "Opaque", "Translucent" or "Transparent"

The default theme is iOS and the default background is opaque.

### segmented Widget

#### Segment Count

A `segmentCount` property has been added to the segmented control. This controls the number of segments. If it is less than the current number of segments, segments will be deleted from the right. If it is more, segments will be added with default icons (circle), labels ("Title") and names ("segment<n>").

## widget-utils

Utility module added

A module, **com.livecode.widgetutils**, has been written to provide support for functions commonly needed by widgets.

The functions are:

- `constrainPathToRect`: Scales and translates a Path value to fit within a rectangle
- `intToString`: Formats an integer as a string
- `stripZeros`: Removes any superfluous zeros and decimal places from a string representation of a number.
- `colorToString`: Converts a value of type Color to an RGB or RGBA string representing the color
- `stringToColor`: Converts a comma-delimited string representing an RGB or RGBA color to a value of type Color.

See the documentation for more details on the individual handlers and their syntax.

## svgpath Widget

iconPathPreset Editor

The property inspector editor for the `iconPathPreset` property is now an instance of the SVG Icon widget itself, which pops up the Icon Picker widget when clicked.

## colorswatch Widget

Bugs fixed

[15851] error getting `swatchColor` when it is empty

## header Widget

Documentation

The messages posted by the header bar widget have been documented.

Widget Theme

The theme of the header bar widget can now be set to iOS or Android.

The following property has been added:

- `widgetTheme`: either "iOS" or "Android"

The default theme is iOS.

The following properties have also been added, these can only be set if the theme of the widget is "Android":

- `colorScheme`: this can be selected from the list of Android color scheme
- `leftAction`: the icon displayed on the left of the header
- `titleVisibility`: whether the title in the header is displayed or not
- `distinctTitle`: whether the title in the header is distinct or not

The following properties of the widget can only be set if the theme of the widget is "iOS":

- headerSubtitle
- leftLabel
- actionStyle
- showBackIcon
- showSearchIcon
- actionColor
- showDivide

The following properties of the widget can be set regardless of the theme:

- widgetTheme
- headerTitle
- headerActions
- backgroundOpacity

## pushbutton Widget

Push Button Widget Added

Push button widget.

This theme of this widget can either be:

- iOS
- Android(Raised)
- Android(Flat)

The default theme is iOS.

## paletteactions Widget

Bugs fixed

[16009] Palette actions initial menu causes error when popping up

## json

JSON Library Added

An LCB library, **com.livecode.library.json**, has been written to provide support for generating and parsing JavaScript Object Notation (JSON) data. See also <<http://json.org>>.

### Functions

The library has two public handlers, `jsonImport` and `jsonExport`. `jsonImport` takes a string containing JSON-formatted text and parses it into a LiveCode value. `jsonExport` takes a LiveCode value and returns the equivalent value as a string in JSON format.

### Using the library

The library is automatically loaded into the IDE, and the `jsonImport` and `jsonExport` handlers placed in the message path where they are available to call from any object. In LiveCode Script, `jsonExport` takes any value and converts it to a string representing a JSON encoded value.

To use the library from a LiveCode Builder widget or library, simply add it to the list of use clauses:

```
use com.livecode.library.json
```

When using the `jsonExport` handler in LCB, an error is thrown if the value passed

is not of one of the following types:

- String
- Number
- List
- Array
- Boolean
- nothing

### Examples

From LiveCode Script:

```
local tData, tJSON
put "a,b,c,d" into tData
split tData by comma
put JsonExport(tData) into tJSON -- contains {"1": "a","2": "b","3": "c","4": "d"}
```

From LiveCode Builder:

```
variable tJSON as String
put "[1,1,2,3,5,8]" into tJSON
variable tData as List
put JsonImport(tJSON) into tData -- contains [1,1,2,3,5,8]
```

## Dictionary additions

- **create widget** (*command*) has been added to the dictionary.
- **export widget** (*command*) has been added to the dictionary.
- **import widget** (*command*) has been added to the dictionary.
- **load extension** (*command*) has been added to the dictionary.
- **popup** (*command*) has been added to the dictionary.
- **unload extension** (*command*) has been added to the dictionary.
- **loadedExtensions** (*function*) has been added to the dictionary.
- **newWidget** (*message*) has been added to the dictionary.
- **widget** (*object*) has been added to the dictionary.
- **is not really** (*operator*) has been added to the dictionary.
- **is really** (*operator*) has been added to the dictionary.
- **kind** (*property*) has been added to the dictionary.
- **scriptOnly** (*property*) has been added to the dictionary.

## Dictionary changes

- The entry for **accept** (*command*) has been updated.
- The entry for **close socket** (*command*) has been updated.
- The entry for **constant** (*command*) has been updated.
- The entry for **create stack** (*command*) has been updated.
- The entry for **define** (*command*) has been updated.
- The entry for **delete URL** (*command*) has been updated.
- The entry for **do** (*command*) has been updated.
- The entry for **doMenu** (*command*) has been updated.
- The entry for **export with palette** (*command*) has been updated.
- The entry for **get** (*command*) has been updated.
- The entry for **launch url** (*command*) has been updated.
- The entry for **libURLDownloadToFile** (*command*) has been updated.
- The entry for **libURLSetCustomHTTPHeader** (*command*) has been updated.
- The entry for **libURLSetFTPListCommand** (*command*) has been updated.
- The entry for **libURLSetFTPMode** (*command*) has been updated.
- The entry for **libURLSetFTPStopTime** (*command*) has been updated.
- The entry for **libURLSetLogField** (*command*) has been updated.
- The entry for **libURLsetStatusCallback** (*command*) has been updated.
- The entry for **libURLftpUpload** (*command*) has been updated.
- The entry for **libURLftpUploadFile** (*command*) has been updated.
- The entry for **libURLSetAuthCallback** (*command*) has been updated.
- The entry for **libURLSetExpect100** (*command*) has been updated.
- The entry for **libURLSetSSLVerification** (*command*) has been updated.
- The entry for **load** (*command*) has been updated.
- The entry for **mobileAddContact** (*command*) has been updated.
- The entry for **mobileComposeHtmlMail** (*command*) has been updated.
- The entry for **mobileComposeMail** (*command*) has been updated.
- The entry for **mobileComposeUnicodeMail** (*command*) has been updated.
- The entry for **mobileUpdateContact** (*command*) has been updated.
- The entry for **open socket** (*command*) has been updated.
- The entry for **play video** (*command*) has been updated.
- The entry for **print link** (*command*) has been updated.
- The entry for **put cookie** (*command*) has been updated.
- The entry for **read from socket** (*command*) has been updated.
- The entry for **resetAll** (*command*) has been updated.
- The entry for **resolve image** (*command*) has been updated.

- The entry for **revBrowserAddJavaScriptHandler** (*function*) has been updated.
- The entry for **revBrowserNavigate** (*command*) has been updated.
- The entry for **revBrowserSet** (*command*) has been updated.
- The entry for **revCacheGeometry** (*command*) has been updated.
- The entry for **revCloseCursor** (*command*) has been updated.
- The entry for **revCloseDatabase** (*command*) has been updated.
- The entry for **revCloseVideoGrabber** (*command*) has been updated.
- The entry for **revCommitDatabase** (*command*) has been updated.
- The entry for **revExecuteSQL** (*command*) has been updated.
- The entry for **revGoToFramePaused** (*command*) has been updated.
- The entry for **revInitializeVideoGrabber** (*command*) has been updated.
- The entry for **revLoadSpeech** (*command*) has been updated.
- The entry for **revMail** (*command*) has been updated.
- The entry for **revMoveToFirstRecord** (*command*) has been updated.
- The entry for **revMoveToLastRecord** (*command*) has been updated.
- The entry for **revMoveToNextRecord** (*command*) has been updated.
- The entry for **revMoveToPreviousRecord** (*command*) has been updated.
- The entry for **revPlayAnimation** (*command*) has been updated.
- The entry for **revPreviewVideo** (*command*) has been updated.
- The entry for **revPrintField** (*command*) has been updated.
- The entry for **revPrintText** (*command*) has been updated.
- The entry for **revRecordVideo** (*command*) has been updated.
- The entry for **revRollBackDatabase** (*command*) has been updated.
- The entry for **revSetDatabaseDriverPath** (*command*) has been updated.
- The entry for **revSetSpeechPitch** (*command*) has been updated.
- The entry for **revSetSpeechSpeed** (*command*) has been updated.
- The entry for **revSetSpeechVoice** (*command*) has been updated.
- The entry for **revSetSpeechVolume** (*command*) has been updated.
- The entry for **revSetVideoGrabSettings** (*command*) has been updated.
- The entry for **revSetVideoGrabberRect** (*command*) has been updated.
- The entry for **revShowPrintDialog** (*command*) has been updated.
- The entry for **revSpeak** (*command*) has been updated.
- The entry for **revStopAnimation** (*command*) has been updated.
- The entry for **revStopPreviewingVideo** (*command*) has been updated.
- The entry for **revStopRecordingVideo** (*command*) has been updated.
- The entry for **revStopSpeech** (*command*) has been updated.
- The entry for **revUnloadSpeech** (*command*) has been updated.
- The entry for **revUpdateGeometry** (*command*) has been updated.
- The entry for **revVideoFrameImage** (*command*) has been updated.
- The entry for **revVideoGrabDialog** (*command*) has been updated.
- The entry for **revVideoGrabIdle** (*command*) has been updated.
- The entry for **revXMLAddDTD** (*command*) has been updated.
- The entry for **revXMLAddNode** (*command*) has been updated.
- The entry for **revXMLAppend** (*command*) has been updated.
- The entry for **revXMLCopyNode** (*command*) has been updated.
- The entry for **revXMLDeleteAllTrees** (*command*) has been updated.
- The entry for **revXMLDeleteNode** (*command*) has been updated.
- The entry for **revXMLDeleteTree** (*command*) has been updated.
- The entry for **revXMLInsertNode** (*command*) has been updated.
- The entry for **revXMLMoveNode** (*command*) has been updated.
- The entry for **revXMLPutIntoNode** (*command*) has been updated.
- The entry for **revXMLRPC\_AddParam** (*command*) has been updated.
- The entry for **revXMLRPC\_DeleteAllDocuments** (*command*) has been updated.
- The entry for **revXMLRPC\_DeleteDocument** (*command*) has been updated.
- The entry for **revXMLRPC\_GetMethod** (*command*) has been updated.



- The entry for **revXMLRPC\_SetHost** (*command*) has been updated.
- The entry for **revXMLRPC\_SetMethod** (*command*) has been updated.
- The entry for **revXMLRPC\_SetPath** (*command*) has been updated.
- The entry for **revXMLRPC\_SetPort** (*command*) has been updated.
- The entry for **revXMLRPC\_SetProtocol** (*command*) has been updated.
- The entry for **revXMLRPC\_SetSocket** (*command*) has been updated.
- The entry for **revXMLSetAttribute** (*command*) has been updated.
- The entry for **secure socket** (*command*) has been updated.
- The entry for **send** (*command*) has been updated.
- The entry for **undefine** (*command*) has been updated.
- The entry for **write to socket** (*command*) has been updated.
- The entry for **setProp** (*control structure*) has been updated.
- The entry for **switch** (*control structure*) has been updated.
- The entry for **URLStatus** (*function*) has been updated.
- The entry for **alternateLanguages** (*function*) has been updated.
- The entry for **buildNumber** (*function*) has been updated.
- The entry for **cachedURLs** (*function*) has been updated.
- The entry for **cipherNames** (*function*) has been updated.
- The entry for **clickLoc** (*function*) has been updated.
- The entry for **clickV** (*function*) has been updated.
- The entry for **colorNames** (*function*) has been updated.
- The entry for **commandArguments** (*function*) has been updated.
- The entry for **commandName** (*function*) has been updated.
- The entry for **commandNames** (*function*) has been updated.
- The entry for **constantNames** (*function*) has been updated.
- The entry for **flushEvents** (*function*) has been updated.
- The entry for **functionNames** (*function*) has been updated.
- The entry for **libURLErrorData** (*function*) has been updated.
- The entry for **libURLLastHTTPHeader** (*function*) has been updated.
- The entry for **libURLLastRHHeader** (*function*) has been updated.
- The entry for **libURLVersion** (*function*) has been updated.
- The entry for **libURLftpCommand** (*function*) has been updated.
- The entry for **libURLFormData** (*function*) has been updated.
- The entry for **libURLMultipartFormAddPart** (*function*) has been updated.
- The entry for **libURLMultipartFormData** (*function*) has been updated.
- The entry for **menus** (*function*) has been updated.
- The entry for **mobileGetLaunchData** (*function*) has been updated.
- The entry for **mobileStorePurchaseError** (*function*) has been updated.
- The entry for **mouseH** (*function*) has been updated.
- The entry for **mouseV** (*function*) has been updated.
- The entry for **openSockets** (*function*) has been updated.
- The entry for **propertyNames** (*function*) has been updated.
- The entry for **revAppVersion** (*function*) has been updated.
- The entry for **revBrowserOpen** (*function*) has been updated.
- The entry for **revBrowserOpenCef** (*function*) has been updated.
- The entry for **revCurrentRecord** (*function*) has been updated.
- The entry for **revCurrentRecordIsFirst** (*function*) has been updated.
- The entry for **revCurrentRecordIsLast** (*function*) has been updated.
- The entry for **revDataFromQuery** (*function*) has been updated.
- The entry for **revDatabaseColumnCount** (*function*) has been updated.
- The entry for **revDatabaseColumnIsNULL** (*function*) has been updated.
- The entry for **revDatabaseColumnLengths** (*function*) has been updated.
- The entry for **revDatabaseColumnName** (*function*) has been updated.
- The entry for **revDatabaseColumnNames** (*function*) has been updated.
- The entry for **revDatabaseColumnNumbered** (*function*) has been updated.

- The entry for **revDatabaseColumnTypes** (*function*) has been updated.
- The entry for **revDatabaseConnectResult** (*function*) has been updated.
- The entry for **revDatabaseCursors** (*function*) has been updated.
- The entry for **revDatabaseID** (*function*) has been updated.
- The entry for **revDatabaseType** (*function*) has been updated.
- The entry for **revGetDatabaseDriverPath** (*function*) has been updated.
- The entry for **revGetSpeechVolume** (*function*) has been updated.
- The entry for **revIsSpeaking** (*function*) has been updated.
- The entry for **revNumberOfRecords** (*function*) has been updated.
- The entry for **revOpenDatabases** (*function*) has been updated.
- The entry for **revQueryDatabase** (*function*) has been updated.
- The entry for **revQueryResult** (*function*) has been updated.
- The entry for **revSpeechVoices** (*function*) has been updated.
- The entry for **revXMLAttribute** (*function*) has been updated.
- The entry for **revXMLAttributeValues** (*function*) has been updated.
- The entry for **revXMLAttributes** (*function*) has been updated.
- The entry for **revXMLChildContents** (*function*) has been updated.
- The entry for **revXMLChildNames** (*function*) has been updated.
- The entry for **revXMLCreateTree** (*function*) has been updated.
- The entry for **revXMLCreateTreeFromFile** (*function*) has been updated.
- The entry for **revXMLCreateTreeFromFileWithNamespaces** (*function*) has been updated.
- The entry for **revXMLCreateTreeWithNamespaces** (*function*) has been updated.
- The entry for **revXMLFirstChild** (*function*) has been updated.
- The entry for **revXMLMatchingNode** (*function*) has been updated.
- The entry for **revXMLNextSibling** (*function*) has been updated.
- The entry for **revXMLNodeContents** (*function*) has been updated.
- The entry for **revXMLNumberOfChildren** (*function*) has been updated.
- The entry for **revXMLParent** (*function*) has been updated.
- The entry for **revXMLPreviousSibling** (*function*) has been updated.
- The entry for **revXMLRPC\_CreateRequest** (*function*) has been updated.
- The entry for **revXMLRPC\_Documents** (*function*) has been updated.
- The entry for **revXMLRPC\_Error** (*function*) has been updated.
- The entry for **revXMLRPC\_GetHost** (*function*) has been updated.
- The entry for **revXMLRPC\_GetPath** (*function*) has been updated.
- The entry for **revXMLRPC\_GetPort** (*function*) has been updated.
- The entry for **revXMLRPC\_GetProtocol** (*function*) has been updated.
- The entry for **revXMLRPC\_GetRequest** (*function*) has been updated.
- The entry for **revXMLRPC\_GetResponse** (*function*) has been updated.
- The entry for **revXMLRPC\_GetSocket** (*function*) has been updated.
- The entry for **revXMLRootNode** (*function*) has been updated.
- The entry for **revXMLText** (*function*) has been updated.
- The entry for **revXMLTree** (*function*) has been updated.
- The entry for **revXMLTrees** (*function*) has been updated.
- The entry for **revXMLValidateDTD** (*function*) has been updated.
- The entry for **revdb\_closecursor** (*function*) has been updated.
- The entry for **revdb\_commit** (*function*) has been updated.
- The entry for **revdb\_disconnect** (*function*) has been updated.
- The entry for **revdb\_execute** (*function*) has been updated.
- The entry for **revdb\_movefirst** (*function*) has been updated.
- The entry for **revdb\_movelast** (*function*) has been updated.
- The entry for **revdb\_movenext** (*function*) has been updated.
- The entry for **revdb\_moveprev** (*function*) has been updated.
- The entry for **revdb\_rollback** (*function*) has been updated.
- The entry for **specialFolderPath** (*function*) has been updated.
- The entry for **stackSpace** (*function*) has been updated.

- The entry for **tan** (*function*) has been updated.
- The entry for **time** (*function*) has been updated.
- The entry for **URL** (*keyword*) has been updated.
- The entry for **codepoint** (*keyword*) has been updated.
- The entry for **codepoints** (*keyword*) has been updated.
- The entry for **dateItems** (*keyword*) has been updated.
- The entry for **dateTime** (*keyword*) has been updated.
- The entry for **ftp** (*keyword*) has been updated.
- The entry for **http** (*keyword*) has been updated.
- The entry for **https** (*keyword*) has been updated.
- The entry for **inverse** (*keyword*) has been updated.
- The entry for **line** (*keyword*) has been updated.
- The entry for **token** (*keyword*) has been updated.
- The entry for **trueWord** (*keyword*) has been updated.
- The entry for **trueWords** (*keyword*) has been updated.
- The entry for **purchaseStateUpdate** (*message*) has been updated.
- The entry for **remoteControlReceived** (*function*) has been updated.
- The entry for **socketClosed** (*message*) has been updated.
- The entry for **socketError** (*message*) has been updated.
- The entry for **socketTimeout** (*message*) has been updated.
- The entry for **AndroidBrowser** (*object*) has been updated.
- The entry for **iosBrowser** (*object*) has been updated.
- The entry for **and** (*operator*) has been updated.
- The entry for **or** (*operator*) has been updated.
- The entry for **HTMLText** (*property*) has been updated.
- The entry for **activatePalettes** (*property*) has been updated.
- The entry for **allowFieldRedraw** (*property*) has been updated.
- The entry for **allowKeyInField** (*property*) has been updated.
- The entry for **blindTyping** (*property*) has been updated.
- The entry for **caseSensitive** (*property*) has been updated.
- The entry for **checkmark** (*property*) has been updated.
- The entry for **clipboardData** (*property*) has been updated.
- The entry for **commandChar** (*property*) has been updated.
- The entry for **draggable** (*property*) has been updated.
- The entry for **editScripts** (*property*) has been updated.
- The entry for **freeSize** (*property*) has been updated.
- The entry for **innerGlow** (*property*) has been updated.
- The entry for **longWindowTitles** (*property*) has been updated.
- The entry for **markChar** (*property*) has been updated.
- The entry for **menuMessage** (*property*) has been updated.
- The entry for **multiEffect** (*property*) has been updated.
- The entry for **multiSpace** (*property*) has been updated.
- The entry for **multiple** (*property*) has been updated.
- The entry for **password** (*property*) has been updated.
- The entry for **penBack** (*property*) has been updated.
- The entry for **powerKeys** (*property*) has been updated.
- The entry for **printTextAlign** (*property*) has been updated.
- The entry for **printTextFont** (*property*) has been updated.
- The entry for **printTextHeight** (*property*) has been updated.
- The entry for **printTextSize** (*property*) has been updated.
- The entry for **printTextStyle** (*property*) has been updated.
- The entry for **remapColor** (*property*) has been updated.
- The entry for **serialControlString** (*property*) has been updated.
- The entry for **showPict** (*property*) has been updated.
- The entry for **size** (*property*) has been updated.

- The entry for **socketTimeoutInterval** (*property*) has been updated.
- The entry for **soundChannel** (*property*) has been updated.
- The entry for **sslCertificates** (*property*) has been updated.
- The entry for **stackFiles** (*property*) has been updated.
- The entry for **userLevel** (*property*) has been updated.
- The entry for **userModify** (*property*) has been updated.
- The entry for **wideMargins** (*property*) has been updated.

## Previous Release Notes

7.1.0 Release Notes	<a href="http://downloads.livecode.com/livecode/7_1_0/LiveCodeNotes-7_1_0.pdf">http://downloads.livecode.com/livecode/7_1_0/LiveCodeNotes-7_1_0.pdf</a>
7.0.6 Release Notes	<a href="http://downloads.livecode.com/livecode/7_0_6/LiveCodeNotes-7_0_6.pdf">http://downloads.livecode.com/livecode/7_0_6/LiveCodeNotes-7_0_6.pdf</a>
7.0.4 Release Notes	<a href="http://downloads.livecode.com/livecode/7_0_4/LiveCodeNotes-7_0_4.pdf">http://downloads.livecode.com/livecode/7_0_4/LiveCodeNotes-7_0_4.pdf</a>
7.0.3 Release Notes	<a href="http://downloads.livecode.com/livecode/7_0_3/LiveCodeNotes-7_0_3.pdf">http://downloads.livecode.com/livecode/7_0_3/LiveCodeNotes-7_0_3.pdf</a>
7.0.1 Release Notes	<a href="http://downloads.livecode.com/livecode/7_0_1/LiveCodeNotes-7_0_1.pdf">http://downloads.livecode.com/livecode/7_0_1/LiveCodeNotes-7_0_1.pdf</a>
7.0.0 Release Notes	<a href="http://downloads.livecode.com/livecode/7_0_0/LiveCodeNotes-7_0_0.pdf">http://downloads.livecode.com/livecode/7_0_0/LiveCodeNotes-7_0_0.pdf</a>
6.7.7 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_7/LiveCodeNotes-6_7_7.pdf">http://downloads.livecode.com/livecode/6_7_7/LiveCodeNotes-6_7_7.pdf</a>
6.7.6 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_6/LiveCodeNotes-6_7_6.pdf">http://downloads.livecode.com/livecode/6_7_6/LiveCodeNotes-6_7_6.pdf</a>
6.7.4 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_4/LiveCodeNotes-6_7_4.pdf">http://downloads.livecode.com/livecode/6_7_4/LiveCodeNotes-6_7_4.pdf</a>
6.7.2 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_2/LiveCodeNotes-6_7_2.pdf">http://downloads.livecode.com/livecode/6_7_2/LiveCodeNotes-6_7_2.pdf</a>
6.7.1 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_1/LiveCodeNotes-6_7_1.pdf">http://downloads.livecode.com/livecode/6_7_1/LiveCodeNotes-6_7_1.pdf</a>
6.7.0 Release Notes	<a href="http://downloads.livecode.com/livecode/6_7_0/LiveCodeNotes-6_7_0.pdf">http://downloads.livecode.com/livecode/6_7_0/LiveCodeNotes-6_7_0.pdf</a>
6.6.2 Release Notes	<a href="http://downloads.livecode.com/livecode/6_6_2/LiveCodeNotes-6_6_2.pdf">http://downloads.livecode.com/livecode/6_6_2/LiveCodeNotes-6_6_2.pdf</a>
6.6.1 Release Notes	<a href="http://downloads.livecode.com/livecode/6_6_1/LiveCodeNotes-6_6_1.pdf">http://downloads.livecode.com/livecode/6_6_1/LiveCodeNotes-6_6_1.pdf</a>
6.6.0 Release Notes	<a href="http://downloads.livecode.com/livecode/6_6_0/LiveCodeNotes-6_6_0.pdf">http://downloads.livecode.com/livecode/6_6_0/LiveCodeNotes-6_6_0.pdf</a>
6.5.2 Release Notes	<a href="http://downloads.livecode.com/livecode/6_5_2/LiveCodeNotes-6_5_2.pdf">http://downloads.livecode.com/livecode/6_5_2/LiveCodeNotes-6_5_2.pdf</a>
6.5.1 Release Notes	<a href="http://downloads.livecode.com/livecode/6_5_1/LiveCodeNotes-6_5_1.pdf">http://downloads.livecode.com/livecode/6_5_1/LiveCodeNotes-6_5_1.pdf</a>
6.5.0 Release Notes	<a href="http://downloads.livecode.com/livecode/6_5_0/LiveCodeNotes-6_5_0.pdf">http://downloads.livecode.com/livecode/6_5_0/LiveCodeNotes-6_5_0.pdf</a>
6.1.3 Release Notes	<a href="http://downloads.livecode.com/livecode/6_1_3/LiveCodeNotes-6_1_3.pdf">http://downloads.livecode.com/livecode/6_1_3/LiveCodeNotes-6_1_3.pdf</a>
6.1.2 Release Notes	<a href="http://downloads.livecode.com/livecode/6_1_2/LiveCodeNotes-6_1_2.pdf">http://downloads.livecode.com/livecode/6_1_2/LiveCodeNotes-6_1_2.pdf</a>