

# Beginning ScriptUI

ScriptUI is a module in the Adobe CS family (starting in CS3) with which dialogs can be added to scripts written in JavaScript. The module is included in each version of the ExtendScript Toolkit, and dialogs written in it can be used in scripts targetted at all CS applications. Though this guide deals only with InDesign as a target application, virtually everything covered here applies to scripts written for other CS apps too. This guide is for ScriptUI only: it is assumed that you are more or less proficient in JavaScript.

To my knowledge, the only documentation available on ScriptUI is a chapter in JavaScript Tools Guide CS $n$ .pdf (where  $n$  stands for a CS version), which is included with every version of the ESTK and can be found in the Help menu (in CS3 and CS4, look in the SDK submenu of the Help menu). That chapter (referred to in this text as "the Tools Guide") is a complete reference for the ScriptUI environment, but it is a bit short on examples here and there. The present guide does not repeat the full reference; rather, it should be seen as a companion to it.

A reference guide is also available in the object-model viewer in the ESTK/CS4-5. Furthermore, Jongware's CS object browsers include a version for ScriptUI (see <http://www.jongware.com/idjshelp.html>).

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## Contents

<b>Hello world</b>	1	dropdownlist	29
<b>Dialog vs palette</b>	1	Separators	29
Dialog	1	treeview	30
Palette	1	Removing items and nodes from treeviews	31
Differences across applications	2	Adding items to a treeview	32
<b>Adding controls</b>	2	Expanding all nodes and their subnodes	34
<b>Getting started: An example</b>	3	Moving items and nodes: processing treeviews	36
Groups and panels	4	Writing a treeview as XML	39
Formatting the window frame	6	Images in treeviews	41
<b>Creation properties and other properties</b>	7	tabbedpanel	41
<b>Controls</b>	7	progressbar	42
statictext	7	Lists as progress indicators	43
edittext	7	image	44
Example: scrollable alert	9	Resizing images	45
Controlling edit fields	9	slider	45
button	10	flashplayer	46
Push buttons	10	Adding shortcut keys to controls	46
Responding to button presses	10	<b>Labelling controls</b>	47
Icon buttons	11	<b>Size and position</b>	48
State-sensitive iconbuttons	12	<b>Resizing windows</b>	49
Using application icons	12	<b>Communication between windows</b>	50
Using inDesign's icons	13	<b>Fonts</b>	52
checkbox	13	<b>Colours</b>	53
radiobutton	14	<b>Lines</b>	54
Multiple groups act as one	16	<b>Callbacks</b>	56
listbox	17	<b>Event handlers</b>	57
Finding out which item is selected	19	Monitoring the mouse	57
Finding out which item is selected in multi-select lists	20	Determining which button is pressed	58
Processing lists	20	Listening to the keyboard	59
Finding items in a list	20	Using the up and down arrow keys to change numerical data	60
Using find() to make selections in a list	21	Selecting items in dropdowns using the keyboard	61
Inserting items into a list	21	<b>Coding styles: resource string and code based</b>	64
Keeping a list sorted	21	Resource string	64
Moving list items	22	Code-based object	66
Removing items from a list	23	Mixing styles	66
Selecting vs. revealing items	24	<b>Displaying properties and methods</b>	67
Including images in a list	26	<b>Resources</b>	68
Multi-column lists	26	Blogs	69
Type-ahead lists: select while you type	27	Some useful forum topics	69

Interactive dialog builders.....70

**Acknowledgements.....70**

**Appendix 1: ESTK resource icons .....71**

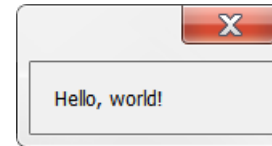
**Revision details.....73**

## Hello world

Inevitably, the simplest window is one that prints a message on the screen. Here is an example that displays a simple ScriptUI window, showing the bare basics of a ScriptUI window:

```
var myWindow = new Window ("dialog");  
var myMessage = myWindow.add ("statictext");  
myMessage.text = "Hello, world!";  
myWindow.show ( );
```

The first line defines a new window of type **dialog**; the second line adds a **control** to the window, here a **statictext** item; the third line sets the content of the statictext control; the last line displays the window. To dismiss the dialog, press the exit cross in the top right of the dialog. Later we'll see how to dismiss dialogs more elegantly.



## Dialog vs palette

There are two types of window: dialog and palette. You're already familiar with the difference between the two because they reflect the way that windows behave in InDesign. A **dialog** remains visible as long as you interact with it, and while it is visible you can't do anything else. Examples are the Text Frame Options and the Paragraph Rules dialogs: only after dismissing these dialogs can you continue to work in InDesign. On the other hand, if a **palette** is displayed on the screen you can continue to work in InDesign. In InDesign's UI you have the Paragraph and Character palettes (called 'panels' since CS4): you can work while these palettes are displayed.

InDesign's UI dialogs and palettes are visually distinct in that dialogs have OK and Cancel buttons, while palettes do not. But this difference doesn't necessarily hold in ScriptUI: you can do a palette with OK and Cancel buttons if you feel like it, and you could do a dialog without them (though that wouldn't be a very useful dialog).

In fact, scriptUI has a third window type, "window", which appears to behave like a palette in many ways. Windows, unlike palettes, have minimise and maximise buttons. You don't see it used much and I won't deal with them in this guide.

## Dialog

The Hello World script creates a dialog-type window.

## Palette

To create a palette-style window you need to specify the window as a palette and you need to target an engine. The Hello World example can be turned into a palette as follows:

```
#targetengine "session"; // not needed in Illustrator/AfterEffects
```

```
var myWindow = new Window ("palette");  
var myMessage = myWindow.add ("statictext");  
myMessage.text = "Hello, world!";  
myWindow.show ( );
```

The window displayed by this script looks exactly the same as the dialog-type window. When you try both scripts, you'll see that while the palette is displayed you can work in InDesign; but with the dialog displayed you can't do anything until you dismiss it.

There is a small cosmetic difference between dialogs and palettes (in Windows, anyway): dialogs have round corners and a larger close button, palettes have straight corners and a smaller close button.

As a matter of interest but of no importance at all, InDesign's dialog-type windows have rounded corners but have no close button (Textframe Options, Paragraph Style Options, etc.), while its palette-style windows have straight corners and do have a close button (Find/Change, Convert URLs to Hyperlinks, etc.).

## Differences across applications

There are some differences in the behaviour of ScriptUI windows in the different CS applications. A substantial difference is that palettes can't be used in PhotoShop. There are also some small cosmetic differences. For instance, PhotoShop and AfterEffects dialogs have small icon on the left in the window bar (see screenshot). Other differences aren't worth mentioning.

## Adding controls

In the Hello World example we encountered our first control: **statictext**. This type of control, as we saw earlier, just adds some text to a window. Though the two-line method we used there (adding the control, then use a separate line to add the text) is fine, it could also have been stated as follows:

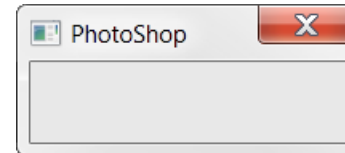
```
var myMessage = myWindow.add ("statictext", undefined, "Hello, world!");
```

that is, writing the text's contents as a parameter of the **.add ( )** method. From here on we'll use this one-line method in all examples.

**undefined** in this line is a placeholder for a parameter that we won't deal with here, namely, the size and position of the text within the window or other type of container (later we'll return to containers within a window).

In CS3 and CS4 you can use palettes only if you run the script from the scripts panel. Once run from there, you can run the script from the ESTK. In CS5, palettes can be run from the ESTK from the first run. These limitations are Windows only (I think).

The **#targetengine** directive is not needed in Illustrator and AfterEffects



## Getting started: An example

Before going into the details of all other controls, we'll first construct a simple script to illustrate the main elements of ScriptUI's window features. In discussing this simple example you also see how you often go about constructing a window, which in effect is like constructing most things: you first add the basic things, then refine these to make it more manageable and to make it look better. We'll create a script that asks a user for some input.

Text entry is done using the **edittext** control. To make sense of an edit field, you need to add a prompt separately using a **statictext** control. Here's the first attempt:

```
var myWindow = new Window ("dialog", "Form");
myWindow.add ("statictext", undefined, "Name:");
var myText = myWindow.add ("edittext");
myWindow.show ();
```

Note first that we added a title to the window ("Form"). Also note that the edit field appears below the prompt, which is not what we want. Apparently, a window's default orientation is **column**. To change that to **row**, we need to include a statement to that effect:

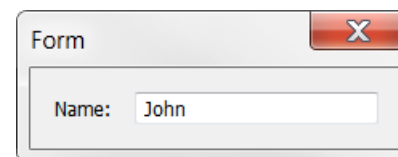
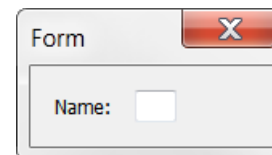
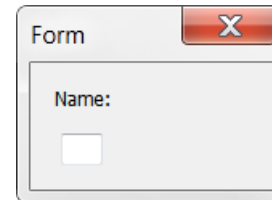
```
var myWindow = new Window ("dialog", "Form");
myWindow.orientation = "row";
myWindow.add ("statictext", undefined, "Name:");
var myText = myWindow.add ("edittext");
myWindow.show ();
```

The second line in the script sets the window's orientation. This looks a bit better, but the edit field is much too small. In addition, we would like to add some default text:

```
var myWindow = new Window ("dialog", "Form");
myWindow.orientation = "row";
myWindow.add ("statictext", undefined, "Name:");
var myText = myWindow.add ("edittext", undefined, "John");
myText.characters = 30;
myWindow.show ();
```

You can set the width of an edittext control using its **characters** property. Later we'll see other ways to size controls.

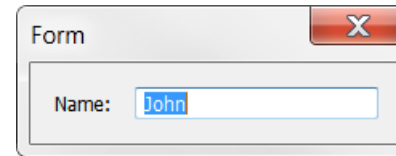
The dialog looks better now, but it would be useful if the edit field were activated when the window is displayed so that the user needn't place the cursor there. This is done by including a line **myText.active = true;**



```

var myWindow = new Window ("dialog", "Form");
myWindow.orientation = "row";
myWindow.add ("statictext", undefined, "Name:");
var myText = myWindow.add ("edittext", undefined, "John");
myText.characters = 30;
myText.active = true;
myWindow.show ();

```

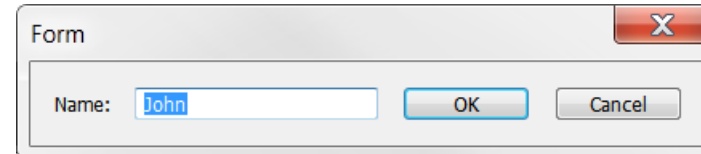


Now we want to add some buttons, in this case the usual OK and Cancel buttons. We do this using the **button** control:

```

var myWindow = new Window ("dialog", "Form");
myWindow.orientation = "row";
myWindow.add ("statictext", undefined, "Name:");
var myText = myWindow.add ("edittext", undefined, "John");
myText.characters = 20;
myText.active = true;
myWindow.add ("button", undefined, "OK");
myWindow.add ("button", undefined, "Cancel");
myWindow.show ();

```



## Groups and panels

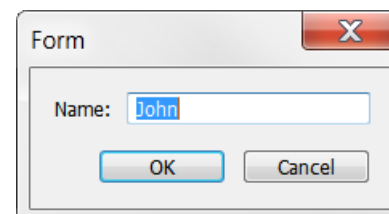
Because we set the window's orientation to row, all items we add are placed on the same row, but that's not what we want. To change this, we can **group** items together using the ScriptUI items **group** and **panel**. These two function the same in that they group items together, but differ in two ways: panels have a border, groups don't; and the default orientation of a group is row, that of a panel, column.

So what we want to do now is to create two groups: one with the statictext and the edittext controls, the other with the two buttons. This can be done as follows:

```

var myWindow = new Window ("dialog", "Form");
var myInputGroup = myWindow.add ("group");
myInputGroup.add ("statictext", undefined, "Name:");
var myText = myInputGroup.add ("edittext", undefined, "John");
myText.characters = 20;
myText.active = true;
var myButtonGroup = myWindow.add ("group");
myButtonGroup.alignment = "right";
myButtonGroup.add ("button", undefined, "OK");
myButtonGroup.add ("button", undefined, "Cancel");
myWindow.show ();

```



We defined two groups, **myInputGroup** and **myButtonGroup**. Note that we deleted the line that sets the window's orientation because it's not needed anymore: the window has just two items (the two groups), and since the Window's default orientation is column, there's no need to state it. Similarly, since the default orientation of groups is row, there's no need to set the orientation in the groups. Note that we aligned the button group to the right of the window using **alignment** – a small detail but I need it later on.

Groups (and panels) are good layout tools when you script windows. If used well, your windows are easily adaptable. For instance, if you want the buttons vertically aligned and to the right of the input group, all you need to do is add two orientation statements – these are marked green in the following example:

```
var myWindow = new Window ("dialog", "Form");
myWindow.orientation = "row";
var myInputGroup = myWindow.add ("group");
myInputGroup.add ("statictext", undefined, "Name:");
var myText = myInputGroup.add ("edittext", undefined, "John");
myText.characters = 20;
myText.active = true;
var myButtonGroup = myWindow.add ("group");
myButtonGroup.orientation = "column";
myButtonGroup.add ("button", undefined, "OK");
myButtonGroup.add ("button", undefined, "Cancel");
myWindow.show ();
```

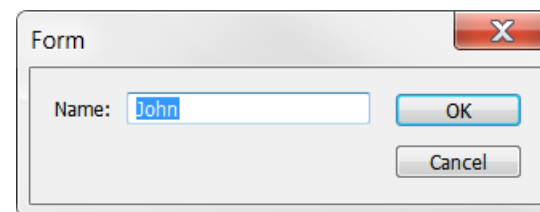
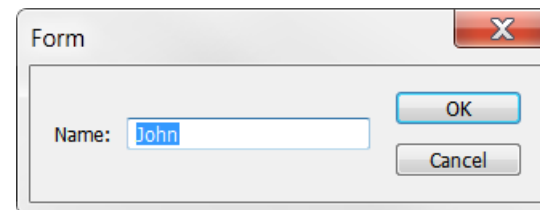
A final tweak might be to align the two groups vertically. To do this, add this line to the script; just before or after the second line makes sense:

```
myWindow.alignChildren = "top";
```

The script's window is now displayed as shown on the right.

We'll decide that the window is good enough for our purposes, and now we turn to the question of how to deal with the user's input and how to use that input in the rest of the script. In this example, two things can happen: the user clicks OK (which in this script corresponds to pressing Enter) or they can click Cancel (which is the equivalent of pressing Escape). The window's behaviour is this: if the user presses OK, the line **myWindow.show ()** returns 1, if they press Esc, that line returns 2. We capture this as follows:

```
if (myWindow.show () == 1)
    var myName = myText.text;
else
    exit ();
```





In this case we needn't check for Esc because there are just two options, namely, OK and Cancel. So if the user didn't press OK they must have pressed Cancel. Anyway, if OK was pressed we want to return to the script the contents of the edittext control, which is **myText.text**. In conclusion, here is the whole script, packed in a function as you would probably do:

```
var myName = myInput ();
// rest of the script

function myInput ()
{
    var myWindow = new Window ("dialog", "Form");
    var myInputGroup = myWindow.add ("group");
    myInputGroup.add ("statictext", undefined, "Name:");
    var myText = myInputGroup.add ("edittext", undefined, "John");
    myText.characters = 20;
    myText.active = true;
    var myButtonGroup = myWindow.add ("group");
    myButtonGroup.alignment = "right";
    myButtonGroup.add ("button", undefined, "OK");
    myButtonGroup.add ("button", undefined, "Cancel");
    if (myWindow.show () == 1)
        return myText.text;
    else
        exit ();
}
```

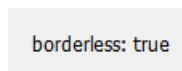
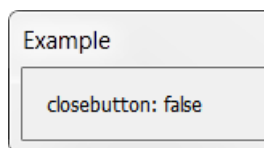
## Formatting the window frame

There are some properties that determine the look of palettes and dialogs. You can opt to suppress the close button on the frame (from now on I'll use **w** for the Window variable instead of **myWindow**):

```
w = new Window ("dialog", "Example", undefined, {closeButton: false});
w.add ("statictext", undefined, "closebutton: false");
w.show ();
```

You can do borderless frames, too:

```
w = new Window ("dialog", undefined, undefined, {borderless: true});
w.add ("statictext", undefined, "borderless: true");
w.show ();
```



But these borderless frames are pretty minimalistic in that they are in fact just grey panels. You can make them look better by adding a thin frame to them, as follows:

```
w = new Window ("dialog", undefined, undefined, {borderless: true});
w.margins = [0,0,0,0];
myPanel = w.add ("panel");
myPanel.add ("statictext", undefined, "borderless: not quite true");
w.show ();
```

borderless: not quite true

You'll notice, naturally, that the frame is not a border on the window but that of the panel.

Now that we've seen the basics of windows, we'll turn to the building blocks in some detail.

## Creation properties and other properties

Windows and their controls can be modified by two types of property: a creation property or a normal property. Creation properties are so called because they must be specified when the control is created; normal, non-creation, properties can be set at any time.

There are numerous examples in this guide of both types. For instance, in the example that prints "borderless: not quite true", above, **{borderless: true}** is a creation property: the window's frame is set as borderless in the same line that creates the window. It's not possible to set that property later on in the script.

In contrast, **margins** is not a creation property. A control's margins can be set at any time. In the script, **w.margins = [0,0,0,0]** immediately follows the line at which the window is created, but that's not necessary: the margins can be set anywhere in the script.

## Controls

### statictext

Mentioned here for completeness' sake. Not much more can be said about **statictext** than we already have; it's used in many of the examples throughout this guide.

### edittext

This control too we've seen in the example given above. It is used to get input from the user. By default, the control is just one line high and you can enter just

one line of text. A useful creation property is **multiline**, which allows you to add more than one line:

```
var w = new Window ("dialog", "Multiline");
var myText = w.add ("edittext", [0, 0, 150, 70], "", {multiline: true});
myText.text = "Line 1\rLine 2\rLine 3\rLine 4\rLine 5\rLine 6\r";
myText.active = true;
w.show ();
```

In the screenshot we've added a few lines. As you can see, we specified the size of the control in the second argument position ([0, 0, 150, 70]) – these dimensions are left, top, width, and height. (Note that these coordinates differ from those of InDesign's geometricBounds, which are top, left, bottom, right.) When more text is entered than fits the control, a scrollbar is added by default. To disable the scrollbar, use the creation property **scrolling**:

```
var myText = w.add ("edittext", [0, 0, 150, 70], "", {multiline: true, scrolling: false});
```

Although the control is called **edittext**, its edit possibilities are very limited when you target InDesign (PhotoShop and the ESTK itself don't have this problem). You can't cut and paste using keyboard shortcuts (Ctrl+C and Ctrl+V on Windows) though you can right-click in the edit window and use Copy and Paste from the context menu. The Enter/Return key doesn't work: in CS3 and CS5 you can use Ctrl+Num Enter (Enter on the Mac); in CS4 there's a real problem with the Enter key in the edittext control – there's not much you can do about it.

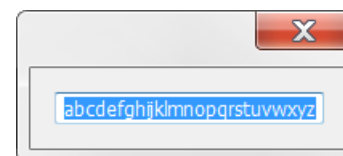
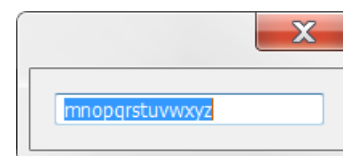
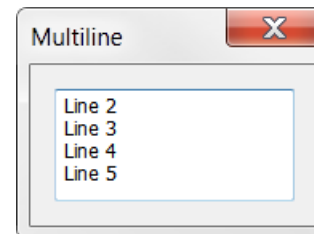
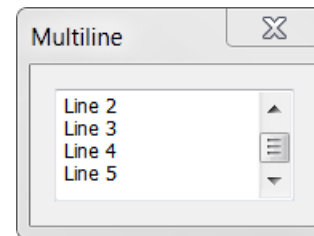
A **problem in Windows** is that if the script preselects some text, sometimes that text is not displayed correctly. Take this script:

```
var w = new Window ("dialog");
var e = w.add ("edittext", undefined, "abcdefghijklmnopqrstuvwxyz");
e.active = true;
w.show();
```

As you can see, the text field is sized correctly but the text is not fitted to the box. To remedy this, add the line highlighted in green:

```
w = new Window ("dialog");
e = w.add ("edittext", undefined, "abcdefghijklmnopqrstuvwxyz");
w.layout.layout();
e.active = true;
w.show();
```

We'll not go into the details of **layout()** here, but will return to it later.



### Example: scrollable alert

You can have a script display text, but InDesign's native **display ()** is a bit limited in that it's not good at handling large amounts of text. It's not so difficult, however, to write your own display method so that you get a scrollable window. An additional advantage is that you can copy text out of that window. Here is the script, which I use a lot myself.

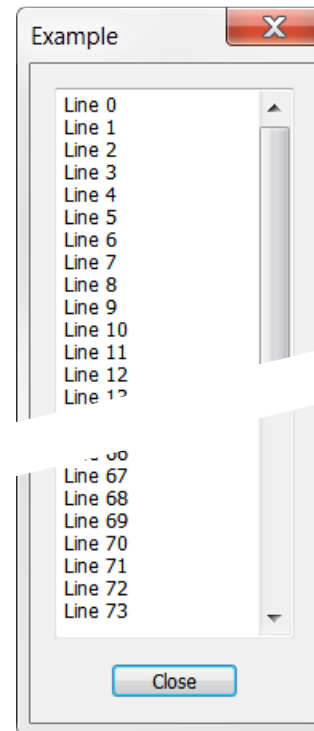
```
// create an example array
array = [];
for (i = 0; i < 150; i++)
    array.push ("Line " + String(i));
alert_scroll ("Example", array);

function alert_scroll (title, input) // string, string/array
{
    // if input is an array, convert it to a string
    if (input instanceof Array)
        input = input.join ("\r");
    var w = new Window ("dialog", title);
    var list = w.add ("edittext", undefined, input, {multiline: true, scrolling: true});
    // the list should not be bigger than the maximum possible height of the window
    list.maximumSize.height = w.maximumSize.height - 100;
    list.minimumSize.width = 150;
    w.add ("button", undefined, "Close", {name: "ok"});
    w.show ();
}
```

This function has one drawback, namely, when you input large amounts of text or a big array, it takes a while to display it.

### Controlling edit fields

Controls of type edittext are the only type of input in ScriptUI. There are no special controls for numbers, measurement units, etc. If you want input controls for numbers and measurements, you'll have to write them yourself. But though the edit field is text only, ScriptUI provides several tools to make the edittext control more flexible so that you can create your own numerical and measurement controls. The section on event listeners gives an example of how to increment and decrement numerical values using the up and down arrow keys.



## button

### Push buttons

You can use various types of button. Earlier we saw the standard pushbuttons OK and Cancel which are often used in windows:

```
var w = new Window ("dialog");
w.add ("button", undefined, "OK");
w.add ("button", undefined, "Cancel");
w.show ();
```

By default, an OK button responds to pressing the Enter key, a Cancel button to the Escape key. But these buttons show this behaviour only when the button's text is OK or Cancel. The Tools Guide therefore recommends to include the creation property **name: "ok"** to ensure that OK buttons behave appropriately in localised versions of InDesign and when you want to use some text for a button other than OK:

```
var w = new Window ("dialog");
w.add ("button", undefined, "Yes", {name: "ok"});
w.add ("button", undefined, "No", {name: "cancel"});
w.show ();
```

In this example, the Yes button behaves like an OK button and the No button like a Cancel button. (The **name** property can also be used for finding buttons and other controls in windows; see the section on communicating between windows, below, for examples and discussion.)

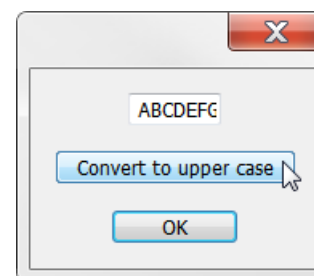
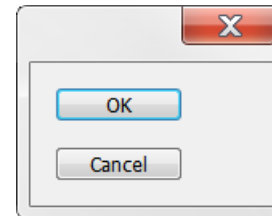
### Responding to button presses

The behaviour of buttons other than OK and Cancel buttons must be coded explicitly. You do this with a so-called **callback**, in this case **onClick**. Here is an example:

```
var w = new Window ("dialog");
var e = w.add ("edittext", undefined, "Abcdefg");
var convert_button = w.add ("button", undefined, "Convert to upper case");
w.add ("button", undefined, "OK");

convert_button.onClick = function () {e.text = e.text.toUpperCase();}
w.show ();
```

Clicking **Convert to upper case** converts the text in the edit field to upper case. This is a simple example, but the functions called by **onClick** can be of any complexity. (There are several other types of callback, which we will deal with later.)



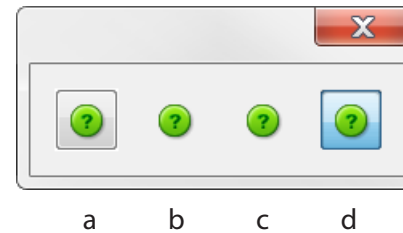
## Icon buttons

Apart from these standard push buttons you can use icon buttons. These display not text such as OK but an image. The image should be in PNG, IDRC, or JPEG format. The following format is used:

```
w.add ("iconbutton", undefined, File (myFile));
```

This adds a button which is like a pushbutton with an image instead of text (button **a** in the screenshot on the right). Buttons can also be added as toolbuttons, so that just the image is shown, not the button itself (button **b**). Finally, buttons can be made to toggle; buttons **c** and **d** in the screenshot are toggling toolbuttons: **c** is not pressed, **d** is. Here is the code:

```
var w = new Window ("dialog");
w.orientation = "row";
var f = File ("/d/test/icon.png")
w.add ("iconbutton", undefined, f ); // a
w.add ("iconbutton", undefined, f, {style: "toolbutton"}); // b
var t1 = w.add ("iconbutton", undefined, f, {style: "toolbutton", toggle: true}); // c
var t2 = w.add ("iconbutton", undefined, f, {style: "toolbutton", toggle: true}); // d
t2.value = true;
w.show ();
```



Examples of toggling toolbuttons in InDesign's interface can be found in the Text and GREP tabs of the Find/Change dialog: the buttons to determine whether or not to include footnotes, master pages, etc. in the search. The state of a toggle button is off by default, but can be enabled by setting its **value** property to true, as in the example, above. This property is used when you test the state of a toggling icon button: **if (t1.value == true).**

The creation properties **style** and **toggle** are meaningful only if used for icon buttons; they have no effect when included with normal buttons.

It's good practice to allow for the possibility that an icon file can't be found, e.g by adding a fallback:

```
var f = File ("/d/test/icon.idrc");
try {var b = w.add ("iconbutton", undefined, f )}
catch (_) {var b = w.add ("button", undefined, "@")}
```

This code tries to create an icon button using "icon.idrc", and if that icon can't be found, a normal button is added with the text @.

## State-sensitive iconbuttons

Icon buttons can be made mouse-sensitive by defining a list of images rather than a single one. They must be defined as a parameter of ScriptUI's image object. Here is an example:

```
var dir = "/d/scriptui/fig/";
var icons = {a: File(dir+"icon-a.png"), b: File(dir+"icon-b.png"),
             c: File(dir+"icon-c.png"), d: File(dir+"icon-d.png")}

var w = new Window("dialog");
w.add ("iconbutton", undefined, ScriptUI.newImage (icons.a, icons.b, icons.c, icons.d));
w.show();
```

The first icon in the list (here, **icon.a**) is the default and is shown when the window is drawn. The second one I don't know; the third one (c) becomes visible when you click the button; the last one is activated on mouse over.

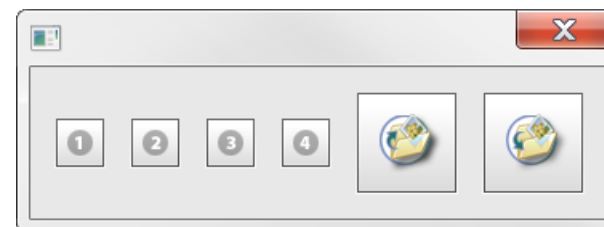
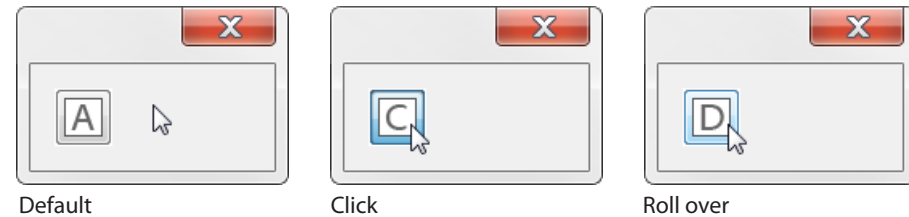
## Using application icons

A tantalising feature of ScriptUI is its ability to use application icons in its windows. I say "tantalising" because this feature is hopelessly undocumented: just one remark in the Tools Guide, no further examples or overviews of the resource names. This is a shame, because access to system resources means that you don't have to worry about the presence of icons: they must be there since the application is there.

Here is an example from PhotoShop:

```
#target photoshop;
var w = new Window ("dialog");
w.orientation = "row";
w.add ("iconbutton", undefined, "Step1Icon");
w.add ("iconbutton", undefined, "Step2Icon");
w.add ("iconbutton", undefined, "Step3Icon");
w.add ("iconbutton", undefined, "Step4Icon");
w.add ("iconbutton", undefined, "SourceFolderIcon");
w.add ("iconbutton", undefined, "DestinationFolderIcon");
w.show();
```

There must be many more, but thus far the names of the resource icons remain a well-guarded secret. More luck with the ESTK's icons. The following script shows a few icons (a longer list is in the appendix):

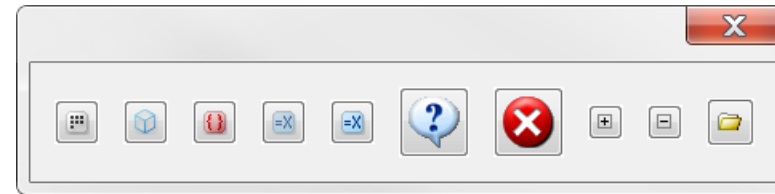


```
#target estoolkit;
w = new Window ("dialog"); w.orientation = "row";
w.add("iconbutton", undefined, "#Enumeration");
w.add("iconbutton", undefined, "#Class");
w.add("iconbutton", undefined, "#Method");
w.add("iconbutton", undefined, "#PropertyRO");
w.add("iconbutton", undefined, "#PropertyRW");
w.add("iconbutton", undefined, "SystemQueryIcon");
w.add("iconbutton", undefined, "SystemStopIcon");
w.add("iconbutton", undefined, "SystemExpand");
w.add("iconbutton", undefined, "SystemCollapse");
w.add("iconbutton", undefined, "#FolderOpened");
w.show();
```

### Using inDesign's icons

InDesign CS5 appears to take a different approach in that it stores its icons as graphic files. They are stored in InDesign's subfolders under **Adobe InDesign CS5/Plug-Ins**, which contains nineteen subfolders, which in turn contain subfolders. The subfolders called **idrc\_PNGA** and **idrc\_PNGR** contain several icons. (Thanks to Dirk Becker for pointing this out.) These two folders contain the same icons but their colour is a bit different: InDesign uses these two versions of each icon to show the difference when you mouse over them.

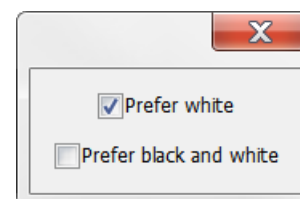
The icon files have the file extension **.idrc** but they're standard PNG files which ScriptUI has no difficulty reading (but PhotoShop can't read them). You could in principle write a script that uses InDesign's icons from InDesign's icon folders, but unfortunately InDesign's folder structures on Mac and PC are different and it's a bit of a hassle reliably to find the icons. It's easiest and safest to find the icon, create a resource folder on your (or your client's) computer, and keep the icons there. For an overview of all icons, see this [catalogue](#).



### checkbox

Here is an example of a window with some checkboxes. Optionally you can tick any of the boxes when the window is displayed by setting the their **value** property to **true**:

```
var w = new Window ("dialog");
var check1 = w.add ("checkbox", undefined, "Prefer white");
var check2 = w.add ("checkbox", undefined, "Prefer black and white");
check1.value = true;
w.show ();
```





Here we see another window layout default: within a container, items are centred horizontally. This can be changed with the **alignChildren** property:

```
var w = new Window ("dialog");
w.alignChildren = "left";
var check1 = w.add ("checkbox", undefined, "Prefer white");
var check2 = w.add ("checkbox", undefined, "Prefer black and white");
check1.value = true;
w.show ();
```

Note that the text label is much too close to the checkbox. The only way to do something about that is to add a space. But if you add a normal space, the end of the text gets chopped off (see the second checkbox in the following screenshot). To fix it, you need to add a non-breaking space (\u00A0); the effect can be seen in the third line.

```
var w = new Window ("dialog");
w.alignChildren = "left";
w.add ("checkbox", undefined, "Prefer mixed");
w.add ("checkbox", undefined, " Prefer mixed ");
w.add ("checkbox", undefined, "\u00A0Prefer mixed");
w.show ();
```

In CS5 the \u00A0 should be added at the beginning of the label; in CS4, at the end. This is a problem of InDesign and the ESTK on Windows in checkboxes and radiobuttons only; PhotoShop and all CS apps on Macs don't have this problem.

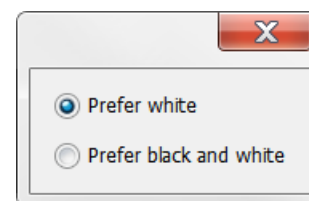
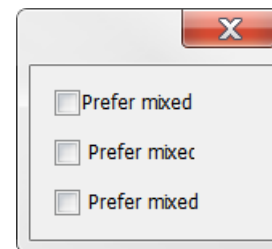
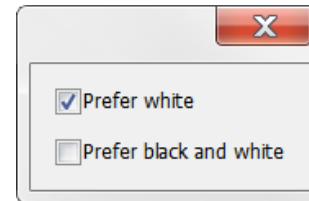
You check whether a checkbox was ticked by comparing its value property:

```
if (check1.value == true)
    return whatever
```

## radiobutton

Radio buttons are like checkboxes, but whereas you can tick all checkboxes in a container (a window, panel, group, or tabbed panel), in a container with radiobuttons only one of the buttons can be selected. Here is an example of a window with some radio buttons.

```
var w = new Window ("dialog");
w.alignChildren = "left";
var radio1 = w.add ("radiobutton", undefined, "Prefer white");
var radio2 = w.add ("radiobutton", undefined, "Prefer black and white");
radio1.value = true;
w.show ();
```



To determine which item in a radiobutton group is selected, you have to check all buttons until you hit on one whose value is true. If you have just two buttons, as in the example, that's easy:

```
if (radio1.value == true)
    // radio1 selected
else
    // radio2 selected
```

But radio buttons will typically be grouped together in a group or a panel, in which case you can cycle through the panel's children, which is an array:

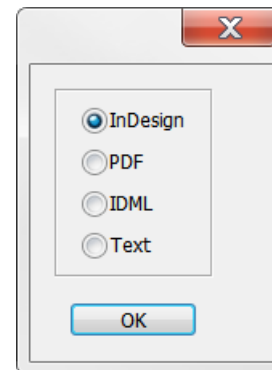
```
var w = new Window ("dialog");
var radio_group = w.add ("panel");
radio_group.alignChildren = "left";
radio_group.add ("radiobutton", undefined, "InDesign");
radio_group.add ("radiobutton", undefined, "PDF");
radio_group.add ("radiobutton", undefined, "IDML");
radio_group.add ("radiobutton", undefined, "Text");
w.add ("button", undefined, "OK");
// set dialog defaults
radio_group.children[0].value = true;

function selected_rbutton (rbuttons)
{
    for (var i = 0; i < rbuttons.children.length; i++)
        if (rbuttons.children[i].value == true)
            return rbuttons.children[i].text;
}

if (w.show () == 1)
    alert ("You picked " + selected_rbutton (radio_group));
```

It is wise to set a default so that the dialog always returns a valid choice. If you don't, you should take precautions against the possibility of returning an undefined object.

The example script returns the text of the selected button, but you could also return the button's index. In that case you could use that digit to pick an item from an array. For instance, to return a file extension rather than the button's text, you could replace the last four lines of the script with these:



```
    return i;
}

if (w.show () == 1)
    alert ("You picked " + ["indd", "pdf", "idml", "txt"][selected_rbutton (radio_group)]);
```

Now, if you select the first item, instead of returning **InDesign**, the script returns **indd**.

The scope of a group of radiobuttons is the group or panel in which they're defined. That means that if you want to use more than one group of radio buttons, you should place them in different groups and/or panels. An example is the [batch-convert](#) script, in which the radiobuttons at **From:** and **To:** are in separate groups.

### **Multiple groups act as one**

The scope of some radiobuttons is their container, usually a group or a panel. This means that all radiobuttons are either laid out as a column or as a row. To achieve a more flexible layout, you can create two groups, say, group A and group B, add radiobuttons to them, and add an event listener to each group so that if you click a button in A, all buttons in B are unmarked and the other way around.

The following script adds two panels to a window, and adds five radio buttons to each panel. The event listeners respond to mouse clicks. If you click something in panel1, any button in panel2 is unmarked; and when you click something in panel2, the marked button in panel1 is unmarked.

```

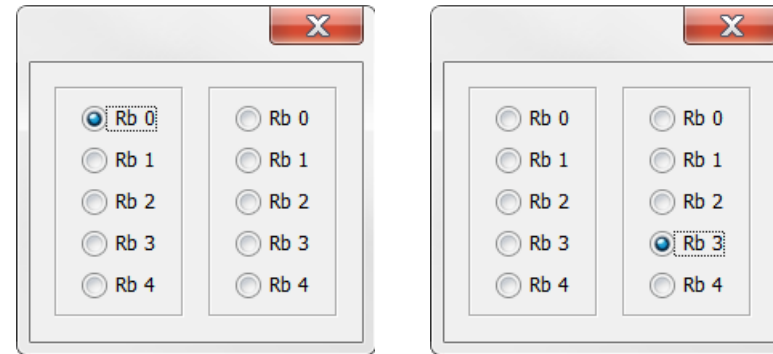
var w = new Window ("dialog");
w.orientation = "row";
var panel1 = w.add ("panel");
for (var i = 0; i < 5; i++) {panel1.add ("radiobutton", undefined, "Rb "+i);}
var panel2 = w.add ("panel");
for (var i = 0; i < 5; i++) {panel2.add ("radiobutton", undefined, "Rb "+i);}
panel1.children[0].value = true;

panel1.addEventListener ("click", function ()
{
for (var i = 0; i < panel2.children.length; i++)
panel2.children[i].value = false;
});

panel2.addEventListener ("click", function ()
{
for (var i = 0; i < panel1.children.length; i++)
panel1.children[i].value = false;
});

w.show();

```



You could combine the two panels in a group and define just one event listener for that group, but that just complicates the event listener and assumes some labels. We'll give that example in the section on labels.

## listbox

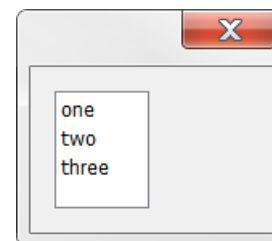
A listbox adds a list to a window. The list can be created and filled with items when the window is created, or the items can be added later. To create a list when the window is created, include it as an array. Here is an example:

```

var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"]);
w.show ();

```

To create a list later, or to add items to an existing list, use the method illustrated here:



```
var w = new Window ("dialog");
var myList = w.add ("listbox");
myList.add ("item", "one");
myList.add ("item", "two");
myList.add ("item", "three");
w.show ();
```

Select an item in the list by clicking it. By default, you can select just one item in a listbox. To enable multiple selection, include a creation property:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"], {multiselect: true});
w.show ();
```

With multiselection enabled, you select items in the usual way: Ctrl/Cmd+click adds individual items to a selection; Shift+click adds ranges.

To let the script select an item in the list when the window is displayed, say, the first item, add this line:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"], {multiselect: true});
myList.selection = 0;
w.show ();
```

In a multiselect list, to select two or more items, write the indexes of the items as an array:

```
myList.selection = [0,2];
```

This selects items 0 and 2. To select a number of consecutive items you need to list them all:

```
myList.selection = [0,1,2];
```

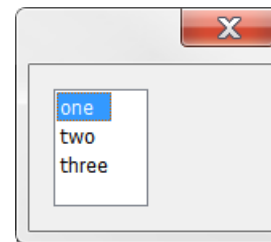
selects the first three items in myList.

**Note:** making selections in a list adds to any existing selection. For instance, these lines:

```
myList.selection = [0,1];
myList.selection = [2];
```

select three items in the list. To avoid adding to a list's existing selection, start with making the selection null:

```
myList.selection = null;
myList.selection = [2];
```



## Finding out which item is selected

In a single-select list, to determine which element was selected in a list, check the **selection** property of the list:

```
mySelection = myList.selection;
```

To make visible what we do in our example script, we'll use here another callback, **onChange**, which responds to changes to a window's control. We'll add a callback to our example script that monitors the listbox:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"]);
myList.onChange = function ()
{
    $.writeln (myList.selection)
}
w.show ();
```

Run the script, click, say "two", and the script will print **two** in the console. This looks like text, but when you try to test this with a line such as this one:

```
if (myList.selection == "two")
```

the result is **false**. The reason is that **myList.selection** is not text, but a **ListItem** object. Amend the script as follows:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"]);
myList.onChange = function () {$$.writeln (myList.selection.constructor.name)}
w.show ();
```

Run the script again and click an item; the script now prints **ListItem** in the console. To get the contents of the list item, query the object's **text** property:

```
if (myList.selection.text == "two")
```

Another useful property of list items is **index**, which – unsurprisingly – returns the item's index within the list:

```
if (myList.selection.index == 2)
```

**Note:** before processing a list item, you should always check if anything is selected in the list:

```
myList.onChange = function ()
{
    if (myList.selection != null)
        $.writeln (myList.selection.constructor.name);
}
```

This goes for the other types of list, too – dropdown and treeview, see below. (The example may look odd in that **onChange()** is triggered if you make a selection in a list, but there are other situations where you access a list and then it's necessary to check if any item is selected. It is therefore a good habit always to check the list's selection status.)

### Finding out which item is selected in multi-select lists

Selections in multi-select lists are a bit different in that they're arrays of list items. We'll amend slightly a previous script:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"], {multiselect: true});
myList.onChange = function (){$.writeln (myList.selection.constructor.name)}
w.show ();
```

Run the script, select any two items, and the script prints **Array** in the console. This is the case even if the selection consists of one item.

### Processing lists

Lists are arrays of ListItems. They are processed a bit differently than standard arrays. The following script processes a list simply by printing the text attribute of each item:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, ["one", "two", "three"]);
var b = w.add ("button", undefined, "Print");

b.onClick = function ()
{
    for (var i = 0; i < myList.items.length; i++)
        $.writeln (myList.items[i].text);
}

w.show ();
```

### Finding items in a list

To find an item in a list, use the **find** method:

```
var myItem = myList.find ("two");
```

This returns (a) an object of type **ListItem** if the item is found or (b) **null** if the item is not in the list.

### Using find() to make selections in a list

**find()** is a useful method to select items in a list because you can simply look for the list items' text:

```
var w = new Window ("dialog");  
var array = ["one", "two", "three", "four", "five"]  
var myList = w.add ("listbox", undefined, array, {multiselect: true});  
myList.selection = myList.find("two");  
myList.selection = myList.find("four");  
w.show ();
```

### Inserting items into a list

We saw earlier that items can be added to an existing list using the **.add** ("list") method. This always adds items at the end of the list. To add an item at a particular place, include the target index. For instance, to add an item at the beginning of a list, use this line:

```
myList.add ("item", "zero", 0);
```

To avoid creating duplicate entries in a list, you can use the **find** method to check if the item is already in the list:

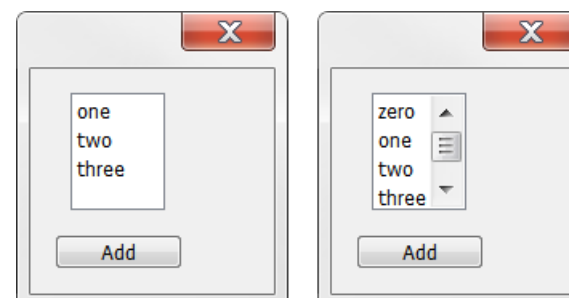
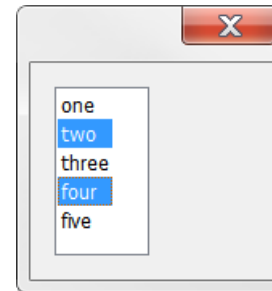
```
if (myList.find (myNewItem) != null)  
    myList.add ("item", myNewItem);
```

If you add an item to a list, the window is updated automatically, as shown by this script:

```
var w = new Window ("dialog");  
var myList = w.add ("listbox", undefined, ["one", "two", "three"]);  
var b = w.add ("button", undefined, "Add");  
b.onClick = function () {myList.add ("item", "zero", 0)}  
w.show ();
```

### Keeping a list sorted

Here is another example of list processing, this time inserting an item in a list and keeping the list in alphabetical order. The script activates the input prompt, so you can enter letters straight away. Notice that functions that process a window control need not necessarily be defined within the block that defines the window (i.e. between **new Window** and **w.show()**).



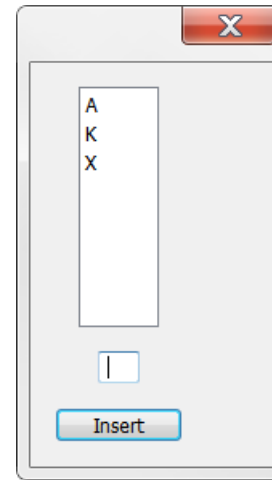


```

var w = new Window ("dialog");
var myList = w.add ("listbox", [0, 0, 50, 150], ["A", "K", "X"]);
var input = w.add ("edittext");
input.active = true;
var b = w.add ("button", undefined, "Insert", {name: "ok"});
b.onClick = function () {
    insert_item (myList, input.text);
    input.text = "";
    input.active=true;
}
w.show ();

function insert_item (list_obj, new_item)
{
    if (list_obj.find (new_item) == null)
    {
        var stop = list_obj.items.length;
        var i = 0;
        while (i < stop && new_item > list_obj.items[i].text)
            i++;
        list_obj.add ("item", new_item, i);
    }
}

```



The script's interface is a bit klunky, and as we named the Insert button **ok** it responds to the Enter key – triggering the onClick handler – so it sits there just catching Enter key presses. Later on we'll handle such situations more elegantly by defining an event handler rather than using a button for this purpose.

### Moving list items

To move items around in a list, we need two buttons: one to move the selected list item up, the other to move it down. We also need a function to swap two adjacent list items. Here is a simple example:

```

var w = new Window ("dialog", "Rearrange");
var list = w.add ("listbox", undefined, ["one", "two", "three", "four", "five"]);
list.selection = 1;
var up = w.add ("button", undefined, "Up");
var down = w.add ("button", undefined, "Down");

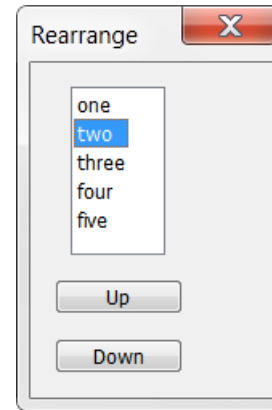
up.onClick = function ()
{
    var n = list.selection.index;
    if (n > 0)
    {
        swap (list.items [n-1], list.items [n]);
        list.selection = n-1;
    }
}

down.onClick = function ()
{
    var n = list.selection.index;
    if (n < list.items.length-1)
    {
        swap (list.items [n], list.items [n+1]);
        list.selection = n+1;
    }
}

function swap (x, y)
{
    var temp = x.text;
    x.text = y.text;
    y.text = temp;
}

w.show ();

```



Actually, the list items themselves remain where they are: it's their text properties that are swapped in the function `swap()`.

### Removing items from a list

To remove an item from a list, use the `.remove()` method. For example, to remove the third item from a list, use this:

```
myList.remove (myList.items[2]);
```

To remove an item by its name, you can use this method:

```
myList.remove (myList.find ("two"));
```

### Selecting vs. revealing items

If a list is longer than its box, by default the beginning of that list is displayed, as shown in screenshot (a). If the script preselects an item, the list scrolls to make that selection visible, see (b). If you want to make a certain item visible without selecting it, use **revealItem()**; in screenshot (c) an item is displayed (Line\_50) without selecting it. These three options are shown in the following script:

```
var w = new Window ("dialog");  
var myList = w.add ("listbox");  
for (var i = 0; i < 100; i++)  
    myList.add ("item", "Line_" + String (i))  
myList.preferredSize = [100,100];  
//~ myList.selection = 50; // screenshot (b)  
//~ myList.revealItem ("Line_50"); // screenshot (c)  
w.show ();
```

As the script stands it displays window (a); uncomment **myList.selection = 50;** and the script shows window (b); comment out that line again and uncomment **list.revealItem ("Item\_50");** to show window (c).

There is a fourth possibility, but it's just a cosmetic variant: if you reveal an item at the end of the list and then immediately reveal an earlier item, then that earlier item is shown at the beginning of the list box. For example, with these two lines:

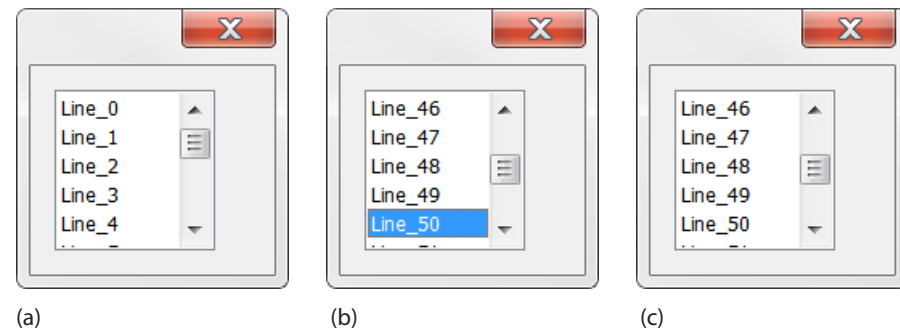
```
myList.revealItem (list.items.length-1);  
myList.revealItem ("Line_50");
```

the last item is selected (but you don't get to see it) and the item **Line\_50** is shown at the beginning of the box.

Like most list functions, **revealItem()** can be used not only with a list item's name, but also with a simple index:

```
list.revealItem (50);
```

Finally, **revealItem()** can be used to create a workaround for a display bug in multiselect lists. The bug is shown by the following script:



```

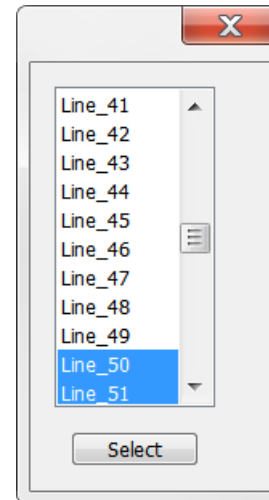
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, undefined, {multiselect: true});
for (var i = 0; i < 100; i++)
    myList.add ("item", "Line_" + String (i))
myList.preferredSize = [100,200];

var b = w.add ("button", undefined, "Select");

b.onClick = function ()
{
    myList.selection = [50, 51, 52, 53, 54];
}

w.show ();

```



The problem is clear. ScriptUI's default behaviour is to scroll a list so that a selected item is shown. But in multiselect lists in which more than two items are selected, only the first two items in the selection are shown. To remedy this and show all selected items, we do a **revealItem()** on the last item of the selection. If that's handled by a separate function then other processes can make use of that same function:

```

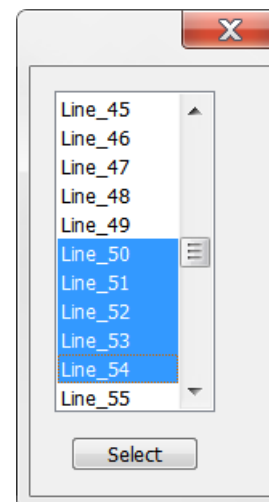
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, undefined, {multiselect: true});
for (var i = 0; i < 100; i++)
    myList.add ("item", "Line_" + String (i))
myList.preferredSize = [100,200];

var b = w.add ("button", undefined, "Select");
b.onClick = function () {myList.selection = [50,51,52,53,54];}
myList.onChange = ShiftList;

function ShiftList ()
{
    if (this.selection != null)
    {
        var idx = this.selection.pop().index;
        if (idx < this.items.length)
            this.revealItem (idx);
    }
}

w.show ();

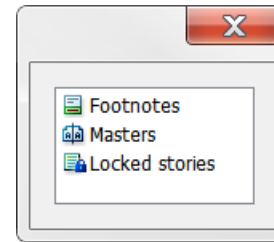
```



## Including images in a list

List items can include images; here is an example:

```
var descriptions = ["Footnotes", "Masters", "Locked stories"];
var imgs = ["footnotes.idrc", "masters.idrc", "locked_stories.idrc"];
var w = new Window ("dialog");
var myList = w.add ("listbox");
for (var i = 0; i < descriptions.length; i++)
{
    myList.add ("item", descriptions[i]);
    myList.items[i].image = File ("~/Desktop/" + imgs[i])
}
w.show ();
```

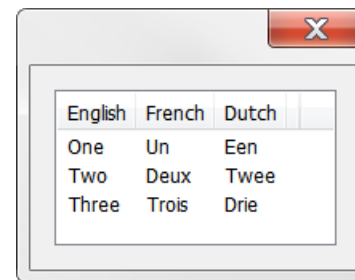


The first two lines create arrays of image names and list-item texts; the for-loop then adds list items and adds images to each item. (Like icons in icon buttons, images should be in PNG, IDRC, or JPG format.)

## Multi-column lists

Using multi-column lists you can create table-like structures, complete with headings. Here is an example:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, "",
    {numberOfColumns: 3, showHeaders: true,
    columnTitles: ["English", "French", "Dutch"]});
with (myList.add ("item", "One"))
{
    subItems[0].text = "Un";
    subItems[1].text = "Een";
}
with (myList.add ("item", "Two"))
{
    subItems[0].text = "Deux";
    subItems[1].text = "Twee";
}
with (myList.add ("item", "Three"))
{
    subItems[0].text = "Trois";
    subItems[1].text = "Drie";
}
w.show ();
```



The widths of the columns are determined automatically, but you can set them by adding the creation property **columnWidths**. Any text that doesn't fit the column is clipped, which is indicated by an ellipsis:

```
var w = new Window ("dialog");
var myList = w.add ("listbox", undefined, "",
    {numberOfColumns: 3, showHeaders: true,
    columnTitles: ["English", "French", "Dutch"],
    columnWidths: [30,30,100]});
```

Columns can be resized in the normal way: move the mouse cursor over a column separator in the header row (the cursor changes to  $\leftrightarrow$ ) and drag the column to the desired width.

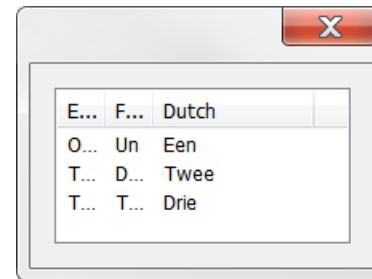
Images can be added to any of the items in any of the columns:

```
with (myList.add ("item", "One"))
{
    subItems[0].text = "Un";
    subItems[0].image = myFile_1;
    subItems[1].text = "Een";
    subItems[1].image = myFile_2;
}
```

For another application of lists, see the section on progressbars, below.

### Type-ahead lists: select while you type

A useful type of list is the type-ahead list. An example of this type is InDesign's Quick Apply panel. You see a list (or part of it) and a text-entry field. While you type in the entry field, the list is filtered. Here is the script:



```
picked = type_ahead ([ "bat", "bear", "beaver", "bee", "cat", "cats_and_dogs",
"dog", "maggot", "moose", "moth", "mouse"]);
```

```
function type_ahead (array)
{
  var w = new Window ("dialog", "Quick select");
  var entry = w.add ("edittext", [0, 0, 150, 22]);
  entry.active = true;
  var list = w.add ("listbox", [0, 0, 150, 220], array, {scrolling: true});
  list.selection = 0;

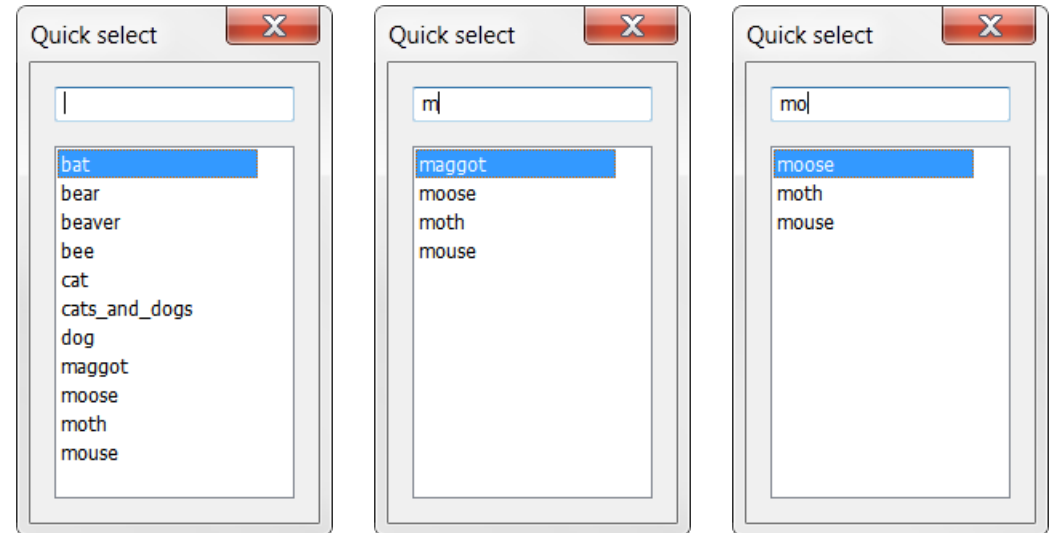
  entry.onChanging = function ()
  {
    var temp = this.text;
    list.removeAll ();
    for (var i = 0; i < array.length; i++)
      if (array[i].toLowerCase().indexOf (temp) == 0)
        list.add ("item", array[i]);
    if (list.items.length > 0)
      list.selection = 0;
  }

  entry.onChange = function () {w.close (1)}

  if (w.show () != 2)
    return list.selection.text;
  else
    w.close ();
}
```

We make use of the callback **onChanging**, which in this script monitors the entry field. Each time we enter something in the entry field, the callback function records what's there (`var temp = this.text`) and empties the list. It then builds a new list by matching `temp` against the array we used originally to display the list. If `temp` matches the beginning an array element, that element is added to the list. Finally, if the list contains any entries (it's empty if you type something that doesn't match array item), that item is selected.

Notice that in order to make this script work properly, that is, to let us enter text and press Return/Enter to return whatever is selected in the list without pressing any buttons, we could have added an OK button. But we don't need that: instead, we use another callback on the entry field, **onChange**, which kicks



in when we exit the field by pressing Enter/Return or Tab. This function sends 1 to **w.show()**, which closes the window and returns the list selection's text.

## dropdownlist

Dropdown lists are similar to listbox lists in many respects; the main differences, naturally, is that you can see one item at a time if the list is not selected and that you can select just one item at a time. Apart from that, they are processed in much the same way as list boxes. Here is an example:

```
var w = new Window ("dialog");
var myDropdown = w.add ("dropdownlist", undefined, ["one", "two", "three"]);
myDropdown.selection = 1;
w.show ();
```

Click the widget to expand the list, as shown in the second screenshot.

You can check which item is selected using the item's text property:

```
myChoice = myDropdown.selection.text;
```

You can also obtain the item's index:

```
myChoice = myDropdown.selection.index;
```

As with list boxes, in dropdown lists you can add images to list items:

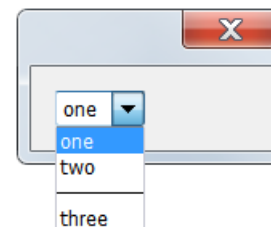
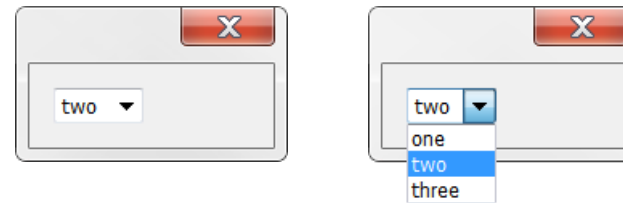
```
myDropdown.items[0].image = myImage
```

In many implementations of drop-lists, if you type a letter, the first item in the list that starts with that letter is selected in the lists's control without expanding the list (InDesign's scripted dialog system works like that, for instance). Unfortunately, ScriptUI's dropdown doesn't offer this, but that can be remedied with an event listener; see the script on p. 61.

## Separators

In dropdowns (but, strangely, not in listboxes) you can add separators to a dropdown. Here's an example:

```
var w = new Window ("dialog");
var myDropdown = w.add ("dropdownlist");
myDropdown.add ("item", "one");
myDropdown.add ("item", "two");
myDropdown.add ("separator");
myDropdown.add ("item", "three");
myDropdown.selection = 0;
w.show ();
```





The separator counts as a list item, so **myDropdown.items.length** returns 4; and if you want to preselect **three** in the above script, you'd use **myDropdown.selection = 3**, because using 2 would do nothing – separators can't be selected.

Separators can be added after creating a dropdown, too, using the add method and specifying an insertion point:

```
var w = new Window ("dialog");
var myDropDown = w.add ("dropdownlist", undefined, ["one", "two", "three"]);
myDropDown.add ("separator", undefined, 2)
myDropDown.selection = 0;
w.show ();
```

In this example the separator is added before the third item in the list. Note that you must use **undefined** as a dummy argument: the insertion point must be the third argument of the **add()** method.

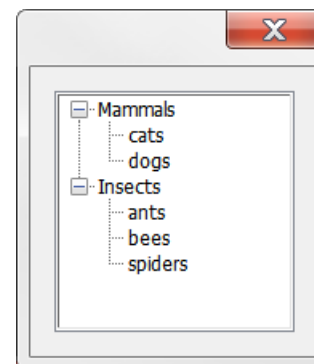
## treeview

Lists of type treeview create tree-like structures, much like, for instance, folder trees that you see in file managers. Here is an example:

```
var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 150]);
var mammals = myTree.add ("node", "Mammals");
mammals.add ("item", "cats");
mammals.add ("item", "dogs");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants");
insects.add ("item", "bees");
insects.add ("item", "spiders");
mammals.expanded = true;
insects.expanded = true;
w.show ();
```

Nodes are collapsed by default (they are distinguished from items by the + or – shown before them). To expand a node, double-click it or single-click the plus that precedes it. To expand any node when the window is drawn, use **myNode.expanded = true** as shown in the example. As far as I know, it's not possible to select an item when the tree is drawn.

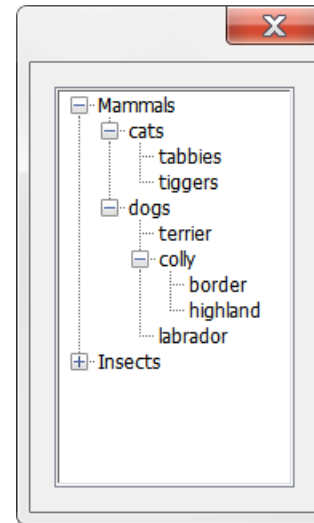
Nodes can be embedded under nodes to create multi-level trees. Here is an example:



```

var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 250]);
var mammals = myTree.add ("node", "Mammals");
mammals.cats = mammals.add ("node", "cats");
mammals.cats.add ("item", "tabbies");
mammals.cats.add ("item", "tiggers");
mammals.dogs = mammals.add ("node", "dogs");
mammals.dogs.add ("item", "terrier");
mammals.dogs.collies = mammals.dogs.add ("node", "colly");
mammals.dogs.collies.add ("item", "border");
mammals.dogs.collies.add ("item", "highland");
mammals.dogs.add ("item", "labrador");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants");
insects.add ("item", "bees");
insects.add ("item", "spiders");
w.show();

```



### Removing items and nodes from treeviews

Removing items from a treeview is similar to removing items from lists. If you remove a node, all its children are deleted as well, so you may want to add a test to prevent nodes from being deleted. In the following script a button is added to the dialog which calls a function that removes an item only if that item is not a node.

```

var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 100, 150]);
var mammals = myTree.add ("node", "Mammals");
mammals.add ("item", "cats");
mammals.add ("item", "dogs");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants");
insects.add ("item", "bees");
insects.add ("item", "spiders");
mammals.expanded = true;
insects.expanded = true;

var remove_btn = w.add ("button", undefined, "Remove item");

remove_btn.onClick = function (){
    if (myTree.selection.type != "node")
        myTree.remove (myTree.selection);
}
w.show ();

```

Another way of protecting nodes is to disable the delete button if a node is selected. So instead of the single function in the above script, you could have this code:

```

myTree.onChange = function ()
{
    if (myTree.selection.type == "node")
        remove_btn.enabled = false;
    else
        remove_btn.enabled = true;
}

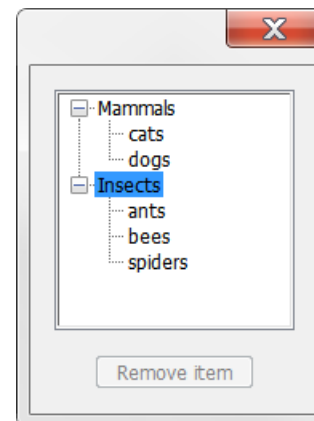
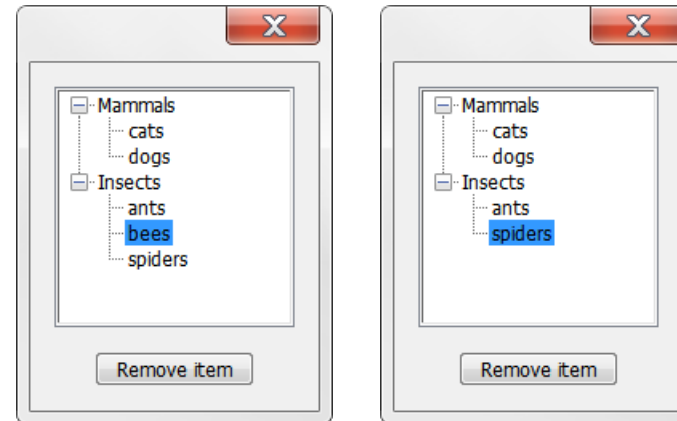
remove_btn.onClick = function (){myTree.remove (myTree.selection);}

```

As you can see in the screenshot, when you select a node in the tree, the **Remove item** button is disabled. There is therefore now no need to do any checks in the function that deletes the item.

### Adding items to a treeview

Adding items to a treeview is less straightforward than removing items. The trouble is that you can't use the index of items in the same way as in plain lists. The reason is that each node creates its own set of indexes. The indexes in our example tree are as follows:



<b>Mammals</b>	<b>0</b>
cats	0
dogs	1
<b>Insects</b>	<b>1</b>
ants	0
bees	1
spiders	2

Within the treeview, Mammals has index 0, Insects has index 1. Within Mammals, cats is 0; within Insects, ants is 0. To insert an item you must therefore address the correct parent node. Using the structure in our example, that can be done as follows:

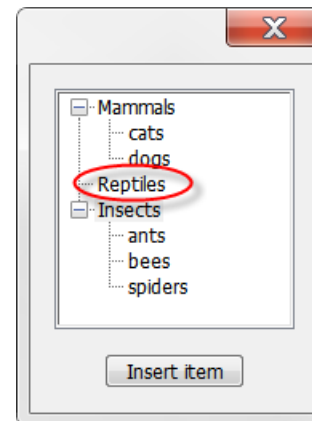
```
var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 150]);
var mammals = myTree.add ("node", "Mammals");
  mammals.add ("item", "cats");
  mammals.add ("item", "dogs");
var insects = myTree.add ("node", "Insects");
  insects.add ("item", "ants");
  insects.add ("item", "bees");
  insects.add ("item", "spiders");
mammals.expanded = true;
insects.expanded = true;

var insert_btn = w.add ("button", undefined, "Insert item");

insert_btn.onClick = function ()
{
  myTree.selection.parent.add ("item", "Reptiles", myTree.selection.index)
}

w.show ();
```

Elements are added within their branch. If you select a node, the added element is inserted at the level of that node but as an item, as shown in the screenshot next to the script code. To insert that element as a node, you need to check the current selection's type. The following context-sensitive function inserts an element of the correct type at each level:



```
insert_btn.onClick = function ()
{
    myTree.selection.parent.add (myTree.selection.type, "Reptiles", myTree.selection.
index)
}
```

### Expanding all nodes and their subnodes

In the scripts in the previous section, we expanded the two top-level nodes simply by using these two statements:

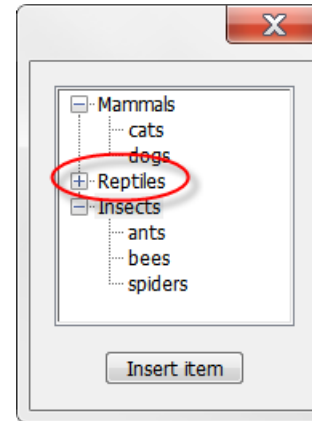
```
mammals.expanded = true;
insects.expanded = true;
```

This expands the whole tree because each top-level node contained just items, not any subnodes. However, that approach is not workable with trees with many nodes and subnodes. What we need is a method of expanding all nodes when the script starts.

Another limitation of treeview nodes is that you can expand them just one level. It's not possible, for instance, to double click a node (or Alt-click, or whatever) to expand that node and all its subnodes. These two things – expanding a whole tree when the dialog is first drawn and expanding nodes exhaustively when they are double-clicked – can be handled by one function which is called in two different ways: by an **onShow()** callback when the dialog is drawn and by an event listener when a node is double-clicked.

When the dialog is drawn, the script starts by collecting the first-level nodes (**myTree.children**) as defined in the **onShow()** callback. Each of the nodes is then recursively processed by the **expand\_node** function, which expands each node that it encounters. (Kasyan Servetsky noted that if trees are expanded using this method and the tree doesn't completely fit in the box, on Macs the top of the tree is displayed, on Windows, the last part.) The **false** parameter is needed so that we can use the function in the event listener as well.

The event listener monitors the tree for mouse clicks. If it detects a double click and if what was clicked on is a node, then that node is processed by **expand\_all**.



```

var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 250]);
var mammals = myTree.add ("node", "Mammals");
mammals.cats = mammals.add ("node", "cats");
mammals.cats.add ("item", "tabbies");
mammals.cats.add ("item", "tiggers");
mammals.dogs = mammals.add ("node", "dogs");
mammals.dogs.add ("item", "terrier");
mammals.dogs.collies = mammals.dogs.add ("node", "colly");
mammals.dogs.collies.add ("item", "border");
mammals.dogs.collies.add ("item", "highland");
mammals.dogs.add ("item", "labrador");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants");
insects.add ("item", "bees");
insects.add ("item", "spiders");

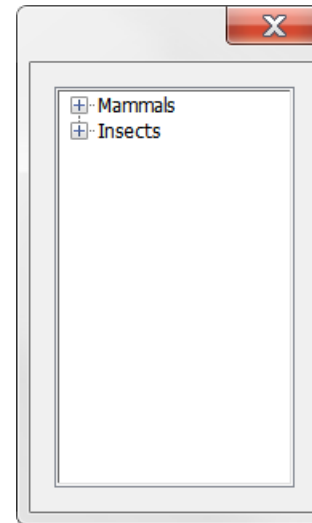
myTree.addEventListener("click", function (event)
{
    if (event.detail == 2 /*if double-click*/ && this.selection.type == "node")
        expand_node (this.selection, this.selection.expanded);
});

function expand_node (node, exp)
{
    node.expanded = false;
    if (!exp) node.expanded = true;
    var kids = node.items;
    for (var i = 0; i < kids.length; i++)
        if (kids[i].type == "node")
            expand_node (kids[i], exp);
}

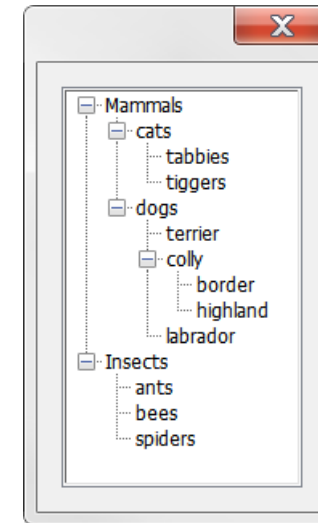
w.onShow = function () {
    for (var i = 0; i < myTree.children.length; i++)
        expand_node (myTree.children[i], false);
}

w.show ();

```



Without the onShow callback



With the onShow callback

The first two lines in the `expand_node` function may look strange:

```
node.expanded = false;  
if (!exp) node.expanded = true;
```

but that's the only way I could get the function to work.

### **Moving items and nodes: processing treeviews**

Moving items and nodes in a treeview isn't as straightforward as moving items in a listbox. We saw that in a listbox we don't really move an item, but rather simply exchange the text properties of the item to be moved and of that of an adjacent item. But in a treeview that's possible only if the selected thing and the adjacent one are both items or if one of them is a node and the other one an item. If however the selected thing and the adjacent one are both nodes, then we really have to move the node. The following script, which is the result of an exchange with Michel Pensas, who set the exchange in motion, illustrates moving things around in a treeview.

```

var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 250]);
var mammals = myTree.add ("node", "Mammals");
mammals.cats = mammals.add ("node", "cats");
mammals.cats.add ("item", "tabbies");
mammals.cats.add ("item", "tiggers");
mammals.dogs = mammals.add ("node", "dogs");
mammals.dogs.add ("item", "terrier");
mammals.dogs.collies = mammals.dogs.add ("node", "colly");
mammals.dogs.collies.add ("item", "border");
mammals.dogs.collies.add ("item", "highland");
mammals.dogs.add ("item", "labrador");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants");
insects.add ("item", "bees");
insects.add ("item", "spiders");

```

```

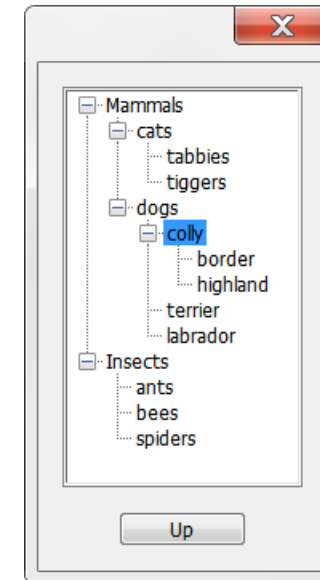
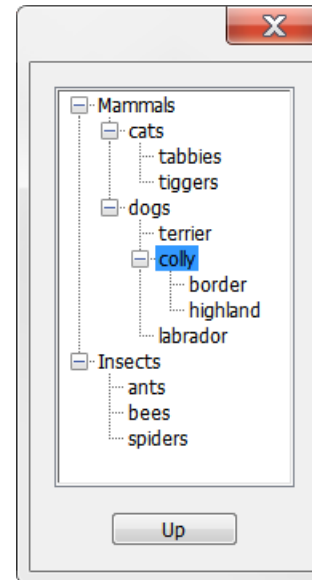
up = w.add ("button", undefined, "Up");
up.onClick = MoveUp;

```

```

function MoveUp ()
{
  if (myTree.selection.index > 0)
  {
    var sel = myTree.selection;
    var previous = sel.parent.items[sel.index-1]
    if (sel.type == "item" && previous.type == "item"){
      swap (sel, previous); myTree.selection = previous;
      return;
    }
    if (sel.type == "node" && previous.type == "item"){
      sel.parent.add ("item", previous.text, sel.index+1);
      myTree.remove (previous); // no need to select
      return;
    }
    if (sel.type == "item" && previous.type == "node"){
      myTree.selection = sel.parent.add ("item", sel.text, sel.index-1);
      myTree.remove (sel);
      return;
    }
  }
}

```





```

// When we get here we know that both items are nodes
var target = sel.parent.add ("node", sel.text, sel.index-1);
for (var i = 0; i < sel.items.length; i++)
    copy_branch (sel.items[i], target);
myTree.selection = target;
myTree.remove(sel);
} // if (myTree.
} // MoveUp

```

```

function copy_branch (N, Ncopy)
{
    var NewNode = Ncopy.add (N.type, N.text);
    if (N.type == "node")
    {
        var kids = N.items;
        for (var i = 0; i < kids.length; i++)
        {
            if (kids[i].type == "node")
                copy_branch (kids[i], NewNode);
            else
                NewNode.add ("item", kids[i].text);
        }
    }
}

```

```

function swap (x, y){
    var temp = x.text;
    x.text = y.text;
    y.text = temp;
}

```

```

w.show ();

```

The script moves items up, not down; moving down is just a slight variant. The MoeUp function checks the types of the selected thing and, if the selected thing's index is bigger than 0, in other words, if it isn't the first in the list, then it looks at the selected thing and the immediately preceding thing.

1. If the selection and what precedes it are both items, then the script simply swaps the text properties.
2. If the selection is a node and what precedes it is an item, we create a copy of the preceding item below the node and delete the original.

3. If the selection is an item and the thing above it is a node, then the script creates a copy of the item above the node and deletes the item.
4. And finally it gets interesting: the last logical case is that both the selection and what's above it are nodes. The script creates a copy of the selected node before the preceding node, then call the function **copy\_branch**, which copies all subnodes and items from the selected node to the copied node. When that's done, the selected node is deleted.

Note that in the MoveUp function the script always selects the copied item or node. This must be written into the script: it doesn't happen automatically. It's not really necessary, it's just convenient in case you want to continue moving the selected item.

### **Writing a treeview as XML**

It will be clear by now that any form of tree-processing will have to be done by recursive functions. The **expand\_all** and **move\_up** function shown earlier are examples. Another example would be to write out a treeview as an XML file. Here is an example – the panel on the right shows the script's output:

```

var w = new Window ("dialog");
var myTree = w.add ("treeview", [0, 0, 150, 250]);
var mammals = myTree.add ("node", "Mammals");
mammals.cats = mammals.add ("node", "cats");
mammals.cats.add ("item", "tabbies"); mammals.cats.add ("item", "tiggers");
mammals.dogs = mammals.add ("node", "dogs");
mammals.dogs.add ("item", "terrier");
mammals.dogs.collies = mammals.dogs.add ("node", "colly");
mammals.dogs.collies.add ("item", "border");
mammals.dogs.collies.add ("item", "highland");
mammals.dogs.add ("item", "labrador");
var insects = myTree.add ("node", "Insects");
insects.add ("item", "ants"); insects.add ("item", "bees"); insects.add ("item", "spiders");

xml = w.add ("button", undefined, "Write XML");
xml.onClick = exportXML;

function exportXML () {
$.writeln ('<?xml version="1.0" encoding="UTF-8" standalone="yes"?>\r<TreeView>');
for (var i = 0; i < myTree.children.length; i++)
writeXML (myTree.children[i], 1);
$.writeln ("</TreeView>");
}

function writeXML (node, level) {
$.writeln (indent (level), "<" + node.text + ">");
var kids = node.items;
for (var i = 0; i < kids.length; i++) {
if (kids[i].type == "node")
writeXML (kids[i], level+1);
else
$.writeln (indent (level+1), "<item>" + kids[i].text + "</item>");
} // for
$.writeln (indent (level), "</" + node.text + ">");
}

function indent (n) {
var s = ""; for (var i = 0; i < n; i++) {s += "\t";}
return s;
}

w.show ();

```

```

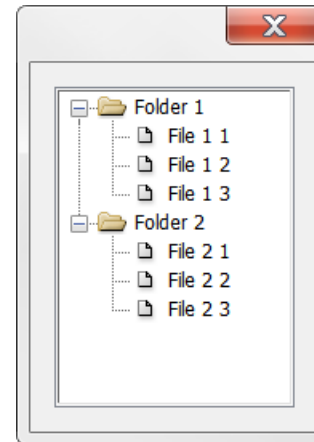
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<TreeView>
  <Mammals>
    <cats>
      <item>tabbies</item>
      <item>tiggers</item>
    </cats>
    <dogs>
      <item>terrier</item>
      <colly>
        <item>border</item>
        <item>highland</item>
      </colly>
      <item>labrador</item>
    </dogs>
  </Mammals>
  <Insects>
    <item>ants</item>
    <item>bees</item>
    <item>spiders</item>
  </Insects>
</TreeView>

```

## Images in treeviews

As in lists, you can add an image to nodes and items, as in the following script:

```
var w = new Window ("dialog");
var tree = w.add ("treeview", [0, 0, 150, 200]);
var folder_1 = tree.add ("node", "Folder 1");
folder_1.image = File ("/d/scriptui/folder_icon.idrc");
folder_1.add ("item", "File 1 1");
folder_1.items[0].image = File ("/d/scriptui/file_icon.idrc");
folder_1.add ("item", "File 1 2");
folder_1.items[1].image = File ("/d/scriptui/file_icon.idrc");
folder_1.add ("item", "File 1 3");
folder_1.items[2].image = File ("/d/scriptui/file_icon.idrc");
var folder_2 = tree.add ("node", "Folder 2");
folder_2.image = File ("/d/scriptui/folder_icon.idrc");
folder_2.add ("item", "File 2 1");
folder_2.add ("item", "File 2 2");
folder_2.add ("item", "File 2 3");
// another method to add the icons
for (var i = 0; i < folder_2.items.length; i++)
    folder_2.items[i].image = File ("/d/scriptui/file_icon.idrc");
folder_1.expanded = true;
folder_2.expanded = true;
w.show ();
```



Two examples of treeview controls are [Gabe Harbs's script](#) that shows based-on relationships between paragraph styles and the class picker in a [GREP editor](#) script.

## tabbedpanel

Tabbed panels are ScriptUI's third main container type. They are defined like groups and panels using the identifier **tabbedpanel**. You're familiar with them because InDesign uses several dialogs of this type. By way of example, the following script partially reproduces one of InDesign's tabbed-panel dialogs, namely, XML export. There's nothing you can do about the appearance of the borders of the tabs.

```

var w = new Window ("dialog", "Export XML", undefined, {closeButton: false});
w.alignChildren = "right";
var tpanel = w.add ("tabbedpanel");
tpanel.alignChildren = ["fill", "fill"];
tpanel.preferredSize = [350,300];
var general = tpanel.add ("tab", undefined, "General");
general.alignChildren = "fill";
var g_options = general.add ("panel", undefined, "Options");
g_options.alignChildren = "left";
g_options.dtd_decl = g_options.add ("checkbox", undefined, "Include DTD Declaration");
g_options.view_XML = g_options.add ("checkbox", undefined, "View XML Using: ");
g_options.export_sel = g_options.add ("checkbox", undefined, "Export From Selected Element");
g_options.export_untagged = g_options.add ("checkbox", undefined, "Export Untagged Tables as CALS XML");
g_options.remap = g_options.add ("checkbox", undefined, "Remap Break, Whitespace, and Special Characters");
g_options.xslt = g_options.add ("checkbox", undefined, "Apply XSLT: ");
g_options.add ("statictext", undefined, "Encoding: ");
var images = tpanel.add ("tab", undefined, "Images");
images.alignChildren = "fill";
var img_options = images.add ("panel", undefined, "Image Options");
var buttons = w.add ("group");
buttons.add ("button", undefined, "Export", {name: "ok"});
buttons.add ("button", undefined, "Cancel");
w.show ();

```

Tabs can be preselected just like items in a list. For example, the above script starts with the General tab selected; to open the Images tab on start-up, use this line:

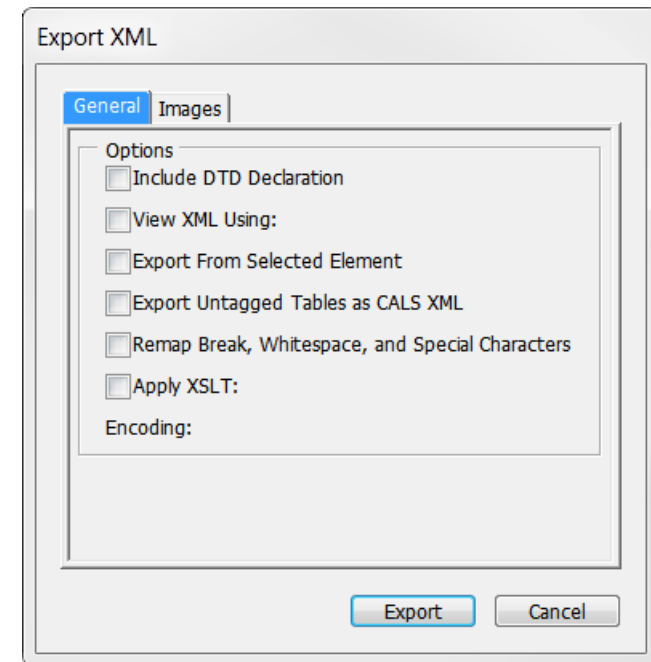
```
tpanel.selection = images;
```

## progressbar

The **progressbar** control, unsurprisingly, is used to display a progress bar so that the script's user gets an idea of how long a script will run. **progressbar** takes four parameters:

```
w.add ("progressbar", undefined, start, stop);
```

in which **start** and **stop** are the start and stop values of the bar itself, corresponding to the first and last items of whatever you're processing. The start value will usually be 0, while stop could be, for instance, the index of last array element if you're dealing with an array. Here is an example:



```

var list = ["one", "two", "three", "four", "five", "six"];
var w = new Window ("palette");
var progress = progress_bar (w, list.length);

for (var i = 0; i < list.length; i++)
{
    progress.value = i+1;
    // user functions
    $.sleep (400);
}
progress.parent.close();

function progress_bar (w, stop)
{
    var pbar = w.add ("progressbar", undefined, 1, stop);
    pbar.preferredSize = [300,20];
    w.show ();
    return pbar;
}

```

This simple example shows the basic use of the progress bar; there are more sophisticated ways of applying progress bars, of which Marc Autret's [example script](#) is an excellent example.

On a Mac you can create vertical scrollbars simply by making their width smaller than their height. Unfortunately, on PCs running Windows this isn't possible.

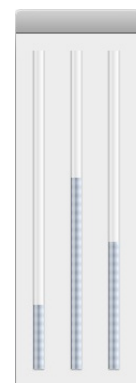
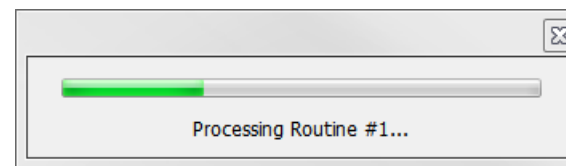
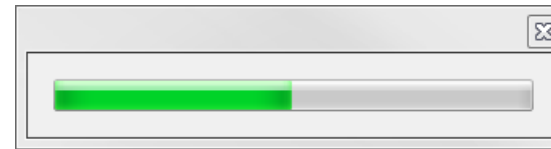
```

var w = new Window ("dialog");
w.orientation = "row";
pb1 = w.add ("progressbar", undefined, 0, 100);
pb2 = w.add ("progressbar", undefined, 0, 100);
pb3 = w.add ("progressbar", undefined, 0, 100);
pb1.preferredSize = pb2.preferredSize = pb3.preferredSize = [20, 300];
pb1.value = 20;
pb2.value = 60;
pb3.value = 40;
w.show();

```

### Lists as progress indicators

ScriptUI has a control **progressbar**, but using a list you can create a more informative kind of progress indication. For example, if you're processing several files, you can display the names of these files in a list, and use a highlight to show which file is being processed. Here is the script:



```

var list = ["one", "two", "three", "four", "five", "six"];
var hlights = highlight_list (list);

for (var i = 0; i < list.length; i++)
{
    hlights.children[0].selection = i;
    hlights.show ();
    // user functions
    $.sleep (400);
}
hlights.close();

function highlight_list (array)
{
    var w = new Window ("palette", undefined, undefined, {borderless: true});
    w.margins = [5,5,5,5];
    w.add ("listbox", undefined, array);
    return w;
}

```

The function **highlight\_list** initialises the window but doesn't show it yet. In the for-loop, we address list items by using **hlights.children[n]**, where **n** is the loop counter. In each iteration the window is shown using **show()** to show the change. (I don't know why it's necessary to do it like this, but it was the only way to make it work; using **layout()** doesn't seem to work here.)

A small change in the definition of the listbox makes for a slightly different appearance of the window:

```

w.add ("listbox", undefined, array, {multiselect: true});

```

By adding **{multiselect: true}** to the listbox definition, processed items remain highlighted.

## image

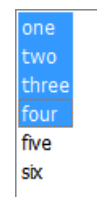
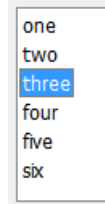
Image controls take a file object as their contents parameter. Here is an example:

```

var w = new Window ("dialog", "Bouquet");
var flowers = w.add ("image", undefined, File ("/d/scriptui/bouquet.jpg"));
w.show ();

```

It's not possible to position images absolutely (using **.location = [x,y]**), but they can be positioned with the alignment properties left, right, etc. Nor is it possible



to scale images just like that: they're always shown at their native size. Setting a smaller size merely crops the image:

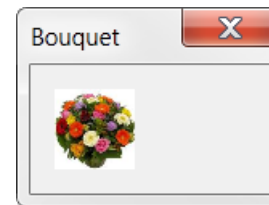
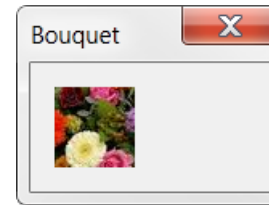
```
var w = new Window ("dialog", "Bouquet");
var flowers = w.add ("image", undefined, File ("/d/scriptui/bouquet.jpg"));
flowers.size = [50,50];
w.show ();
```

### Resizing images

I said "not just like that" because as Marc Autret points out, with a prototype extension of the **Image** object it is possible to resize images. Marc's brilliant extension is added at the beginning of the previous script:

```
Image.prototype.onDraw = function()
{ // written by Marc Autret
  // "this" is the container; "this.image" is the graphic
  if( !this.image ) return;
  var WH = this.size,
      wh = this.image.size,
      k = Math.min(WH[0]/wh[0], WH[1]/wh[1]),
      xy;
  // Resize proportionally:
  wh = [k*wh[0],k*wh[1]];
  // Center:
  xy = [ (WH[0]-wh[0])/2, (WH[1]-wh[1])/2 ];
  this.graphics.drawImage(this.image,xy[0],xy[1],wh[0],wh[1]);
  WH = wh = xy = null;
}

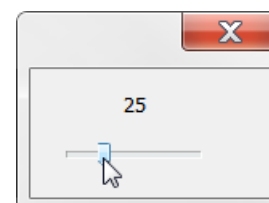
var w = new Window ("dialog", "Bouquet");
var flowers = w.add ("image", undefined, File ("/d/scriptui/bouquet.jpg"));
flowers.size = [50,50];
w.show ();
```



### slider

A slider is just that: the familiar slide bar with a control which you move with the mouse:

```
var w = new Window ("dialog");
var e = w.add ("edittext", undefined, 50);
var slider = w.add ("slider", undefined, 50, 0, 100);
slider.onChanging = function () {e.text = slider.value;}
w.show ();
```





The slide bar takes three numeric parameters: in the example, 0 and 100 are the minimum and maximum values, 50 is the value used when the window is drawn.

On Macs, but not on Windows, you can create a vertical slider simply by setting its width to a smaller value than its height:

```
var w = new Window ("dialog");
var slider = w.add ("slider", undefined, 0, 100);
slider.size = "width: 30, height: 300";
w.show ();
```

## flashplayer

Flashplayer controls are similar to image controls. And like images, if you set their size, you just get a crop or an oversized frame:

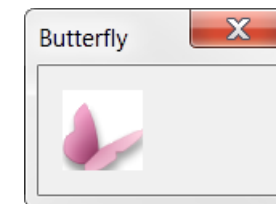
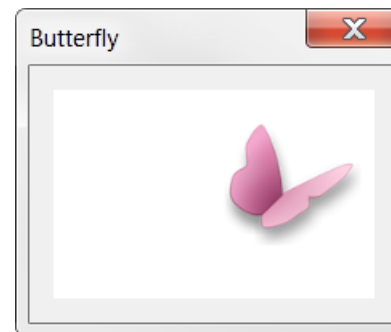
```
var w = new Window ("dialog", "Butterfly");
var flash = w.add ("flashplayer", undefined, File ("/d/scriptui/wave.swf"));
w.show ();
```

In CS3 there were controls for stopping and starting movies, but these were discontinued in CS4. You need ActionScript and Flash/Flex to regain any control over movie clips. See Loïc Aigon's post at <http://www.loicaigon.com/blog/?p=958> for an interesting discussion on the interaction of Flash, Flex, and ScriptUI.

The Object-Model Viewer in the ESTK is in fact a flashplayer control in a ScriptUI window. See the script 35omvUI.jsx, which (in CS5 on Windows) lives in Adobe/Adobe Utilities - CS5/ExtendScript Toolkit CS5/Required. This script is educational not only because of the flashplayer control used in it.

## Adding shortcut keys to controls

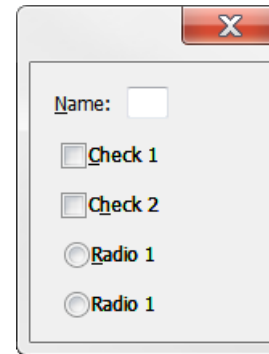
To select certain controls quickly or to move the cursor to a certain edit field, you can define shortcut keys for those controls. In Windows, those shortcuts are formed with the Alt key, on Macs, with the Cmd key. Here is an example with several shortcut keys:



```

var w = new Window ("dialog");
var grp = w.add("group");
var st = grp.add("statictext", undefined, "&Name:");
var txt = grp.add("edittext"); txt.shortcutKey = "n";
var c1 = w.add ("checkbox", undefined, "&Check 1"); c1.shortcutKey = "c";
var c2 = w.add ("checkbox", undefined, "C&heck 1"); c2.shortcutKey = "h";
var r1 = w.add ("radiobutton", undefined, "&Radio 1"); r1.shortcutKey = "r";
var r2 = w.add ("radiobutton", undefined, "R&adio 1"); r2.shortcutKey = "a";
w.show();

```



Naturally, to make it clear to the user that certain shortcut keys can be used, those letters should be cued. In ScriptUI you do that by placing an & before the letter that you want marked, which adds an underscore; see the screenshot. (Annoyingly, on Windows the underscores of most controls become visible only after pressing the Alt key. In InDesign and Illustrator, statictext is the exception; in PhotoShop, none of the underscores displays.)

In almost all cases, shortcut keys have the same effect as mouse clicks. For instance, pressing Alt/Cmd+n in the above script activates the editfield at Name, Alt/Cmd+c toggles the first checkbox, etc.

## Labelling controls

Controls can be labelled so that you can later identify them. This works much like using script labels on objects outside of ScriptUI. When you add a label to a control, you in fact simply add a text property to it.

We saw an example earlier which defined two event listeners on two panels with radio buttons so that it seemed as if those radio buttons were in one group. This still required two listeners. I mentioned there that these panels could be grouped together, in which case one event listener would suffice. This would be a more complex listener in that it should be able to tell which panel was clicked on. This is where labels come in; the following script illustrates:

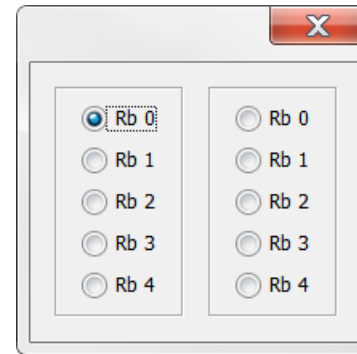
```

var w = new Window ("dialog");
var radiogroup = w.add ("group");
var panel1 = radiogroup.add ("panel"); panel1.label = "p1";
for (var i = 0; i < 5; i++) {panel1.add ("radiobutton", undefined, "Rb " + i);}
var panel2 = radiogroup.add ("panel"); panel2.label = "p2";
for (var i = 0; i < 5; i++) {panel2.add ("radiobutton", undefined, "Rb " + i);}
panel1.children[0].value = true;

radiogroup.addEventListener ("click", function (event)
{
if (event.target.parent.label == "p1")
{
for (var i = 0; i < panel2.children.length; i++)
panel2.children[i].value = false;
}
else
{
for (var i = 0; i < panel1.children.length; i++)
panel1.children[i].value = false;
}
} // if
);

w.show();

```



The two panels are labelled using a property **label**, but you can use any name you like, such as `panel1.id = "left"`. The event listener then checks the value of the label and acts according to it: if panel1 was clicked, panel2's buttons are disabled, if panel2 was clicked, panel1's children are unmarked.

Labels can be used on all types of control. For a special type of label – **name** – see the section **Communication between windows**, below.

## Size and position

The coordinates of windows can be set, as can the size and position of any element in a window. But you don't often need explicitly to instruct ScriptUI to position windows. The built-in layout manager does a good job, so that positioning is required just in a number of cases.

How you size and position windows and their elements is clearly described in the Tools Guide (see the section "Window Layout", present in all versions of the guide), so I won't go into it in much detail here. I will just point to one or two glitches you need to be aware of.

The property **maximumWidth** gives wrong results if you work on a dual-screen system. For example, I have two 24-inch 1920 × 1200 screens next to each other. The window property **maximumSize.height** correctly returns 1150 (1200 minus 50 system overhead for borders, probably), but **maximumSize.width** tricks me into believing that my window can be 3790 pixels wide, while that's really 1900 or thereabouts. So **width** considers both screens. To get around that you need to use **\$.screens**, which returns an array of objects representing screen coordinates. Note that this is part of the ESTK, not ScriptUI. The following script lists the coordinates of all screens:

```
for (var i = 0; i < $.screens.length; i++)  
{  
    $.writeln ("Screen " + i);  
    $.writeln ("top: " + $.screens[i].top);  
    $.writeln ("left: " + $.screens[i].left);  
    $.writeln ("bottom: " + $.screens[i].bottom);  
    $.writeln ("right: " + $.screens[i].right);  
}
```

Note that the values returned by the ESTK's **\$.screen** are not the same as those returned by ScriptUI's **maximumSize**.

To conclude, if you use a dual-screen setup, you can't rely on **maximumSize.width**.

## Resizing windows

Moving a window is easy: just grab the window's title bar and drag it to somewhere else on the screen. This is useful when the window covers what you were looking at. It can also be useful to make windows resizable, but that's a bit more complicated.

The script below shows a simple window which can be resized. It draws a window with an edit field and a group with three buttons in it. Resize the window in the usual way by clicking on a corner or a side of the window's frame and dragging it left, right, up, or down. The size of the group is fixed, that of the edit field is variable so that when you resize the window the edit field adjusts itself to the window's new size.

The first thing to do to make a window resizable is to include the creation property **{resizeable: true}**. In addition, the script needs the callback **onResizing**, which monitors whether the window is being resized; if it is, the window is redrawn.

```
Screen 0  
top: 0  
left: 0  
bottom: 1200  
right: 1920  
  
Screen 1  
top: 0  
left: 1920  
bottom: 1200  
right: 3840
```

```

w = new Window ("dialog", "Resize", undefined, {resizeable: true});
w.orientation = "row";

e = w.add ("edittext");
e.alignment = ["fill", "fill"];
e.minimumSize.width = 300;
e.minimumSize.height = 200;

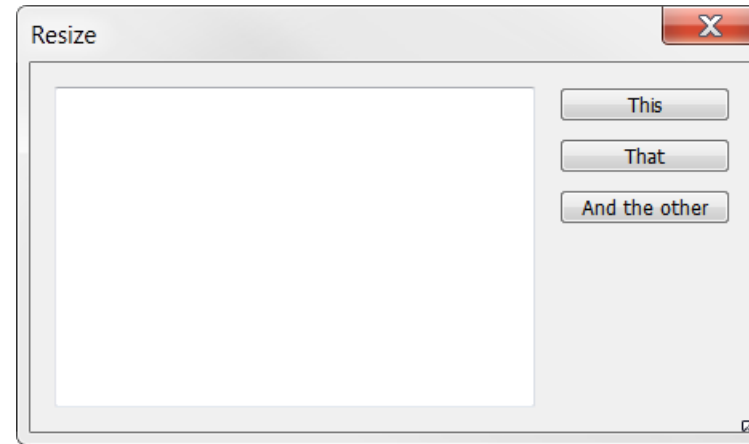
g = w.add ("group");
g.alignment = ["right", "top"];
g.orientation = "column";
g.alignChildren = "fill";

g.add ("button", undefined, "This");
g.add ("button", undefined, "That");
g.add ("button", undefined, "And the other");

w.onResizing = function () {this.layout.resize ();}
w.onShow = function ()
{
    w.layout.layout();
    w.minimumSize = w.preferredSize;
}

w.show ();

```



Finally, there are two vaguely mysterious commands in **onShow**. This callback is called just once, namely when the window is first drawn. In this function, **w.layout.layout()** forces the window to be laid out, so that (among other things) all sizes are calculated. The next line, **w.minimumSize = w.preferredSize**, sets the window's minimum size to the size it has when it is first drawn.

## Communication between windows

It's possible to communicate between windows, for example, to copy some data from one window to another. Naturally, this can be done only with palettes, or with some palettes and up to one dialog (because dialogs won't let you open any other windows). The two functions used for inter-window communication are **Window.find()** and **Window.findElement()**. And the relevant controls need to be labelled using the **name** property.

Here is an example. First run the following script, which opens a very simple window with just one edittext control and places some text in it:

```
#target indesign;
#targetengine "session";
var w1 = new Window("palette", "Window 1", undefined, {resizeable: true});
    var e1 = w1.add("edittext", undefined, "Some text", {name: "inputfield_1"});
    e1.characters = 30; e1.active = true;
w1.show();
```

Remember that in order to show a palette's title, the window's `resizeable` property needs to be set (on Windows, anyway). This is not strictly speaking necessary for our purposes here, but it's useful to see the window titles. Note that we label the `edittext` control by setting its `name` property to `inputfield_1` (this can be any text); we did this because we want to access that control later from another window.

Move the window out of the way a bit, then run the following script:

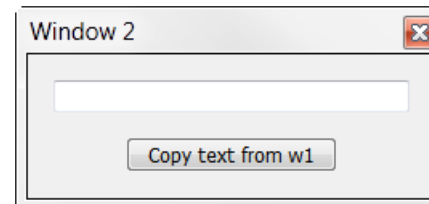
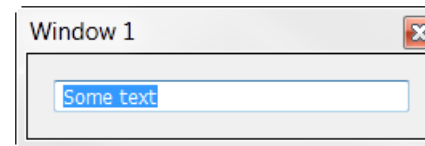
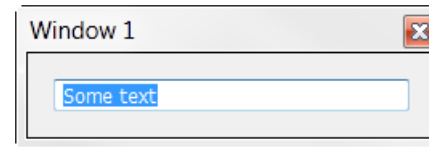
```
#target indesign;
#targetengine "session";
var w2 = new Window("palette", "Window 2", undefined, {resizeable: true});
    var e2 = w2.add("edittext"); e2.characters = 30;
    var copybutton = w2.add("button", undefined, "Copy text from w1");

    copybutton.onClick = function ()
    {
        var OtherW = Window.find ("palette", "Window 1");
        if (OtherW != null)
        {
            if (!OtherW.visible) {OtherW.show();}
            var w1_input = OtherW.findElement ("inputfield_1");
            if (w1_input != null)
                e2.text = w1_input.text;
        }
    }

w2.show();
```

The window produced by the first script is still visible. Now when you press **Copy text from w1**, the text from the Window 1 is copied to the `edittext` control in Window 2.

The `onClick` callback first tries to find the other window by using the **Window.find()** function, which takes two parameters: the window's type and title. This returns a window or `null` if the window can't be found. In order to access a window, it needn't be visible, but we'd like to see what's going on so we check if the window is visible; if it isn't, we'll show it. Next we try and locate



the edittext control in the found window, for which we use the `findElement()` function. ) This function, too, returns either a control or null.

## Fonts

The default type size used in ScriptUI windows is much too small for me, so I usually make that bigger. The typeface doesn't bother me (it's usually Tahoma or something similar), it's size that matters. The easiest way to set a control's type size is as follows:

```
var w = new Window ("dialog");
button1 = w.add ("button", undefined, "Default");
button2 = w.add ("button", undefined, "Bigger");
button2.graphics.font = "dialog:18";
w.show ();
```

This sets the text of the second button's type size to 18, using the window's default font (instead of dialog you can also use `palette` or `window`). To change the typeface as well, use the following:

```
button2.graphics.font = "Tahoma:18";
```

This construction does not, however, allow you to change the font style. You need the following construction to change the style to bold, for example:

```
button2.graphics.font = ScriptUI.newFont ("dialog", "Bold", 18);
```

This type of construction can be used to set the typeface as well:

```
button2.graphics.font = ScriptUI.newFont("Verdana", "Bold", 18);
```

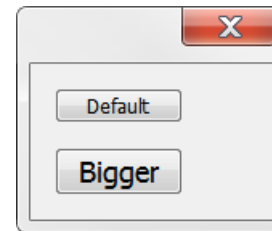
Both constructions can be used to change just the typeface:

```
button2.graphics.font = "Verdana";
button2.graphics.font = ScriptUI.newFont("Verdana");
```

**Note:** For the font name you must use the font's PostScript name, which is not necessarily the same as the menu name used in InDesign's or PhotoShop's interface. If setting a font throws an error, chances are that that font's PostScript name is not the same as its menu name. For example, the PostScript name of the Gill Sans family is GillSans. To find a font's PostScript name, run this one-line script in the ESTK with the Console visible:

```
app.fonts.item ("Gill Sans").postscriptName;
```

**Note:** ScriptUI recognises just four style names: Regular, Italic, Bold, and Bold-Italic. You cannot use a font that doesn't use any of these style names.



Instead of style names you can use numbers:

0	Regular	2	Italic
1	Bold	3	BoldItalic

Unfortunately, you can set fonts for one control at a time only. If you want to apply a font to all elements in a window or in a group or panel, you need to process that control. I use this function:

```
function set_font (control, font)
{
  for (var i = 0; i < control.children.length; i++)
  {
    if ("GroupPanel".indexOf (control.children[i].constructor.name) > -1)
      set_font (control.children[i], font);
    else
      control.children[i].graphics.font = font;
  }
}
```

You use it to apply a font to all elements in a window:

```
var w = new Window ("dialog");
var group1 = w.add ("group");
var button1 = group1.add ("button", undefined, "B1");
var button2 = group1.add ("button", undefined, "B2");
var group2 = w.add ("group");
var button1 = group2.add ("button", undefined, "B3");
var button2 = group2.add ("button", undefined, "B4");
set_font (w, "Tahoma:18");
w.show();
```

Or to just one group, as in this example:

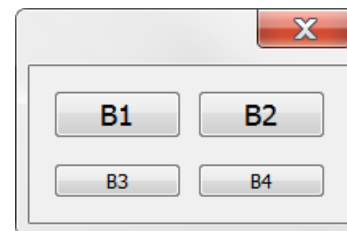
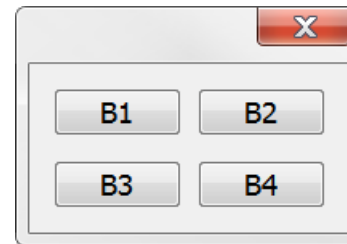
```
set_font (group1, "Tahoma:18");
```

**Note:** On Windows you can't change the appearance of a window's title.

## Colours

Colours, like fonts, are part of ScriptUI's graphics controls. But whereas fonts are quite well manageable, with colours, brushes, and other graphics features things start to get difficult. We're not greatly helped by the almost complete absence of any clear examples of how to use the various graphics elements. InDesign/the ESTK comes with two scripts that have examples of how to set the foreground and background colours, but that's about it.

The example below shows how to set font, style, size of controls, but also their foreground and background colours. The example was distilled from two sample scripts, ColorSelector.jsx and ColorPicker.jsx (to locate them, search your hard disk; their location differs depending on operating system and InDesign





version). These scripts are instructive, and also useful to find colour values.  
(Another good way of finding colour values is running Rapid ScriptUI; see the resource section, below, for details.)

```
var w = new Window ("dialog");
var s = w.add ("statictext", undefined, "Static");
var e = w.add ("edittext", undefined, "Edit");
var b = w.add ("button", undefined, "Button");
// The window's background
w.graphics.backgroundColor = w.graphics.newBrush (w.graphics.BrushType.SOLID_COLOR, [0.5, 0.0, 0.0]);
// Font and its colour for the first item, statictext
s.graphics.font = ScriptUI.newFont ("Helvetica", "Bold", 30);
s.graphics.foregroundColor = s.graphics.newPen (w.graphics.PenType.SOLID_COLOR, [0.7, 0.7, 0.7], 1);
// Font and colours for the second item, edittext
e.graphics.font = ScriptUI.newFont ("Letter Gothic Std", "Bold", 30);
e.graphics.foregroundColor = e.graphics.newPen (e.graphics.PenType.SOLID_COLOR, [1, 0, 0], 1);
e.graphics.backgroundColor = e.graphics.newBrush (e.graphics.BrushType.SOLID_COLOR, [0.5, 0.5, 0.5]);
// Font for the third control, a button. Can't set colours in buttons
b.graphics.font = ScriptUI.newFont ("Minion Pro", "Italic", 30);
w.show ();
```



The method that sets the background colours – **newBrush()** – takes two parameters: the type (SOLID\_COLOR; the other type, THEME\_COLOR, appears not to work if you target InDesign) and the colour as an array of three numbers between 0 and 1 (these are RGB colours). The method for setting the foreground colours here – **newPen()** – takes an additional parameter to set the line width, but as we're using it for applying a colour to a font, line width isn't relevant here (though it must be specified).

It appears to be impossible to set the colour of buttons. This has been discussed in Adobe's scripting forum, where Dirk Becker provided a work-around (see <http://forums.adobe.com/message/2335096#2335096>).

For a funny and educational application of fonts and colours, see **milligram's** take on [progress bars](#).

## Lines

Lines can be drawn in two ways. You can use ScriptUI's graphics object, which seems to me to be very complicated, but it's possible to use narrow panels to mimick horizontal and vertical lines. You can draw them at a specific point, as in this example:

```
var w = new Window ("dialog");
w.add ("panel", [0,0,200,3]);
w.add ("panel", [0,20,200,23]);
w.add ("panel", [100,0,103,50]);
w.show();
```

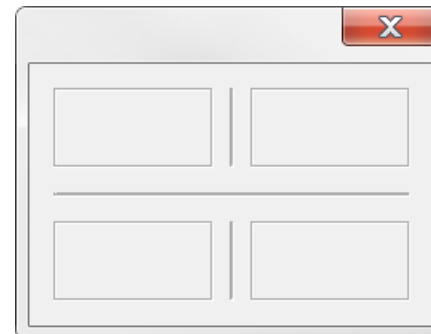
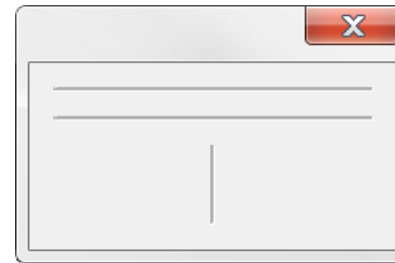
The first line, [0,0,200,3], sets a panel 200 pixels wide and 3 pixels high, so in effect it draws a line 3 pixels wide; the third line creates a 50-pixel tall and 3-pixel wide line. Narrow tall panels create vertical lines, shallow wide panels, horizontal ones.

Setting lines with absolute values has a disadvantage in that when you change the window, you almost always have to change the lines as well, and that can be finicky business. To avoid all that you can use ScriptUI's layout manager (always the preferred method): using the alignment attribute **fill**, lines can be made to resize with adjacent panels. Once set up, you have a flexible system. Here is a schematic example.

```
var w = new Window ("dialog");
w.alignChildren = ["fill","fill"];
var g1 = w.add ("group");
g1.alignChildren = ["fill","fill"];
var p1 = g1.add ("panel");
p1.preferredSize = [100, 50]; // Use [100,100] to get the second scr. shot
g1.separator = g1.add ("panel"); // This shows as a vertical line
// This is the line's width
g1.separator.minimumSize.width = g1.separator.maximumSize.width = 3;
var p2 = g1.add ("panel");
p2.preferredSize = [100, 50];
```

```
w.separator = w.add ("panel"); // This one shows as a horizontal line
// It says "height", but is again the line's width!
w.separator.minimumSize.height = w.separator.maximumSize.height = 3;
```

```
var g2 = w.add ("group");
g2.alignChildren = ["fill","fill"];
var p3 = g2.add ("panel");
p3.preferredSize = [100, 50]; // Use [200,50] to get the second scr. shot
g2.separator = g2.add ("panel"); // This shows as vertical a line
g2.separator.minimumSize.width = g2.separator.maximumSize.width = 3;
var p4 = g2.add ("panel");
p4.preferredSize = [100, 50];
w.show ();
```



Because the window and the two groups are set to alignment **fill**, when you change an element in a group the lines change accordingly. To see this, change the first bold **[100,50]** in the above script to **[100,100]**, and the second one to **[200,50]**, to get the result in the second screenshot.

(Note: the convoluted `w.separator.minimumSize.height = w.separator.maximumSize.height` is necessary because objects in ScriptUI don't have separate widths and heights that you can set. So we say that the lines must be at least and at most 3 pixels wide, which is to say exactly 3 pixels.)

## Callbacks

Callbacks are built-in methods that monitor events in a dialog: whether buttons are clicked, or a list item is selected, if an edit field is exited, etc. In the CS5 version of the Tools Guide they're listed on pp. 83 and 147. The most frequently used callback is probably **onClick**, which is illustrated in the following script:

```
var w = new Window ("dialog");
var b1 = w.add ("button", undefined, "Show this");
var b2 = w.add ("button", undefined, "Show that");

b1.onClick = function () {$.writeln (this.text + " clicked.");}
b2.onClick = function () {$.writeln (this.text + " clicked.");}

w.show ();
```

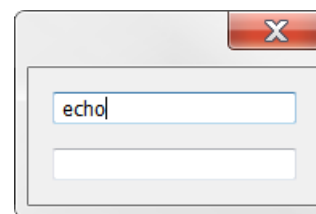
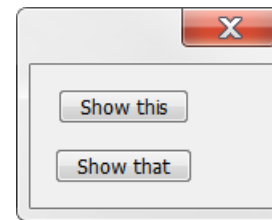
The script displays the dialog in the screenshot; press a button and it prints the name of the button in the console.

The body of the callback's function – which for the b1 button in this example is just `{alert (this.text + " clicked.")}` – can be a function of any complexity. The principle of the other callbacks is essentially the same.

Another frequent callback is **onChange**, which applies to several types of control. The first example shows how you can monitor an edit field.

```
var w = new Window ("dialog");
var e1 = w.add ("edittext");
var e2 = w.add ("edittext");
e1.active = true;
e1.characters = e2.characters = 20;
e1.onChange = function () {e2.text = e1.text}
w.show ();
```

The script displays a window with two empty edit fields. Type something in the first field; when you press Enter/Return or Tab, whatever you typed in the



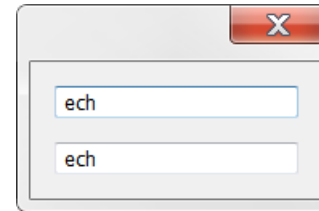
first field is (in this example) copied into the second one. Note that `onChange` is not triggered until you leave the `edittext` control. To monitor activity while something is entered, you need a different handler, **`onChanging`**:

```
var w = new Window ("dialog");
var e1 = w.add ("edittext");
var e2 = w.add ("edittext");
e1.active = true;
e1.characters = e2.characters = 20;
e1.onChanging = function () {e2.text = e1.text}
w.show ();
```

Now the second edit field is filled while you type.

Lists, too, can be monitored. The following script displays a three-item list, preselecting the first item. Click a list item and its name is printed in the console.

```
var w = new Window ("dialog");
var list = w.add ("listbox", undefined, ["one", "two", "three"]);
list.selection = 0;
list.onChange = function () {$$.writeln (this.selection.text + " selected.")}
w.show ();
```



## Event handlers

Event handlers are comparable to callbacks in that they monitor what happens in a dialog. They are more flexible, though with this added flexibility comes some complexity. Event handlers are discussed from p. 149 in the CS5 version of the Tools Guide. Two examples here for illustration: one that monitors the mouse, another that listens to the keyboard.

### Monitoring the mouse

The first example shows how to monitor specific mouse events and some environmental states:

```

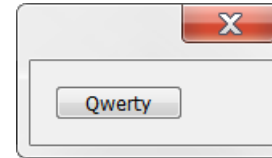
var w = new Window ("dialog");
var b = w.add ("button", undefined, "Qwerty");

b.addEventListener ("click", function (k) {whatsup (k)});

function whatsup (p)
{
  if (p.button == 2) {$.writeln ("Right-button clicked.")}
  if (p.altKey) {$.writeln ("Alt key pressed.")}
  $.writeln ("X: " + p.clientX);
  $.writeln ("Y: " + p.clientY);
}

w.show ();

```



The event handler monitors the mouse and the button and whenever you click the button, it executes the function defined in the handler. and can be seen as **onClick** with some more possibilities.

The four properties whose value the script prints in the console are just a selection; check the Tools Guide (p. 153) for a complete list. The example shows that you can check whether the right-button was clicked and whether the Alt key was pressed when you clicked. **clientX** and **clientY** return values that tell where on the control you clicked, so that you can tell, for example, whether you clicked the left or the right half of the button.

### Determining which button is pressed

If you have a group of buttons, you don't want to list a battery of onClick callbacks to find which button was pressed. Instead, you can define an event listener which monitors the group and if any of the buttons is pressed, returns some property of the button.

```

var w = new Window ("dialog");
var buttongroup = w.add ("group");
var panel1 = buttongroup.add ("panel", undefined, "Buttons");
    for (var i = 0; i < 5; i++)
        panel1.add ("button", undefined, "Button " + i);
var panel2 = buttongroup.add ("panel", undefined, "Knoppen");
    for (var i = 0; i < 5; i++)
        panel2.add ("button", undefined, "Button " + i);

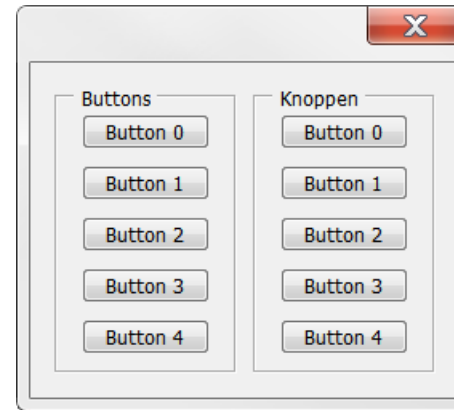
buttongroup.addEventListener('click', button_pressed);

function button_pressed (e)
{
    if (e.target.type == "button")
        $.writeln (e.target.text + " from panel " + e.target.parent.text);
}

w.show();

```

The type-check is necessary because you could have clicked the panel just outside a button. If you do that, `ev.target.type` would return `panel`, and the check allows you to ignore everything that's not a button.



## Listening to the keyboard

To listen to the keyboard, define an event listener using the keyboard event `keydown`. Here is an example that prints some properties of the keyboard event (this doesn't work properly when you target the ESTK):

```

var w = new Window ("dialog");
var edit = w.add ("edittext");
edit.active = true;
edit.characters = 30;
w.addEventListener ("keydown", function (kd) {pressed (kd)});

function pressed (k)
{
    $.writeln (k.keyName);
    $.writeln (k.keyIdentifier);
    $.writeln (k.shiftKey ? "Shift pressed" : "Shift not pressed");
    $.writeln (k.altKey ? "Alt pressed" : "Alt not pressed");
    $.writeln (k.ctrlKey ? "Ctrl pressed" : "Ctrl not pressed");
}

w.show ();

```

Keys have (among other things) a name (**A, B, Space, Minus, Shift**), an identifier (the hex value of the key in the form U+0000 or its name in the case of keys like Shift), and properties that return the state of the Shift, Ctrl, and Alt keys.

### Using the up and down arrow keys to change numerical data

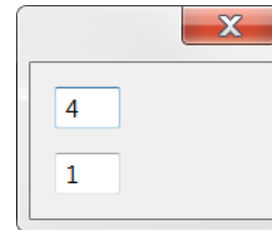
In another example we can do something about the paucity of input methods. The **edittext** control accepts just text, but with an event listener you can make this control behave a bit more like numerical input fields in which you can increment or decrement values by pressing the up and down arrows. Holding the shift key down while pressing an arrow key increases the step value by 10. Here is the script:

```
var w = new Window ("dialog");
var e1 = w.add ("edittext", undefined, "1");
var e2 = w.add ("edittext", undefined, "1");
e1.characters = e2.characters = 3; e1.active = true;

function handle_key (key, control)
{
    var step;
    key.shiftKey ? step = 10 : step = 1;
    switch (key.keyName)
    {
        case "Up": control.text = String(Number(control.text)+step); break;
        case "Down": control.text = String(Number(control.text)-step);
    }
} // handle_key

e1.addEventListener ("keydown", function (k) {handle_key (k, this);});
e2.addEventListener ("keydown", function (k) {handle_key (k, this);});

w.show();
```



The convoluted **String(Number(control.text)+incr)** is necessary because we can do arithmetic only with numbers while the edittext control accepts just text, so we'll need to convert between numbers and text all the time. Anyway, the function **handle\_key()** that's called by the event listener first checks if the Shift key is pressed; if it is, the step value is set to 10, else it's set to 1.

Measurement controls are just a slight complication of this. The following script adds measurement units to an input field. As you can see, it's now becoming a general JavaScript issue. The script handles both bare numbers and numbers followed by a measurement unit such as **mm** or **pt**.

```

var w = new Window ("dialog");
var e1 = w.add ("edittext", undefined, "1 mm");
var e2 = w.add ("edittext", undefined, "1 pt");

e1.characters = e2.characters = 5; e1.active = true;

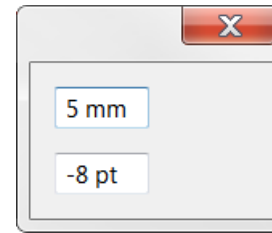
function handle_key (key, control) {
    var step;
    key.shiftKey ? step = 10 : step = 1;
    switch (key.keyName) {
        case "Up": control.text = update (control.text, step); break;
        case "Down": control.text = update (control.text, -step);
    }
} // handle_key

function update (str, incr) {
    try {
        var array = str.split(" ");
        var num = String (Number (array[0])+incr);
        if (array.length == 2) {num += " " + array[1];}
        return num;
    }
    catch (_) {alert ("Illegal input"); return str;}
} // update

e1.addEventListener ("keydown", function (k) {handle_key (k, this)});
e2.addEventListener ("keydown", function (k) {handle_key (k, this)});

w.show();

```



The script simply hard-wires the units mm and pt, it doesn't look at the document. Nor can you enter something like 4cm in the first field, to be displayed as 40 mm. But an example can be found in the [sidenotes](#) script, which includes a measurement input that mimics InDesign's measurement field in every respect.

### Selecting items in dropdowns using the keyboard

An example of a concrete application is the slight improvement of ScriptUI's **dropdown** control. In most drop-down lists, you can press a key to select an item in the dropdown that starts with that key's corresponding letter (type **t** and the first item starting with a **t** is displayed in the dropdown's control), but unfortunately that doesn't work in ScriptUI. The remedy is to attach an event



listener to the drop-down that monitors keystrokes and selects the first list item whose first letter matches the key press. Here is an example:

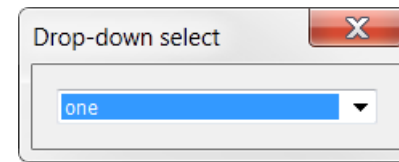
```
var numbers = ["one", "two", "three", "thirty", "hundred"];
var w = new Window ("dialog", "Drop-down select");
var ddown = w.add ("dropdownlist", undefined, numbers);
ddown.minimumSize.width = 200;
ddown.selection = 0; ddown.active = true;

ddown.addEventListener ("keydown", function (k)
{
    k = k.keyName.toLowerCase();
    var i = 0;
    while (i < numbers.length-1 && numbers[i].charAt(0).toLowerCase() != k)
        {++i;}
    if (numbers[i].charAt(0).toLowerCase() == k)
        ddown.selection = i;
})
);
w.show ();
```

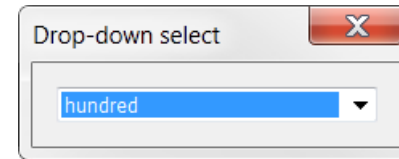
This mimics the behaviour of many dropdowns you encounter in InDesign but also, for instance, on the web. If you type **t**, **two** is displayed in the list; if you then type **h**, **hundred** is shown. In other words, any keypress matches just the first letter of an item.

But now that we're into event listeners we can do a bit better and mimic the behaviour of more clever dropdowns, such as that in the font dropdown in InDesign's Character panel. That list is like a type-ahead list, so that successive keypresses match the beginning characters of a list item. You can then type your way to an item, so to speak. Here is the script:

t >



h >



```

var numbers = ["one", "two", "three", "thirty", "hundred"];
var w = new Window ("dialog", "Drop-down select");
var ddown = w.add ("dropdownlist", undefined, numbers);
ddown.minimumSize.width = 200;
ddown.selection = 0; ddown.active = true;

var buffer = "";
ddown.onActivate = function () {buffer = ""}

ddown.addEventListener ("keydown", function (k)
{
    buffer += k.keyName.toLowerCase();
    var i = 0;
    while (i < numbers.length-1 && numbers[i].toLowerCase().indexOf (buffer) != 0)
        {++i;}
    if (numbers[i].toLowerCase().indexOf (buffer) == 0)
        ddown.selection = i;
    }
});

w.add ("button", undefined, "OK");
w.show ();

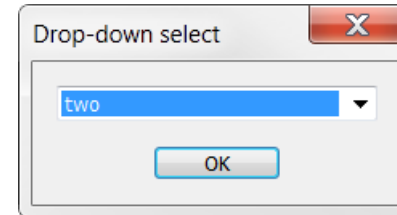
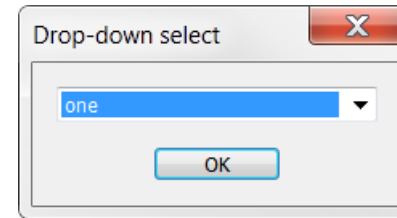
```

The script now remembers what we type in the variable called **buffer**. When the script starts, this variable is initialised to an empty string. The event listener adds our input to the buffer every time we press a key. Of course, when you move away from the dropdown (by pressing Tab or clicking somewhere else in the window) and then go back to the dropdown, you want to start afresh. That's what the onActivate callback is for: when the dropdown is activated, the buffer is emptied.

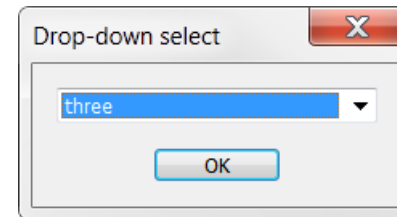
The dropdown's behaviour is now different. If you press **t**, **two** is highlighted as before. But when you now type **h**, the script selects **three** in the list, not **hundred** as before.

There's one problem, though: you can't use the backspace key to correct a typing error. That's because when you press any key, its name is appended to the buffer (except the Tab key). To correct an error, you need to move away from the dropdown, go back to it, and start again. We would therefore like to add something to the event listener that removes the buffer's last character if the Backspace key is pressed, and adds a key's name only if the key's name is a single letter. This last point is relevant because if you press the Shift key, *shift* is added to the buffer. Here is the revised script:

t >



h >



```

var array = ["one", "two", "three", "thirty", "hundred"];
var w = new Window ("dialog", "Drop-down select");
var ddown = w.add ("dropdownlist", undefined, array);
ddown.minimumSize.width = 200;
ddown.selection = 0; ddown.active = true;

var buffer = "";
ddown.onActivate = ddown.onDeactivate = function () {buffer = "";}

ddown.addEventListener ("keydown", function (k)
{
    if (k.keyName == "Backspace")
        buffer = buffer.replace (/.$/, "");
    else
        if (k.keyName.length > 0)
            buffer += k.keyName.toLowerCase();
    var i = 0;
    while (i < array.length-1 && array[i].toLowerCase().indexOf (buffer) != 0) {++i;}
    if (array[i].toLowerCase().indexOf (buffer) == 0)
        ddown.selection = i;
})
);
w.add ("button", undefined, "OK");
w.show ();

```

Note that we changed the callback, too, so that the buffer is reset on activation and on deactivation of the dropdown.

## Coding styles: resource string and code based

The coding style in the examples given so far is sometimes called code based. This is the style I use most of the time because I think it's the more convenient one. There are however two other, distinct, styles, and the choice between them appears to be informed mainly by taste.

### Resource string

The first alternative is the so-called resource string, in which the whole window is presented as a single string that defines the window's characteristics as an object. The script below is the last script recast using a resource string.

Proponents of this style make the point that using resource strings encourages the coder to separate the window's design from its functional component. This is clear in the example: the resource string states only how the window

looks, not what happens when you press a button or type something in a field. Whether this is a valid point is a matter of taste. A clear advantage, however, is that resource strings make for very compact code (though in this example that's not entirely clear).

A disadvantage of resource strings is that they can be very hard to debug if you make an error, mainly because the ESTK's error messages aren't particularly helpful. In addition, I find it easier to change a window's layout using the code-based style.

As mentioned earlier, which style you choose is determined mainly by taste. Here is our previous example using the resource-based style:

```
function myInput ()
{
  var winResource =
    "dialog {text: 'Form', \
      myInput: Group {\
        n: StaticText {text: 'Name:'},\
        myText: EditText {text: 'John', characters: 20, active: true}\
      },\
      myButtonGroup: Group {alignment: 'right'}\
        b1: Button {text: 'OK'},\
        b2: Button {text: 'Cancel'}\
      }\
    ";
  var myWindow = new Window (winResource);
  if (myWindow.show () == 1)
    return myWindow.myInput.myText.text;
  else
    exit ();
}
```

Since the resource string defines a complex object, you refer to any property as you would any JavaScript property, as in this line:

```
return myWindow.myInput.myText.text;
```

Note that capitalisation is slightly different: use **Button** and **StaticText**, not **button** and **statictext** – the names of controls and properties are case sensitive in different ways depending on the coding style.

## Code-based object

The second alternative, which I dub "object code" for lack of a better term, is in a way a mix of the two other styles: it doesn't use a resource code, but it does define the window as a complex object. This is illustrated in the following example, which is again the script on p. 6, with just the variable names abbreviated to keep things manageable. And this is the main reason why I don't use this style: it can get terribly verbose. An advantage of this style may be that you use just one variable, namely, the one to create the window.

```
function myInput ()
{
    var win = new Window ("dialog", "Form");
    win.inpGrp = win.add ("group");
    win.inpGrp.add ("statictext", undefined, "Name:");
    win.inpGrp.txt = win.inpGrp.add ("edittext", undefined, "John");
    win.inpGrp.txt.characters = 20;
    win.inpGrp.active = true;
    win.btnGrp = win.add ("group");
    win.btnGrp.alignment = "right";
    win.btnGrp.add ("button", undefined, "OK");
    win.btnGrp.add ("button", undefined, "Cancel");
    if (win.show () == 1)
        return win.inpGrp.txt.text;
    else
        exit ();
}
```

If you want to refer to very deeply embedded controls, you can set their name property and use **findElement()** to get a quick reference. For instance, if you change the edittext control in the above script as follows:

```
win.inpGrp.txt = win.inpGrp.add ("edittext", undefined, "John", {name: "personname"});
```

you can then get a quick reference to that control with this line:

```
var bloke = win.findElement ("personname");
```

## Mixing styles

The two styles can be mixed. The following example is still the same script, but this incarnation is code-based with a resource string thrown in:

```

function myInput ()
{
    var myWindow = new Window ("dialog", "Form");
    var myInputGroup = myWindow.add ("group");
    myInputGroup.add ("statictext", undefined, 'Name:');
    var myText = myInputGroup.add ("edittext {text: 'John', characters: 20, active: true}");
    win.btnGrp = win.add ("group");
    win.btnGrp.alignment = "right";
    win.btnGrp.add ("button", undefined, "OK");
    win.btnGrp.add ("button", undefined, "Cancel");
    if (myWindow.show () == 1)
        return myText.text;
    else
        exit ();
}

```

## Displaying properties and methods

The properties and methods associated with all controls are listed in the Tools Guide but the guide has not always been accurate, presumably because of changes to ScriptUI after the Guides had been finished. But for a convenient way to get a quick overview of which properties and methods are available for a control, you can use the two functions in the following script. The first few lines of the script define a simple dialog with just one edittext control. A call to **prop()** prints all properties and their current values, a call to **meth()**, a similar list for all methods (bold added).

```

var w = new Window ("dialog");
var e = w.add("edittext", undefined, "Cats");
prop(e);
meth(e);
//~ w.show ();

function prop (f)
{
$.writeln (f.reflect.name);
var props = f.reflect.properties;
var array = [];
for (var i = 0; i < props.length; i++)
    try {array.push (props[i].name + ": " + f[props[i].name])} catch (_){}
array.sort ();
$.writeln (array.join ("\r"));
}

function meth (m)
{
var props = m.reflect.methods.sort();
$.writeln ("\rMethods");
for (var i = 0; i < props.length; i++)
    $.writeln (props[i].name);
}

```

It's a simple list without any clarification. Nevertheless, I find it useful to print a quick overview of a control's properties (you can use the script to display properties and methods in the object models of all CS applications, not just SctiptUI).

Some of the properties are objects themselves, and these can be displayed, too. For example, change **prop(e)** in the third line of the script as follows to print a list of just the ScriptUIGraphics object:

```
prop(e.graphics);
```

## Resources

Virtually the only real comprehensive ScriptUI resource is the dedicated chapter in the Tools Guide that comes with the ESTK; you can find it in the ESTK's Help menu. This is a PDF file called **JavaScript Tools Guide CS5.pdf** (change CS5 to your version of the Creative Suite).

```

EditText
active: false
alignment: undefined
bounds: undefined
characters: undefined
children:
enabled: true
graphics: [object ScriptUIGraphics]
helpTip:
indent: undefined
justify: left
location: undefined
maximumSize: 3790,1150
minimumSize: 0,0
parent: [object Window]
preferredSize: 35,20
properties: undefined
shortcutKey: undefined
size: undefined
text: Cats
textselection:
type: edittext
visible: true
window: [object Window]
windowBounds: 0,0,100,30

Methods
addEventListener
dispatchEvent
hide
notify
removeEventListener
show

```

```

ScriptUIGraphics
BrushType: [object Object]
PenType: [object Object]
backgroundColor: undefined
currentPath: [object ScriptUIPath]
currentPoint: undefined
disabledBackgroundColor: undefined
disabledForegroundColor: undefined
font: Tahoma:12.0
foregroundColor: undefined

```

Using the ESTK's object-model viewer you can browse the ScriptUI object model. And Jongware's fabulous CS object browsers include a version for ScriptUI (see <http://www.jongware.com/idjshelp.html>).

Another source of information is the collection of sample scripts that comes with the ESTK, and which are listed on the first page of the ScriptUI chapter in the Tools Guide. To find these scripts, search your hard disk for a file with the name one of them (e.g. ColorPicker.jsx): their location depends on your operating system and CS version.

A more interesting collection of scripts are those that can be found in the ESTK's **Required** subdirectory. The scripts there form the basis of the ESTK's interface and use ScriptUI for their dialogs and other windows. This is a fascinating collection, with many instructive techniques. Do **not** on any account change these scripts. The location of the scripts depends on your OS and CS version. To find the folder, search your disk for a script called 35OMVui.jsx.

For help, go to Adobe's scripting forum ([http://forums.adobe.com/community/indesign/indesign\\_scripting](http://forums.adobe.com/community/indesign/indesign_scripting)), where there's always someone at hand to help with problems. There is also a dedicated ScriptUI forum at <http://forums.scriptui.com/>.

Apart from that (and the present text), information can be found in some blogs and forums, some of which I list below. [This list is very much in the making; if you know of any useful blogs and links, please let me know.]

## Blogs

The following blogs feature several items and script examples dealing with ScriptUI:

- Marc Autret's **Indiscript**: <http://www.indiscripts.com/>
- Marijan Tompa's **InDesign Snippets**: <http://indisnip.wordpress.com/>
- "milligram"'s collection at [http://www.milligramme.cc/wp/archives/category/script\\_tips/scriptui](http://www.milligramme.cc/wp/archives/category/script_tips/scriptui) (this site is in Japanese, a vaguely competent translator is provided)
- Loïc Aigon's **Scriptopedia** at <http://www.scriptopedia.org/> and his more personal <http://www.loicaigon.com/blog/> (both are in French and English and cover InDesign, Illustrator, PhotoShop, and Acrobat).

## Some useful forum topics

Some useful topics are floating around here and there, mostly in Adobe's scripting forum ([http://forums.adobe.com/community/indesign/indesign\\_](http://forums.adobe.com/community/indesign/indesign_)



scripting) In the list below I've grouped a number of ScriptUI topics dealt with in the forums.

#### **Change the colour of the background of buttons**

<http://forums.adobe.com/message/2335096#2335096>)

#### **Resize windows**

<http://forums.adobe.com/message/2280793#2280793>

<http://forums.adobe.com/message/2741942#2741942>

<http://forums.adobe.com/thread/858153?tstart=0>

#### **Icon buttons**

<http://forums.adobe.com/message/1111746#1111746>

<http://forums.adobe.com/message/2326630#2326630>

<http://forums.adobe.com/message/2899148#2899148>

#### **Scrollable panels**

<http://forums.adobe.com/message/2899148#2899148>

#### **Progress bar**

<http://forums.adobe.com/message/3152162#3152162>

<https://gist.github.com/966103>

### **Interactive dialog builders**

A completely different type of resource is provided by two interactive dialog builders: **Rapid ScriptUI** (<http://www.scriptui.com/>) and **ScriptUI Builder** (<http://www.scriptuibuilder.com/>; when I last checked in October 2010, the second one caused some panic in my browser). The first one, written by Steven Bryant, is updated from time to time; Steven is a regular contributor in Adobe's scripting forum and runs a forum dedicated to ScriptUI on his site.

Rapid ScriptUI comes in two versions: a free one and a professional version which costs \$39.95. The free version is useful only if you want some quick interface, but you won't be able to see the code. The professional version does let you inspect the code that's produced, and can in fact save you a lot of time doing the interface.

The two programs help you build interfaces, but, naturally, you need to write your own code to interpret and process the user's actions.

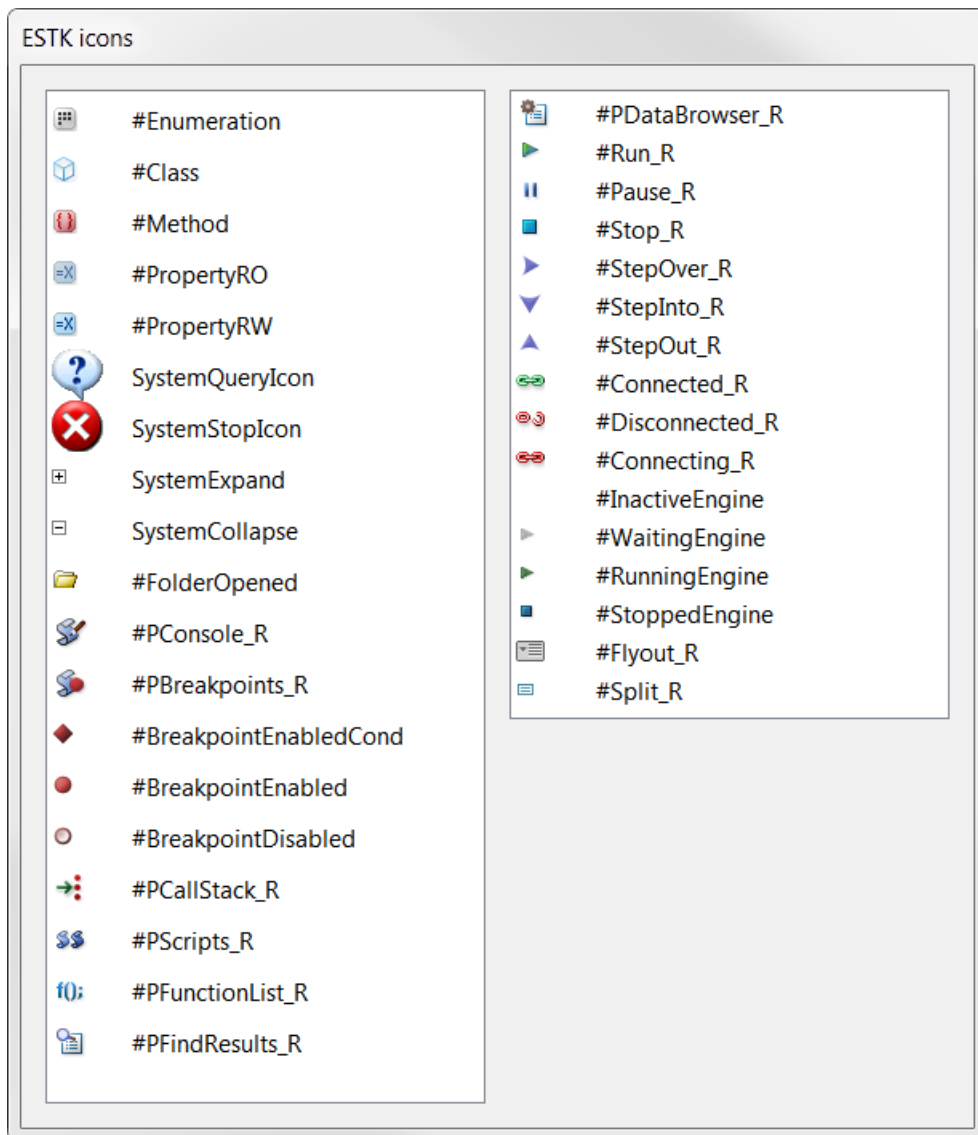
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## Appendix 1: ESTK resource icons

The screenshot shows the ESTK resource icons. They can be used only when a script targets the ESTK Toolkit. It is correct that some names have a # prefixed. Names that end in \_R have at least one more variant for different appearances. For instance, **#Pause\_R** will have incarnations **#Pause\_N** and **#Pause\_O**, which define different appearances of the same image. See section **State-sensitive iconbuttons** (p. 12) for details.



## Revision details

### 1.7

- Added a link to Loïc Aigon's post on the flashplayer control and the interaction between ScriptUI and Flash (p. 46).
- Added a subsection on separators to the section on dropdownlists (p. 29).
- Corrected several typos and small (inconsequential) errors.