

LibreOffice
The Document Foundation

Base Handbook

Chapter 4
Forms

Copyright

This document is Copyright © 2012–2013 by its contributors as listed below. You may distribute it and/or modify it under the terms of either the GNU General Public License (<http://www.gnu.org/licenses/gpl.html>), version 3 or later, or the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0/>), version 3.0 or later.

All trademarks within this guide belong to their legitimate owners.

Contributors

Robert Großkopf
Hazel Russman

Jost Lange
Jean Hollis Weber

Jochen Schiffers

Feedback

Please direct any comments or suggestions about this document to:
documentation@global.libreoffice.org.

Attention



Everything you send to a mailing list, included your email address and other personal data, which are written in the mail, is public archived and can not be deleted.

Acknowledgments

This chapter is based on an original German document and was translated by Hazel Russman.

Publication date and software version

Published 13 April 2013. Based on LibreOffice 3.5.

Note for Mac users

Some keystrokes and menu items are different on a Mac from those used in Windows and Linux. The table below gives some common substitutions for the instructions in this chapter. For a more detailed list, see the application Help.

Windows or Linux	Mac equivalent	Effect
Tools > Options menu selection	LibreOffice > Preferences	Access setup options
<i>Right-click</i>	<i>Control+click</i> and/or <i>right-click</i> depending on computer system	Open a context menu
<i>Ctrl (Control)</i>	⌘ (<i>Command</i>)	Used with other keys
<i>F5</i>	<i>Shift+⌘+F5</i>	Open the Navigator
<i>F11</i>	⌘+T	Open the Styles and Formatting window

Contents

Copyright	2
Contributors	2
Feedback	2
Acknowledgments	2
Publication date and software version	2
Note for Mac users	2
Forms make data entry easier	4
Creating forms	4
A simple form	4
Toolbars for form design	5
Setting up a form with the Form Navigator	5
Creating a form using a form field	7
Form properties	8
Properties of controls	11
Default settings for many controls	12
Text field	16
Numeric field	17
Date field	17
Time field	18
Currency field	19
Formatted field	19
List box	20
Combo box	24
Check box	26
Option button	27
Image control	27
Pattern field	28
Table control	29
Label field	30
Group box	31
Push button	33
Image button	34
Navigation bar	34
Multiple selection	36
A simple form completed	37
Adding groups of fields	37
Adjusting field proportions	38
Adding single fields	41
Table control	42
Main forms and subforms	45
One view – many forms	57

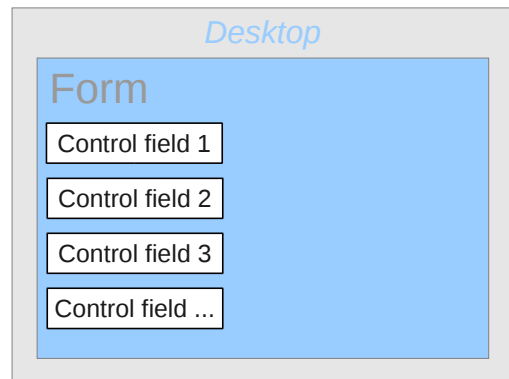
Forms make data entry easier

Forms are used when direct entry into a table is inconvenient, to pick up errors in data entry promptly, or when too many tables make direct management of data impossible.

Note

A *Form* in Base is a structure *invisible to the user*. It serves within Base to allow contact with the database.

What is *visible* to the user is the set of *Controls*, which serve for the entry or display of text, numbers, and so on. These controls are divided by the GUI into various types.



Creating forms

The simplest way to create a form is to use the Form Wizard. Use of the Wizard to create a form is described in Chapter 8, Getting Started with Base, in the *Getting Started with LibreOffice* guide. That chapter also explains how you can further modify the form after using the Wizard.

This handbook describes the creation of a form without using the Wizard. It also describes the properties of the various types of controls in a form.

A simple form

We start by using the task *Create Form in Design View* in the Forms area of the main Base window.



This calls up the Form Editor and the Form Shown in Design View window appears (Figure 1).

The Form Controls toolbar is docked on the left side. The Form Design toolbar (Figure 2) is docked at the bottom. If these toolbars do not appear automatically, use **View > Toolbars** to display them. Without these toolbars, it is not possible to create a form.

The blank area shows a grid of dots. This grid helps you to position the controls accurately, especially in relation to each other. The symbols at the right end of the Form Design toolbar show that the grid is visible and active.

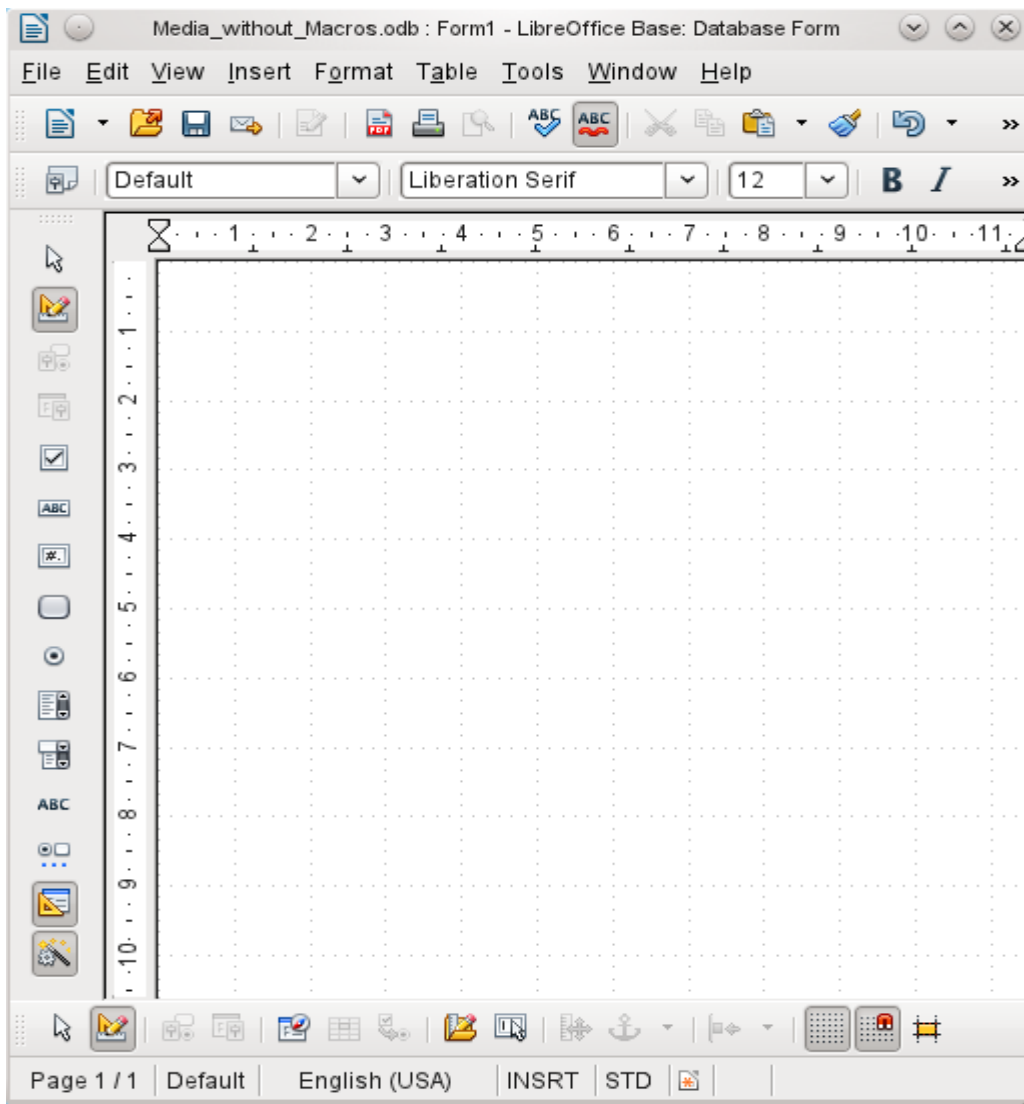


Figure 1: Form shown in Design View

Toolbars for form design

Now we will create a form on the empty page. This can be done in two ways:

- Invoke the Form Navigator to set up a form, or
- Design the form controls and set up the form by using the context menu.

Setting up a form with the Form Navigator

To display the Form Navigator, click the Form Navigator button (shown in Figure 2). A window appears (Figure 3); it shows only one folder, labeled **Forms**. This is the highest level of the area that we are editing. Several forms can be accommodated here.

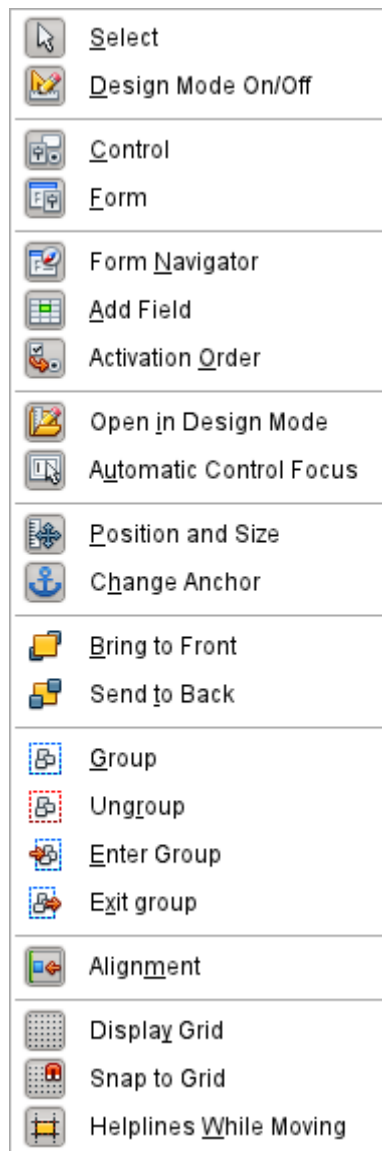


Figure 2: Available buttons on the Form Design toolbar

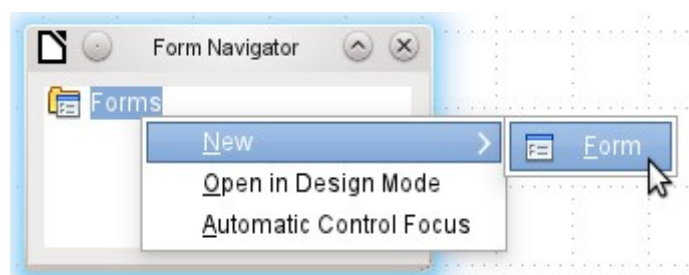
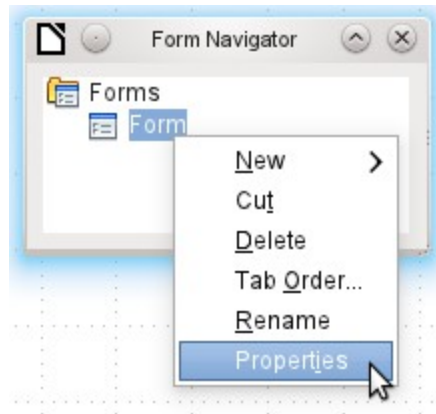


Figure 3: Using the Form Navigator to create a new form

In the Form Navigator (Figure 3), right-click on **Forms** to open a context menu. Choose **New > Form** to create a new form. The other choices in the context menu (**Open in Design Mode** and **Automatic Control Focus**) correspond to buttons in Figure 2; we will discuss them later.

The form carries the default name **Form**. You can change this name immediately or later. It has no significance unless you need to access some part of the form using macros. The only thing you need to ensure is that two elements with the same name do not occur on the same level in the folder tree.

The context menu of the form (shown below) provides the way to create form properties.



Creating a form using a form field

The Form Controls toolbar (Figure 4) makes available some fields for your form. The first four elements are identical to those of the Form Design toolbar; they are followed by commonly used form control types (a control consists of a field plus a label).

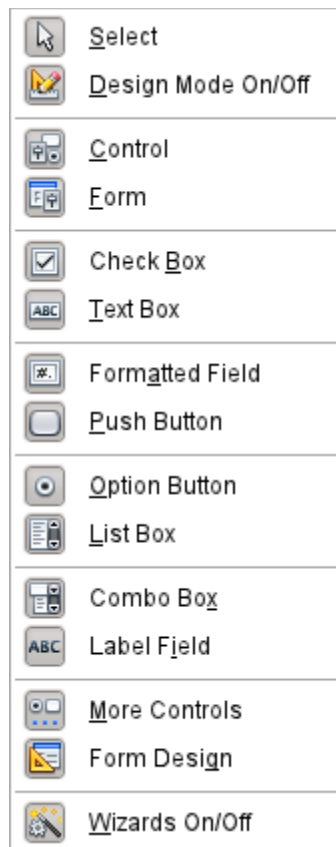


Figure 4: Available buttons on the Form Controls toolbar

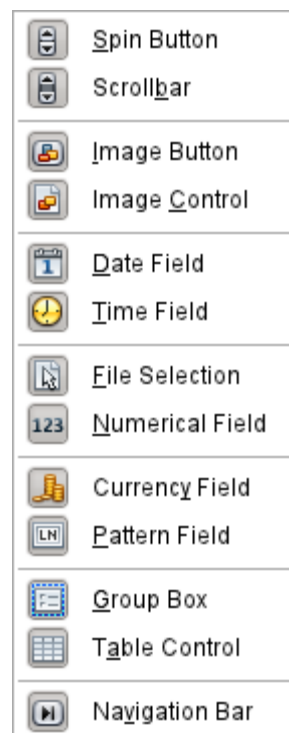


Figure 5: Available buttons on the More Controls toolbar

When you select a form control, you automatically create a form. For example, suppose you choose a text field: the cursor changes shape and a rectangular shape may be drawn on the white surface of the form. Then, on the stippled surface of the form, a text field appears.



Now you can create the form by right-clicking and using the **context menu** for the control (Figure 6).

Select the **Form** menu option (highlighted in the illustration) to set properties for the form you have just created. The form has the default name Form.

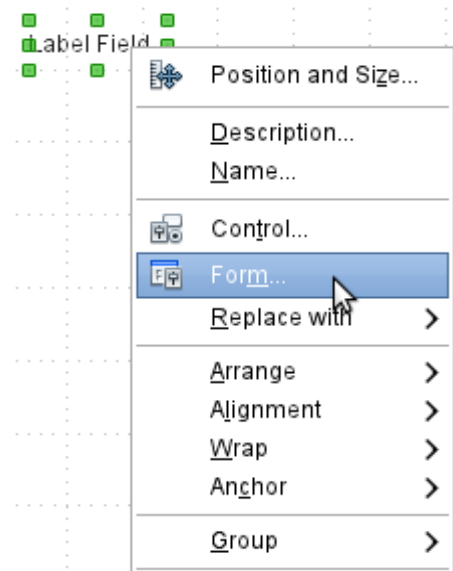


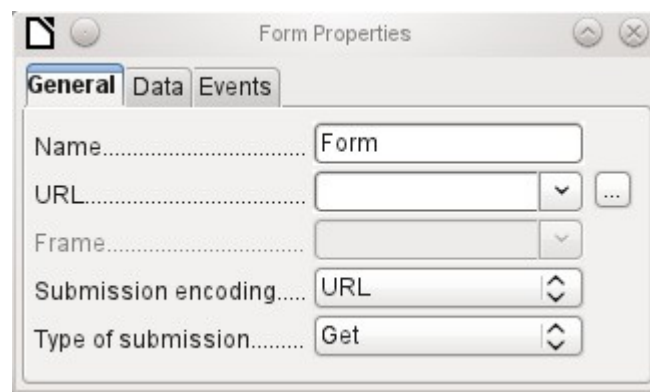
Figure 6: Context menu for form

Form properties

When the form properties are called up using the context menu in the Form Navigator or the context menu of a form control, a Form Properties window appears. It has three tabs: **General**, **Data** and **Events**.

General tab

Here you can change the Name of the form. In addition there are design possibilities that have no significance inside Base. They show only the more general possibilities for design using a form editor; when you create a Web form you will need to use them.



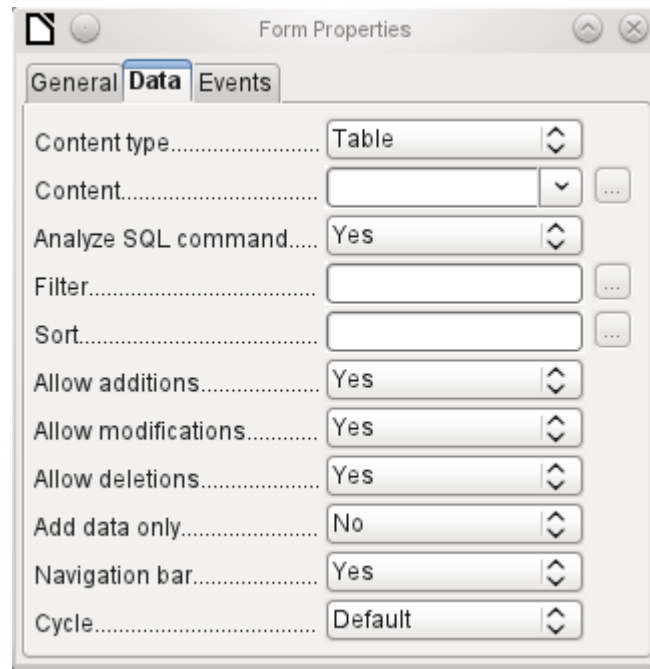
URL: Destination for the data.

Frame: Section of the destination website to be addressed where necessary.

Submission encoding: in addition to the normal character encoding for transmission to the URL, you can specify here text encoding and multipart coding (for example, for transfer of data).

Type of submission: GET (visible via the URL attached to the filename; you can see this often in the web if you use a search engine) or POST (not visible; suitable for large data volumes).

Data tab



For creating internal forms in Base, this is the most important tab. Here you can set the following initial properties for the form:

Content type: Choose between *Table*, *Query* and *SQL command*. While *Table* can always be used for data entry into a form, this is not always the case for *Query* (for more information, see Chapter 5, *Queries*, in this book) or direct entry of a *SQL command*. Here we are dealing with a query that is not visible in Base's query container but has in principle the same structure.

Content: According to whether *Table* or *Query* was chosen above, all *available tables and queries* are listed. If a *SQL command* is to be created, you can invoke the *Query Editor* by using the button with the three dots to the right of the *Content* field.

Analyze SQL command: If the analysis of *SQL commands* should not be permitted (because, for example, you are using code that the GUI cannot show correctly), you should choose **No** here. However this will prevent the form accessing the underlying data using a filter or a sort.

Filter: Here you can set a filter. To get help with this, click the button to the right of the field. See also Chapter 3, *Tables*, in this book.

Sort: Here you can set up a *Sort* for your data. To get help, click the button to the right of the field. See also Chapter 3, *Tables*.

Allow additions: Should the entry of new data be allowed? By default this is set to **Yes**.

Allow modifications: Should editing of the data be allowed? By default also **Yes**.

Allow deletions: The deletion of data is also allowed by default.

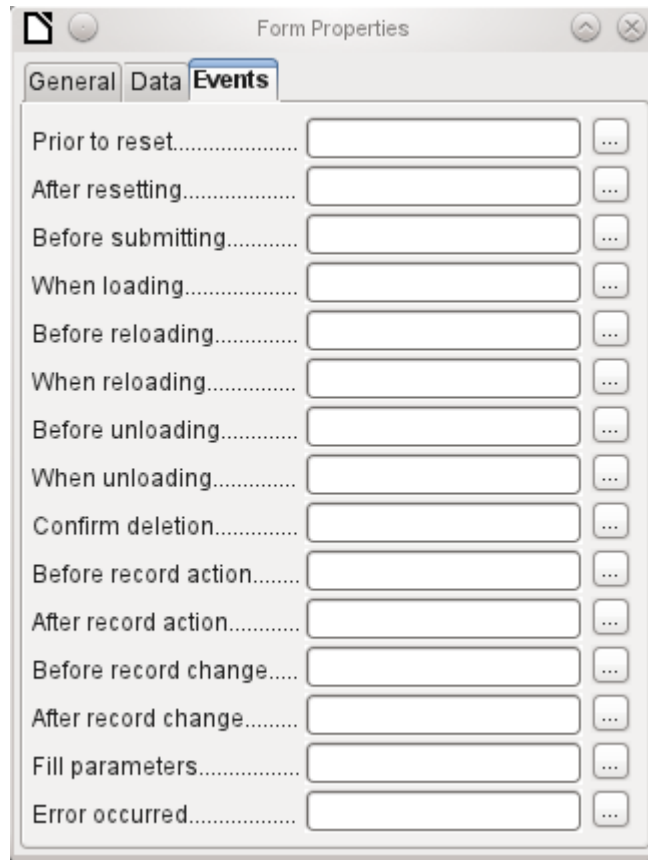
Add data only: If you choose this option, an empty form will always be displayed. There will be no access to existing data, which can neither be edited nor viewed.

Navigation bar: The appearance of the *Navigation Bar* at the bottom of the screen can be switched on or off. There is also a possibility, when you have a subform, always to show the *Navigation Bar* for the main form, so that activation of this toolbar affects the main form only. This setting for the *Navigation Bar* is not relevant to the internal navigation toolbar that can be added as a form control if required.

Cycle: The *Default* option for Base databases is that after entry into the last field in a form, the *Tab* key takes you to the first field of the next record – that is, a new record will be created. For

databases, this has the same effect as *All records*. By contrast, if you choose *Active record*, the cursor will move only within the record; when it reaches the last field, it will jump back to the first field in that record. *Current page* refers particularly to HTML Forms. The cursor jumps from the end of a form to the next form on that page further down.

Events tab



Events can trigger macros. A click on the button on the right (...) allows macros to be linked to the event.

Reset: The form is emptied of all new entries that have not yet been saved.

Before submitting: Before the form data are sent. This is only meaningful for Web forms.

When loading: Only when opening the form. Not when loading a new record into the form.

Reloading: This takes place when the content of the form is refreshed, for example by using a button on the Navigation Bar.

Unloading: This option seems not to function. It would be expected to refer to the closing of the form.

Record action: This includes, for example, storage using a button. In tests, this action regularly duplicates itself; macros run twice in succession.

Record change: The opening of a form counts as a record change. Whenever one record changes to another within the form, this action likewise occurs twice. Macros are therefore run twice in succession.

Fill parameters: This macro will be run if a parameter query is to be invoked in a subform, but for some reason the parameter is not correctly transmitted from the main form. If this event is not caught, a parameter query will follow the loading of the form.

Error occurred: This event could not be reconstructed.

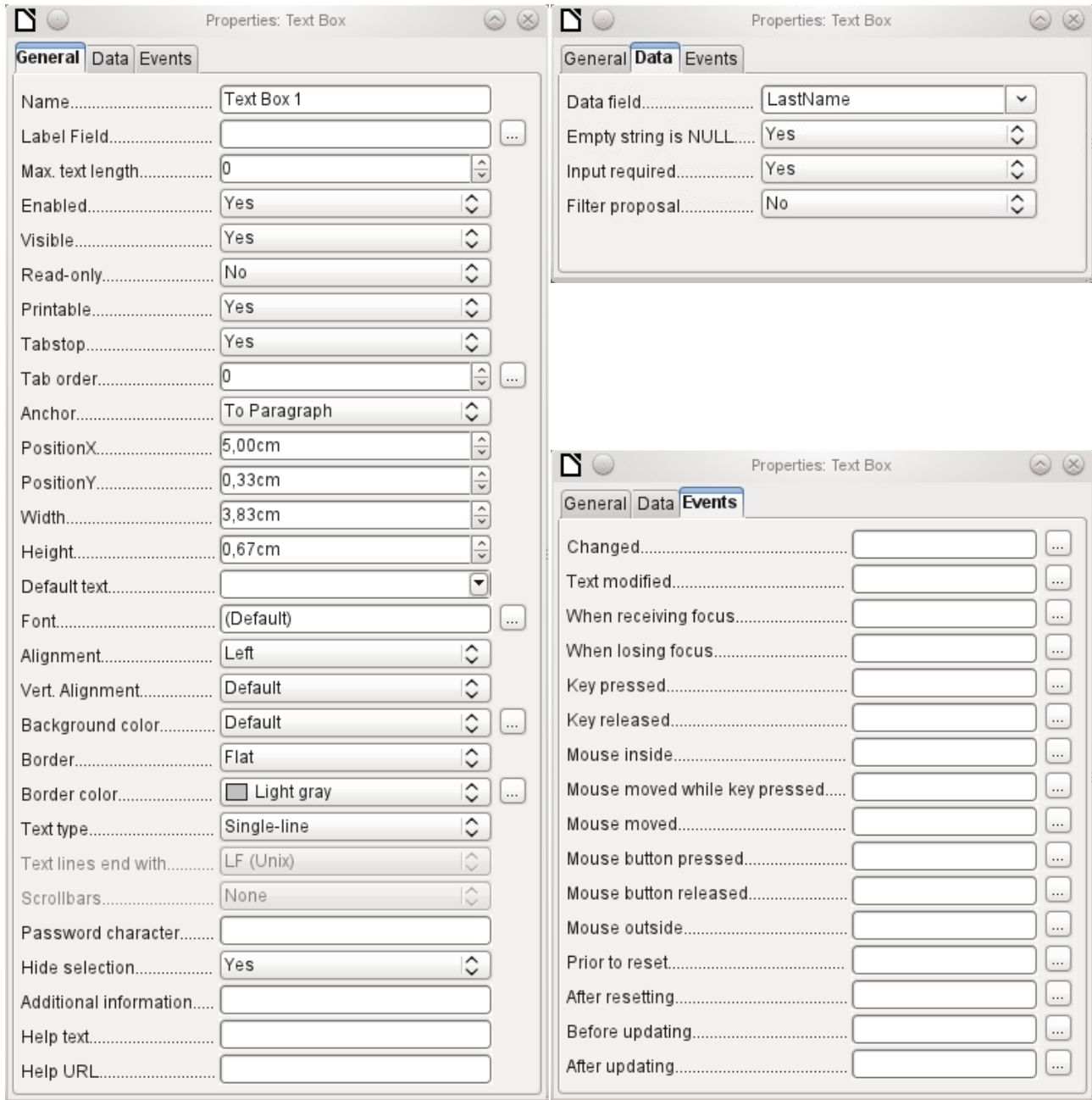
Properties of controls

Once a form has been created, it can be filled with visible controls. Some controls allow the content of the database to be displayed, or data to be entered into the database. Other controls are used exclusively for navigation, for searching, and for carrying out commands (interaction). Some controls serve for additional graphical reworking of the form.

Data entry and Data display	
Control	Use
Text field	Text entry
Numeric field	Entering numbers
Date field	Entering dates
Time field	Entering times
Currency field	Numeric entry, preformatted for currency
Formatted field	Display and entry with additional formatting, for example using measurement units
List box	Choosing between several different possibilities, also for transfer into the database of values other than those displayed
Combo box	Similar to a list field, but with only the displayed value transferred, or you can enter new values by hand
Check box	Yes/No Field
Options button	Radio button; allows you to choose from a small number of possibilities
Image control	Display of images from a database and entry of images into a database via a path selection
Pattern field	Entry into a preset mask; limits the entry possibilities to specific character combinations
Table control	Universal entry module, which can display a whole table. Integrated into this control are many of the above controls
Design	
Control	Use
Label field	Heading for the form, description of other controls
Group box	A frame around, for example, a set of option buttons
Interaction	
Control	Use
Button	Button with label
Image Button	Like a button, but with an additional graphic displayed on it
Navigation bar	Toolbar very similar to the one at the bottom edge of the screen
File selector	For selecting files, for example to upload in an HTML form—not further described
Spin box	Can only be used with a macro—not further described
Scrollbar	Can only be used with a macro—not further described

Default settings for many controls

As with forms, properties are grouped into three categories: General, Data and Events. General comprises everything that is visible to the user. The data category specifies the binding to a field in the database. The Events category controls actions, which can be bound to some macro. In a database without macros, this category plays no role.



General tab

Name..... Text Box 1

The name of a control must be unique within the form—used for access using macros.

Label Field.....

Does the field have a label? This groups field and label together.

Enabled..... Yes

Non-enabled fields cannot be used and are grayed out. Useful for control using macros. (Example: If Field 1 contains a value, Field 2 must not contain one; Field 2 is deactivated.)

Visible..... Yes

Usually **Yes**; invisible fields can be used as intermediate storage, for example in creating combination fields with macros. See Chapter 9, Macros.

Read-only..... No

Yes will exclude any modification of the value. This is useful, for example, for an automatically generated primary key.

Printable..... Yes

Sometimes it is useful to print a page from a form rather than a separate report. In this case, not all fields may be required to appear.

Tabstop..... Yes

Within a form, the *Tab* key is normally used for navigation. A field that is read-only does not need a tab stop; it can be skipped.

Tab order..... 0

Does the field have a tab stop? Here the activation sequence within the form is specified.

Anchor..... To Paragraph

Anchoring of graphics within a text field.

PositionX..... 5,00cm

Position of the top left corner relative to the left side of the form.

PositionY..... 0,33cm

Position of the top left corner relative to the top of the form.

Width..... 3,83cm

Width of the field.

Height..... 0,67cm

Height of the field.

Font..... (Default)

Font, font size, and font effects can be set here.

Alignment..... Left

Alignment. Here text entry is left-justified.

Vert. Alignment..... Default

Vertical alignment: Standard | Top | Middle | Bottom.

Background color..... Default

Background color of the text field.

Border..... Flat

Framing: No frame | 3D-Look | Flat.

Border color..... Light gray

If there is a frame, its color can be set here.

Hide selection..... Yes

Highlighted text loses the highlight when the text field loses focus.

Additional information.....

Used for information to be read by macros. See Chapter 9, Macros.

Help text.....

Appears as a tooltip when the mouse is hovered over the text field.

Help URL.....

Points to a help file, useful mostly for HTML. Can be invoked using *F1* when the focus is on the field.

In addition, numeric, date fields, etc have the following properties.

Strict format..... Yes

With testing enabled, only numbers and decimal points may be entered.

Mouse wheel scroll..... Never

Never does not allow alterations using the mouse wheel; *When selected* allows such changes when the field is selected and the mouse is over the field; *Always* means whenever the mouse is over the field.

Spin Button..... No

A spin symbol is incorporated into the right side of the field.

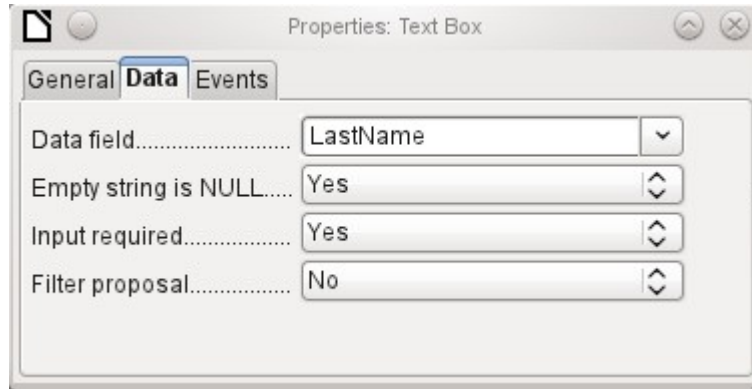
Repeat..... No

If a spin arrow is pressed down and held, this determines if the entry in the box should be incremented beyond the next value.

Delay..... 50 ms

Determines the minimum delay after a mouse button press that triggers repetition.

Data tab



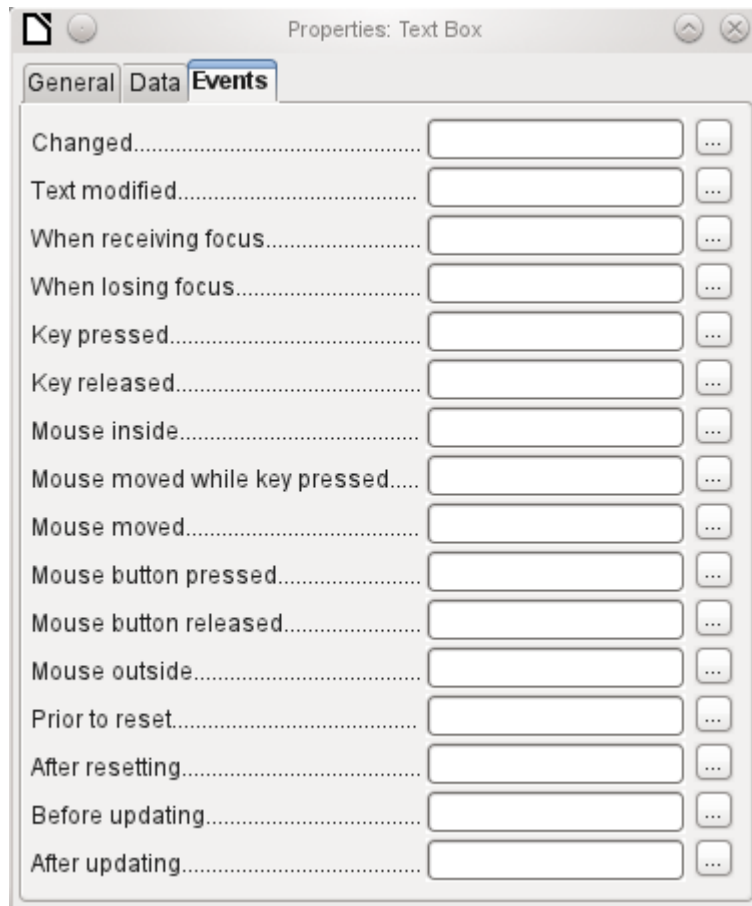
Data field: Here you create the binding with the table on which the form is based.

Empty string is NULL: Whether an empty string should be treated as (NULL) or the content simply deleted.

Entry required: This condition should match the one in the table. The GUI will prompt for entry if the user has not entered a value.

Filter proposal: When the data is to be filtered, the content of this field is temporarily stored as a suggestion. Caution – with large contents, this choice can use a lot of storage.

Events tab



Changed: This event takes place when a control is modified and afterwards loses the focus.

Text modified: Refers to the content, which can in fact be text, numeric, or whatever. Occurs after each additional character is entered.

When receiving focus: The cursor enters the field. Under no circumstances must the macro create a message dialog on the screen; clicking in such a dialog causes the form field to lose the focus and then recover it, triggering the macro again. A loop is created which can only be broken by using the keyboard.

When losing focus: The cursor leaves the field. This can lead to the same kind of interplay when the handling of the event causes it to recur.

Key: Refers to the keyboard. For example, a key is pressed when you move through the form using the Tab key. This causes a field to receive the focus. Then the key is released.

Mouse: Self-explanatory; These events only takes place if the mouse is or was already within the field ("outside" corresponds to the javascript onMouseOut).

Reset: The form is emptied of all data. This happens, for example, when starting a new record. When a form is first loaded, the two events *Prior to reset* and *After resetting* occur in succession, before the form is available for input.

Updating: If the event is bound to a form control, update takes place when the focus is lost and jumps to another form control, after altering the content of the field. Changes in the form are accepted and displayed. When a form is closed, the two events *Before updating* and *After updating* occur in succession.

Text field

As well as the properties set out on page 12, text fields can have the following additional properties:

General tab

Max. text length..... 0

When this value is 0, entry is not permitted. Usually the length of the database field to which the text field corresponds is used here.

Default text.....

Should default text be put into an empty field? This text must be deleted if any other entry is to be made successfully.

Text type..... Single-line

Possible types: Single-line | Multi-line | Multi-line with formatting (the last two differ in tabbing behaviour and, in addition, a pattern field can not be bound to a database). The vertical alignment is not active for multi-line fields.

Text lines end with..... LF (Unix)

Unix or Windows? This mainly affects line endings. Internally Windows lines end with two control characters (CR and LF).

Scrollbars..... None

Only for multi-line fields: Horizontal | Vertical | Both.

Password character.....

Active only for single-line fields.
Changes characters to see only points.

Data tab

Nothing of significance.

Events tab

Nothing of significance.

Numeric field

In addition to properties already described, the following properties exist:

General tab

Value min.....

Minimum value for the field. Should agree with the minimum value defined in the table.

Value max.....

Maximum value.

Incr./decrement value.....

Scrolling increment when using the mouse wheel or within a spin box.

Default value.....

Value displayed when a new record is being created.

Decimal accuracy.....

Number of decimal places, set to 0 for integers.

Thousands separator.....

Separator for thousands, usually a comma.

Data tab

There is no check on whether a field can be NULL. If there is no entry, the field will be NULL and not 0.

No filter proposal is offered.

Events tab

The "Changed" event is absent. Changes must be handled using the "Text modified" event (the word text is not to be taken literally here).

Date field

As well as the properties described on page 12, the following are to be noted.

General tab

Date min.....

Minimum value for the field, selectable using a drop-down calendar.

Date max..... 12/31/2200

Maximum value.

Date format..... Standard (short)

Short form as 10.02.12 or various forms using ' / ' instead of ' . ' or ' - ' in the American style.

Default date.....

Here you can enter a literal date but unfortunately not (yet) the current date (Today) at the time the form is opened.

Dropdown..... No

A month calender for selecting dates can be included.

Data tab

There is no check on whether a field can be NULL. If there is no entry, the field will be NULL and not 0.

No filter proposal is offered.

Events tab

The "Changed" event is absent. Changes must be handled using the "Text modified" event (the word text is not to be taken literally here).

Time field

As well as the properties listed on page 12, the following features are available.

General tab

Time min..... 00:00:00

Minimum value for the field, by default set to 0.

Time max..... 23:59:59

Maximum value, by default set to 1 second before 24:00.

Time format..... 13:45

Short form without seconds, long form with seconds, and also 12-hour formats with AM and PM.

Default time.....

You can set a fixed time but unfortunately not (yet) the actual time of saving the form.

Data tab

There is no check on whether a field can be NULL. If there is no entry, the field will be NULL and not 0.

No filter proposal is offered.

Events tab

The "Changed" event is absent. Changes must be handled using the "Text modified" event (the word text is not to be taken literally here).

Currency field

In addition to the properties already listed on page 12, the following features are available:

General tab

Min. value, Max. value, Increment, Default value, Decimal places, and Thousands separator. correspond to the general properties listed on page 17. In addition to these, there is only:

Currency symbol.....

The symbol is displayed but not stored in the table that underlies the form.

Prefix symbol.....

Should the symbol be placed before or after the number?

Data tab

There is no check on whether a field can be NULL. If there is no entry, the field will be NULL and not 0.

No filter proposal is offered.

Events tab

The "Changed" event is absent. Changes must be handled using the "Text modified" event (the word text is not to be taken literally here).

Formatted field

In addition to the properties listed on page 12, the following features are offered:

General tab

Minimum and maximum values, and the default value, depend on the formatting. Behind the button for Formatting is a flexible field that makes most currency and numeric fields unnecessary. Unlike a simple currency field, a pattern field can show negative sums in red.

Formatting..... ...

The button to the right with the three dots provides a choice of numeric formats, as you usually do in Calc.

Among the numeric formats can be seen, alongside Date, Time, Currency or normal numeric format, possibilities for using fields with a measurement unit such as **kg** (see Figure 7). See also the general Help on numeric format codes.

Data tab

Nothing special to report.

Events tab

The "Changed" event is absent. Changes must be handled using the "Text modified" event (the word text is not to be taken literally here).

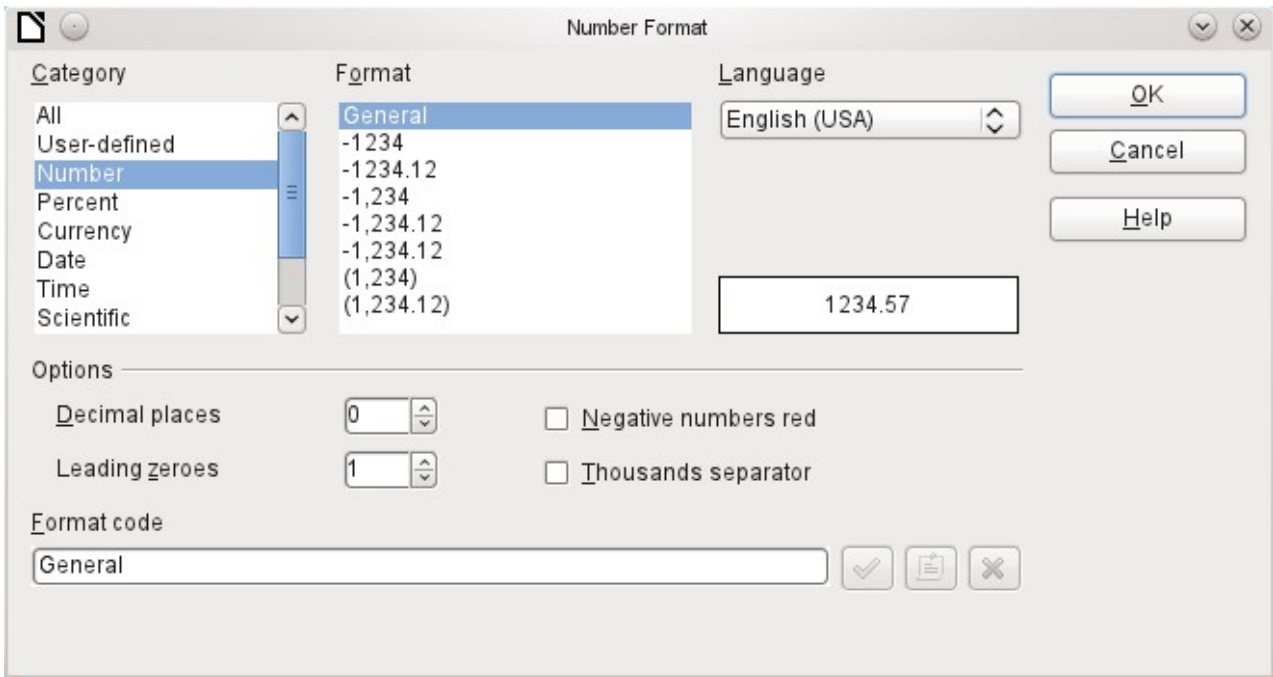
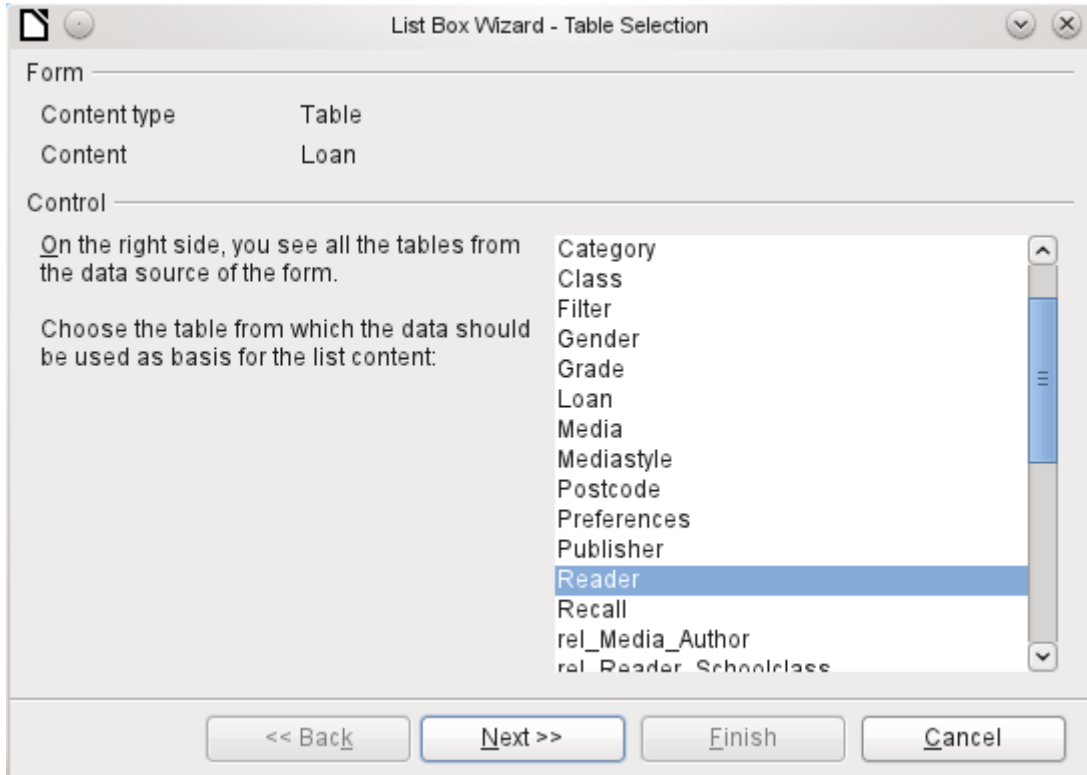


Figure 7: Formatted field with general numeric options

List box

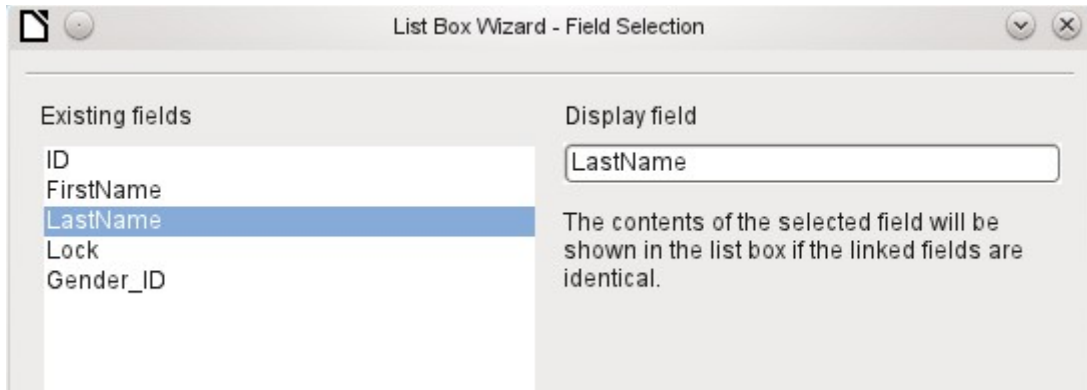
When a list box is created, the List Box Wizard appears by default. This automatic appearance can be switched off if required using the Wizards On/Off button (shown in Figure 4).

Wizard

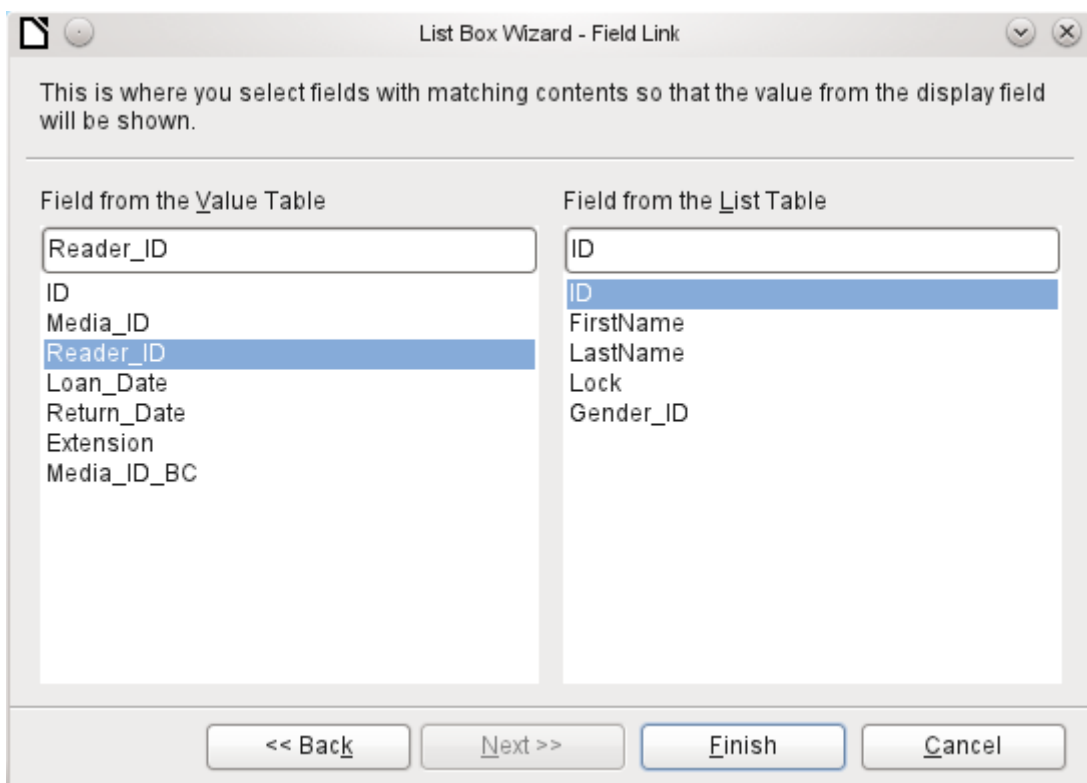


The form is already defined. It is bound to a *Table* named Loans. A list box shows the user different data from what is actually transmitted into the table. This data usually comes from another table in the database, and not from the table to which the form is bound.

The Loans table is supposed to show which Reader has borrowed which Media. However this table does not store the name of the reader but the corresponding primary key from the Reader table. It is therefore the Reader table that forms the basis for the list box.



The *Surname* field from the Reader table should be visible in the list box. This serves as the Display field.



The *Reader_ID* field occurs in the Loan table which underlies the form. This table is described here as the *Value table*. The primary key ID from the Reader table must be bound to this field. The Reader table is described here as the *List table*.

The list box has now been created complete with data and default configuration and is fully functional.

In addition to the properties listed on page 12, the following features are available.

General tab

The list entries have already been set using the Wizard. Here you could add further entries that are not from any table in the database. List entries here means the visible entries, not those that the form will transmit to the table.

If the field is not specified as drop-down, scroll arrows will appear on the right side of the list box when the form is loaded. The list field then automatically becomes a multi-line field, in which the actual value selected is highlighted.

If the field is drop-down, this property gives the maximum visible number of lines. If the content extends over more lines, a scrollbar appears when the list drops down.

Can more than one value be selected? In the above example, this is not possible since a foreign key is being stored. Usually this function is not used for databases, since each field should only contain one value. If necessary, macros can help in the interpretation of multiple entries in the list field.

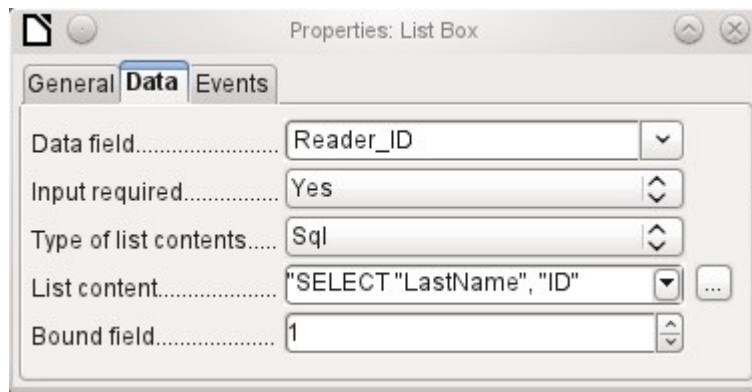
As the deactivated button makes clear, a default selection makes little sense in the context of a binding with a database table, as created by the List Field Wizard. It could well be the case that the record corresponding to the default selection in the example table Readers is no longer present.

Data tab

In addition to the usual data properties *Data field* and *Input required*, there are significant properties which affect the binding between the displayed data and the data to be entered into the table that underlies the form.

Type of list contents: Valuelist | Table | Query | SQL | SQL [Native] | Tablefields

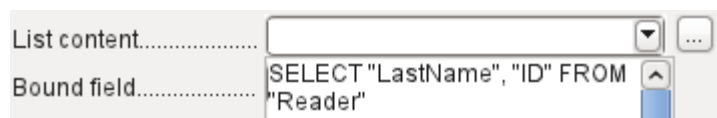
List contents Valuelist: If list entries have been created under **General**, the corresponding values to be stored are entered here. The list contents are loaded with individual items separated by **Shift – Enter**. The *List content* field then shows them as **"Value1";"Value2";"Value3" ...** The *Bound Field* property is *inactive*.



List contents Table: Here one of the database tables can be selected. However this is seldom possible as it requires the content of the table to be so structured that the first table field contains the values to be displayed in the list field, and one of the following fields contains the primary key which the table underlying the form uses as a foreign key. The position of this field within the table is specified in *Bound Field*, where the **Numbering begins with 0 for the first field of the database table**. But this 0 is reserved for the displayed value, in the above example the Surname, while the 1 refers to the ID field.

List contents Query: Here a query is first created separately and stored. The creation of such queries is described in Chapter 5, Queries. Using the query, it is possible to move the ID field from the first position in the underlying table to the second position, here represented by the bound field 1.

List contents SQL: The List Box Wizard fills this field. The query constructed by the Wizard looks like this:



The query is the simplest possible. The Surname field occurs at position 0, the ID field at position 1. Both are read from the Reader

table. As the bound field is Field 1, this SQL formula works. Here should be added **ORDER BY "LastName" ASC**. So you haven't to scroll to long through the list to find somebody. An additional problem might be, that *LastName* could be the same for more than one reader. So *FirstName* must be added in the view of the list box. When there are readers with the same *LastName* and the same *FirstName*, the primary key *ID* must also be shown. See Chapter 5, Queries, for information on how this works.

List contents SQL [Native]: The SQL formula is entered directly, not using the Wizard. Base does not evaluate the query. This is suitable when the query contains functions that might perhaps not be understood by the Base GUI. In this case the query is not checked for errors. More about **direct SQL Mode** can be found in Chapter 5, Queries.

List contents tablefields: Here *Field names* from a table are listed, not their content. For the Reader table, the List contents would be "ID", "Given name", "Surname", "Lock", "Gender_ID".

Events tab

In addition to the standard events, the following events are available:

Execute action: If a value is chosen by the keyboard or the mouse, the list box executes this action.

Item status changed: This could be the change of the displayed content of a list box through the use of the drop-down button. It could also be a click on the drop-down button of the field.

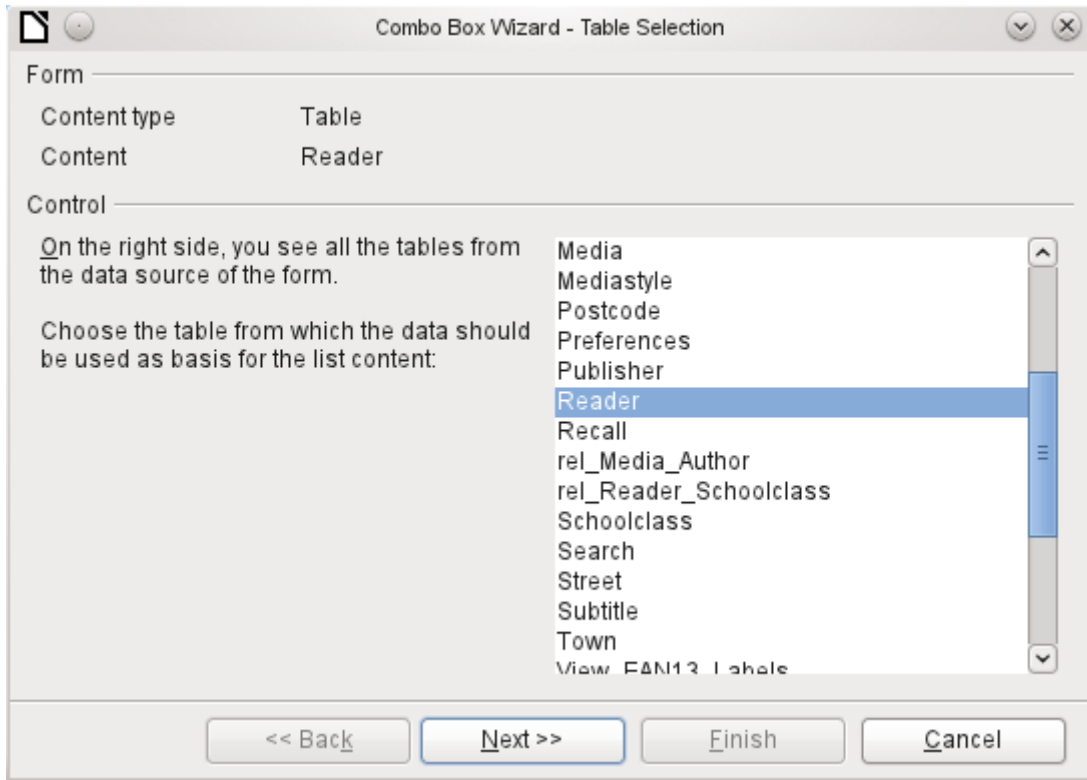
Error occurred: Unfortunately, this event cannot be reconstructed for list boxes.

Combo box

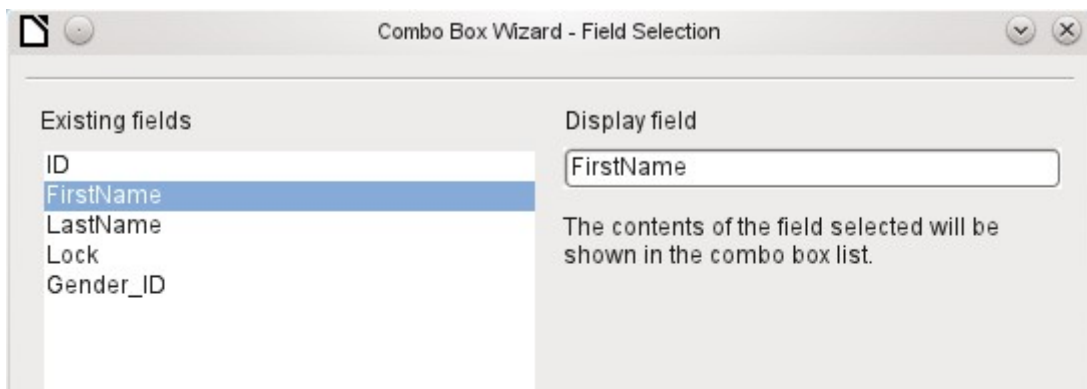
As soon as a combo box is created, a Wizard appears by default, just as with a list box. This automatic behavior can be switched off if necessary using the Wizards On/Off button (see Figure 4).

Combo boxes write the selected text directly into the table underlying the form. Therefore the following example shows both the table linked to the form and the one selected for the control as the Reader table.

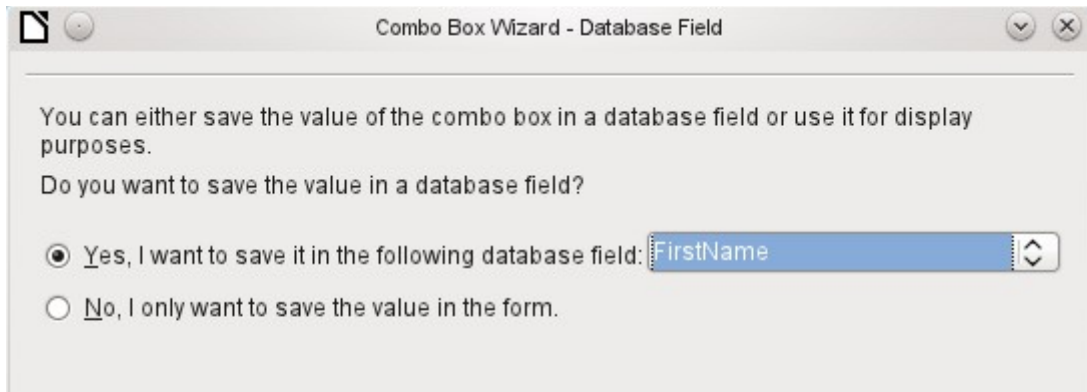
Wizard



Again the form is predefined, this time with the Reader table. As the data to be displayed in the combo box is also to be stored in this table, the source selected for the data for the list is likewise the Reader table.



In the Reader table the FirstName field occurs. This should be displayed in the combo box.

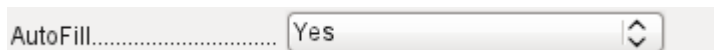


In a database, there seems to be little point in not storing the value of a combo box within a field. We want to read given names from the Reader table, and also to make them available for new readers, so that new records do not need to be created for a given name that already exists in the database. The combo box shows the first name, and text input is not necessary.

If a new value does need to be entered, this can be done easily in a combo box, as the box shows exactly what is going into the underlying table for the form.

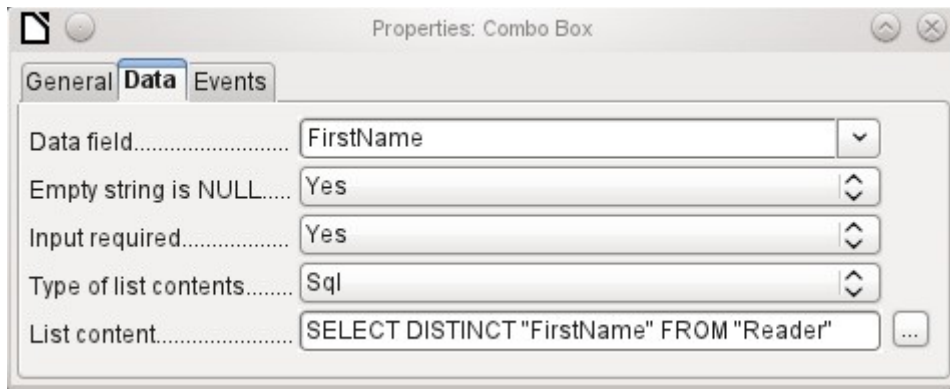
In addition to the properties shown on page 12 and described for list boxes, the following features are available.

General tab



During entry of new values, a list of matching values (if any) is displayed for possible selection.

Data tab



The data fields conform to the existing default settings and the settings for a list box. The SQL command however shows a special feature:

```
SELECT DISTINCT "FirstName" FROM "Reader"
```

Adding the **DISTINCT** keyword ensures that duplicate given names are shown only once. However, creation using the Wizard once more makes it impossible for the content to be sorted.

Events tab

The events correspond to those for a list box.

Check box

The check box appears immediately as a combination of a check box field and a label for the box. In addition to the properties described on page 12, the following features are available.

General tab

Label..... Check Box

The label for this box appears by default to the right of the box. In addition you can bind it to a separate label field.

Default status..... Not Selected

Here, dependent on the choice in the Tri-state field, up to three possibilities are available: *Not selected* | *Selected* | *Not defined*. *Not defined* corresponds to a *NULL* entry in the table underlying the form.

Word break..... No

By default, the label is not broken up. The label is truncated if the field is not big enough.

Graphics.....

Here you can specify a graphic instead of or in addition to the label. You should note that these graphics are not bound into the *.odb document by default. For small graphics, it is useful to embed the graphic and not link it.

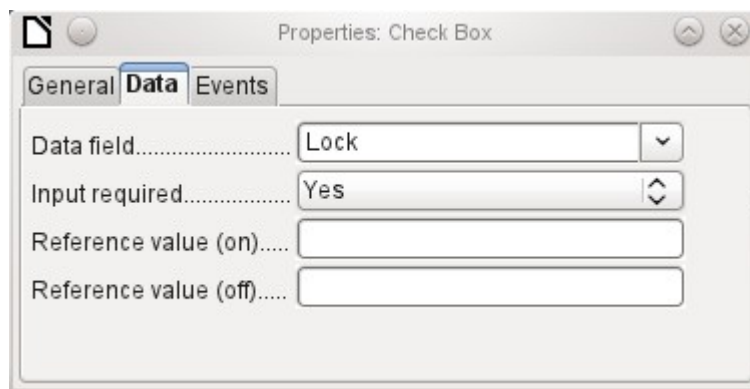
Graphics alignment..... Centered

If you have chosen to use a graphic, its alignment with the label can be set here.

Tristate..... No

By default, checkboxes have only two states: *Selected* (Value: 1) and *Not selected* (Value: 0). With Tri-state, a definition of *Empty field* (NULL) is added.

Data tab



The screenshot shows a dialog box titled "Properties: Check Box" with three tabs: "General", "Data", and "Events". The "Data" tab is selected. It contains the following fields:

- Data field..... Lock
- Input required..... Yes
- Reference value (on).....
- Reference value (off).....

The check box can be given a reference value. However only the values of 1 (for On) or 0 (for Off) can be transferred to the underlying data field (check boxes act as fields for the choice of Yes and No).

Events tab

The fields "Changed", "Text modified", "Before updating" and "After updating" are all absent.

Additional fields for a check box are "Execute action" (see List box) and "Item status changed" (corresponds to "Changed").

Option button

The option button is similar to the check box described above, except for its general properties and its external (round) form.

When several option buttons in the form are linked to the same table field, only one of the options can be selected.

General tab



The option button is designed to be used in groups. One of several options can then be selected. That is why a Group name appears here, under which the options can be addressed.

Data tab

See under Check box. Here, however, reference values that are entered are actually transferred to the data field.

Events tab

See under Check box.

Image control

A image control handles the entry and display of graphical material in the database. The underlying data field must be a binary field.

Entry into a image control takes place either by a double-click with the mouse to open a file selection dialog, or a right-click to choose whether an existing graphic is to be deleted or replaced.

A graphical control by default has no Tab stop.

In addition to the properties described on page 12, the following features are available.

General tab



The graphic selected here is only shown inside the control, while the form is being edited. It has no significance for later input.



No: The image will not be fitted to the field. If it is too big, the field will show a window into the image. The image is not distorted.
Keep ratio: The image is fitted to the control but not distorted (aspect ratio preserved).
Autom. Size: The image is fitted to the control and may be shown in a distorted form.

Data tab

Nothing further to report.

Events tab

The events "Changed", "Text modified", "Before updating" and "After updating" are missing..

Pattern field

An input mask is used to control input into the field. Characters are pre-specified for particular positions, determining the properties of entered characters. The preset characters are stored along with the entered ones.

In addition to the properties described on page 12, the following features are available.

General tab



This determines what characters can be entered.



This is what the form user sees.

The following content is taken from LibreOffice Help:

The length of the edit mask determines how many characters may be entered. If the user's entry does not match the mask, the entry is rejected on leaving the control. The following characters are available for defining the edit mask.

Character	Meaning
L	A text constant. This position cannot be edited. The actual character is displayed at the corresponding position in the literal mask.
a	Represents any of the letters a-z/A-Z. Capital letters are not converted into lower case.
A	Represents any of the letters A-Z. If lower-case letters are entered, they will automatically be converted to upper case.
c	Represents any of the characters a-z/A-Z plus the digits 0-9. Capital letters are not converted into lower case.
C	Represents any of the letters A-Z plus the digits 0-9. If lower-case letters are entered, they will automatically be converted to upper case.
N	Only the digits 0-9 can be entered.
x	All printable characters are allowed.
X	All printable characters are allowed. If lower-case letters are entered, they will automatically be converted to upper case.

So, for example, you can define the literal mask as "__/__/2012" and the edit mask as "NNLNNLLLLL", to allow the user to enter four characters only for a date.

Data tab

Nothing further to report.

Events tab

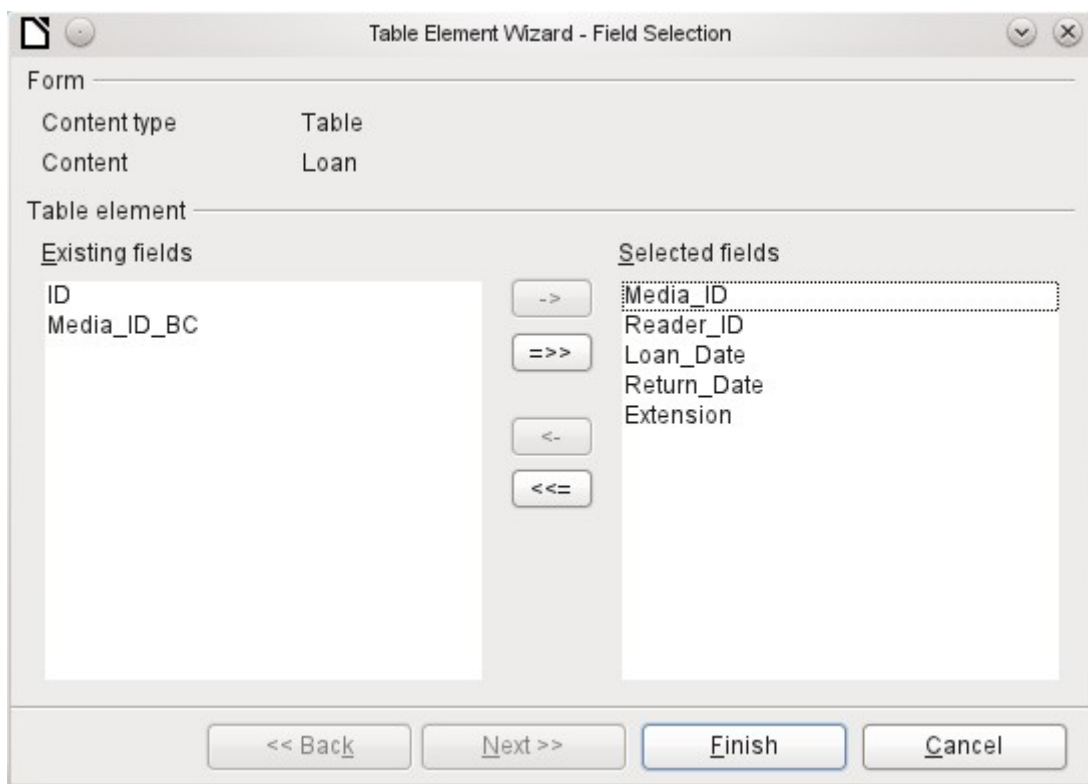
The "Changed" event is absent.

Table control

This is the most comprehensive control. It provides a table, which can then be provided with controls for individual columns. This not only allows the actual data to be viewed during input, but also the previously entered data, without the need to use the Navigation bar to scroll through the records.

Not every field that is possible in a form can be selected for a table control field. Push buttons, image buttons and option buttons are not available.

The Table Control Wizard assembles in a window the fields that will appear afterwards in the table.



In the control the Loans table is available for editing. In addition to the ID (primary key) field and the Media_ID_BC field (entry of media using a bar-code scanner), all fields are to be used in the control.

The previously created table control must now be further developed, to allow entry into the Loans table. For fields such as *Reader_ID* or *Media_ID*, it would be more useful to be able to choose the reader or the media directly, rather than a number representing the reader or media. For this purpose, controls such as list boxes can be placed within the table control. This is declared later. The formatting of the *Extension* field with two decimal places was certainly not intended.

	Media_ID	Reader_ID	Loan_Date	Return_Date	Extension
▶	1.00	0.00	11/02/11	11/04/11	
	2.00	2.00	10/15/11	02/25/12	2.00
	0.00	3.00	11/02/11	04/04/12	1.00
	3.00	0.00	11/04/11	11/28/11	2.00
	5.00	0.00	11/28/11	02/03/12	
	4.00	0.00	11/28/11	04/04/12	
	4.00	0.00	11/09/11	04/05/12	
	3.00	0.00	12/09/11		
	7.00	0.00	12/09/11	04/04/12	

Record 1 of 19

Figure 8: Output of the Table Control Wizard

In addition to the properties listed on page 12, the following features are available.

General tab

Row height.....

Height of individual lines. With no value here, the height is automatically adjusted to the font size. Multi-line text fields are then shown as single lines to be scrolled.

Navigation bar.....

As with tables, the lower edge of the control shows the record number and navigation aids.

Record marker.....

By default there is a record marker on the left edge of the control. It indicates the current record. You can use the record marker to access the delete function for the whole record.

Data tab

Since this is a field that contains no data itself but manages other fields, there are no data properties.

Events tab

The "Changed" and "Text modified" events are missing. The "Error occurred" event is added.

Label field

In addition to the properties described on page 12, the following features are available.

General tab

Word break.....

By default a label is not wrapped. If it is too long for the field, it is truncated. Caution: word wrapping does not recognize spaces, so if the field is too small, a break can occur within a word.

Data tab

None.

Events tab

The label field reacts only to events that are connected with the mouse, a key or the focus.

Group box

A group box graphically groups several controls and provides them with a collective label.

If a group box is created with Wizards active, the Wizard proceeds from the assumption that several option buttons will occur together within this frame.

Group Element Wizard - Data

Form

Content type	Table
Content	Reader

Which names do you want to give the option fields?

male

>>

<<

Option fields

female

<< Back Next >> Finish Cancel

This form is based on the Reader table. We are dealing with the choice of gender. The entries are the labels of the option buttons.

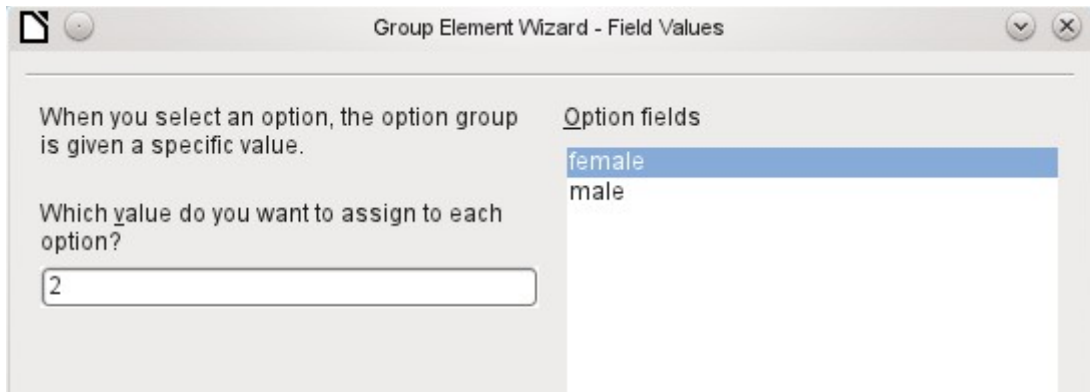
Group Element Wizard - Default Field Selection

Should one option field be selected as a default?

Yes, the following: female

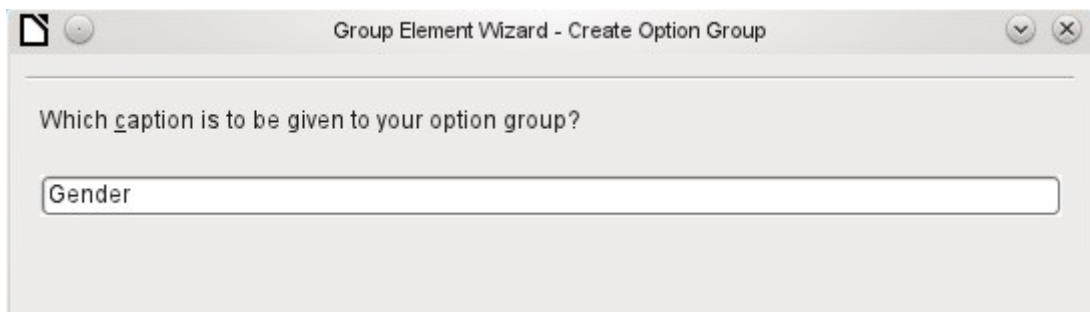
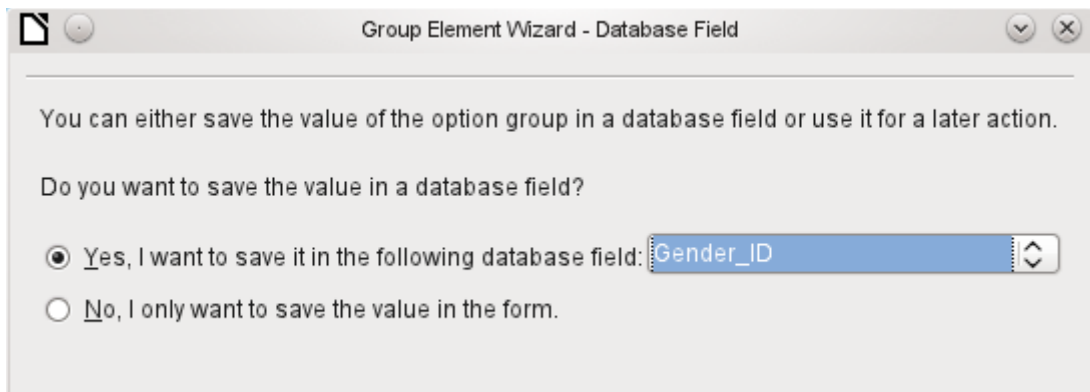
No, one particular field is not going to be selected.

Here the default option is "female". If there is to be no default field, the default entry in the underlying table is *NULL*.

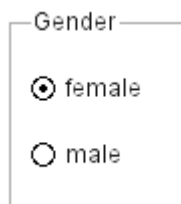


The Wizard gives the option buttons separate values by default, here 1 for female and 2 for male. These values correspond to the examples of primary key fields in the Gender table.

The value selected by clicking an option button is transferred to the *Gender_ID* field of the form's underlying table Readers. In this way the Readers table is provided with the corresponding foreign key from the Gender table by using the option button.



The option button group is given a group box (frame) with the label Gender.



If female is selected in the active form, male is deselected. This is a characteristic of option buttons that are bound to the same field in the underlying table. In the example shown above, the option buttons replace a two-element list box.

In addition to the properties described on page 12, the following features are available.

General tab

The label can be changed from its default value. At present the frame properties (Line thickness, line color) cannot be changed but you can change the font formatting.

Data tab

None, since this control serves only for visual grouping of fields.

Events tab

The group box reacts to events involving the mouse, a key, or the focus.

Push button

In addition to the properties described on page 12, the following features are available.

General tab

Label..... Push Button

Label on the button.

Take Focus on Click..... Yes

The button receives the focus when it is clicked.

Toggle..... No

If Yes, the button can be shown pressed in. The button state is shown as for a switch. When you press it a second time, it shows an unpressed button.

Default status..... Not Selected

Active, when Toggle is set to Yes. *Selected* corresponds to the pressed-in button.

Word break..... No

Word wrapping if the button is too narrow.

Action..... None

A variety of actions similar to those for the navigation bar are available.

URL.....

HTML: File to be called up with this button.

Frame.....

Only for HTML forms: The target-frame (frame arrangement for different HTML pages) in which the file should be opened.

Default button..... No

The default button is framed when this is set to Yes. When there are several alternative buttons on a form, the one most often used should have this characteristic. It is activated by pressing the Enter key, when no other action needs to depend on this key. Only one button on the form can be the default button.



Should a graphic appear on the button?



Only active when a graphic has been selected. Specifies the alignment of the graphic to the text.

Data tab

None. A button only carries out actions.

Events tab

"Approve action", "Execute action" and "Item status changed".

Image button

In addition to the properties already described on page 12, the following features are available.

General tab

Similar to a normal button. However this button has no text and the button itself is not visible. You see only a frame around the graphic.

By default, an image button has no tab stop.

Caution: at the time of writing, hardly any actions work with this button. It is practically only usable with macros.

Data tab

None; this control only carries out actions.

Events tab

"Approve action" and all events involving the mouse, a key, or the focus.

Navigation bar



Figure 9: Navigation bar control

The standard Form Navigation bar is inserted into forms at the lower edge of the screen. The insertion of this toolbar can cause a brief rightward shift of the form as it builds up on the screen. This can be distracting in cases where the navigation bar is switched off again for some parts of the visible form, for example when there are subforms or more than one form in the visible form.

By contrast, a navigation bar control that is part of the form, separate from the corresponding items, makes it clear through which items you navigate with the toolbar. The form for Loans, for example, needs to search first through the readers and then show the media loaded to the reader. The navigation bar control is positioned near the reader, so the user notices that the navigation bar is used for the reader and not for the media loaned to the reader.

The standard Form Navigation bar makes available the buttons shown in Figure 10. The navigation bar control shows the same buttons except those for Find Record, Form-Based Filters and Data source as Table.

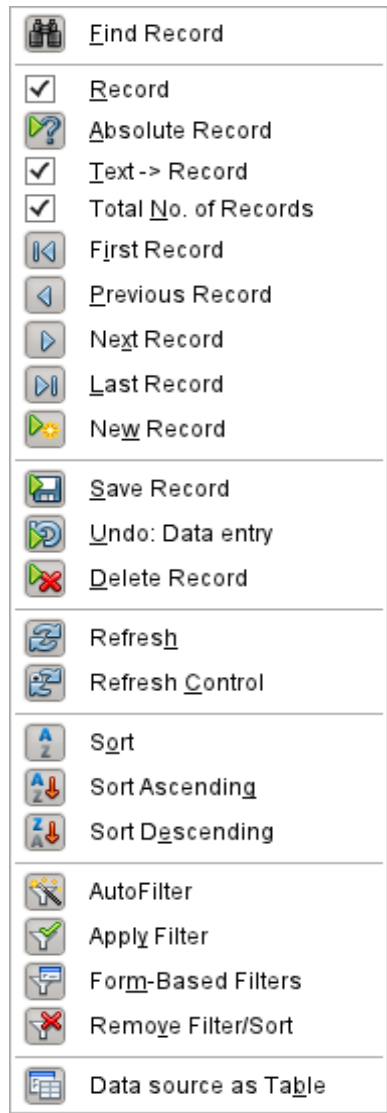


Figure 10: Navigation buttons

In addition to the properties listed on page 12, the following features are available for the Navigator Bar control.

General tab

Icon size.....	Small	⬇
Positioning.....	Show	⬇
Navigation.....	Show	⬇
Acting on a record.....	Show	⬇
Filtering / Sorting.....	Show	⬇

The icon size is adjustable. In addition you can choose which groups are displayed. These are shown in Figure 9 from left to right using a vertical line as a group separator: Positioning, Navigation, Acting on a record, and groups of commands for Filtering and Sorting.

Data tab

None, as this control only carries out actions.

Events tab

All events that involve the Mouse, a key, or the focus.

Independent of this form control, the **insertable navigation bar** naturally continues to exist with the same items as the above figure.

This insertable navigation bar provides additionally the *general record search*, the *form-based filter* and the display of the form's underlying *data source in table view* above the form.

If you are working not just with a form but with subforms and ancillary forms, you must be careful that this insertable navigation bar does not disappear as you switch forms. That creates a disturbing effect on the screen.

Multiple selection

If you use the Select icon (Figure 4) to select a large region or several elements of a form, the following modifications may be carried out (see Figure 11).

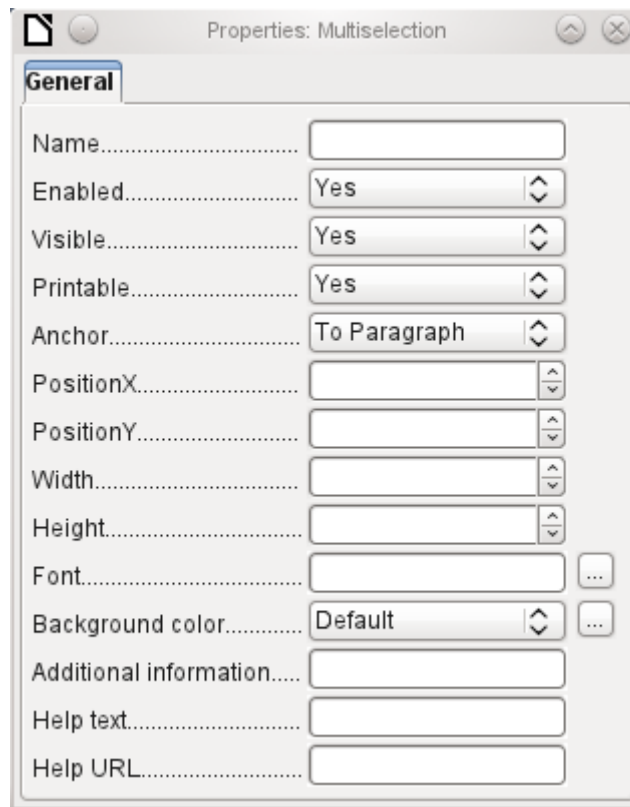


Figure 11: General properties of form fields in a multiple selection

You should not alter the name. That would cause all the selected elements suddenly to acquire the same name. It would make finding individual elements using the Form Navigator difficult, and management of the form by using named controls in macros impossible.

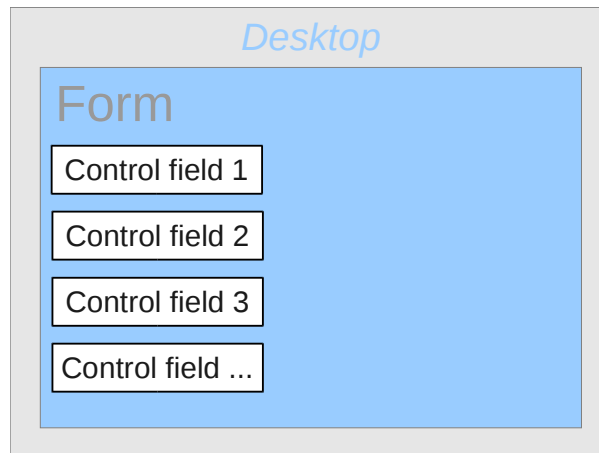
Multiple selection is more useful for changing the font, the height or the background color of controls. Note that changing the background color affects the labels as well.

If you want to alter only the labels, hold down the *Control* key and click these controls directly or in the Navigator, or right-click on a field to call up the control properties. Now the choice of properties that you can change is greater as you are dealing only with similar fields. You can change anything here that is available in a label field.

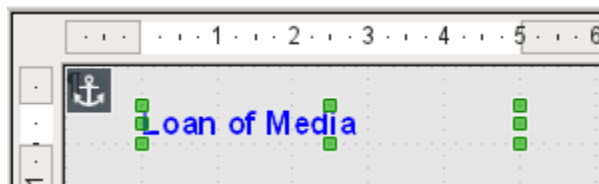
The possibilities of multiple selection depend therefore on the choice of fields. You can simultaneously change controls of the same kind that have all the properties that exist for a single instance.

A simple form completed

A simple form has form controls for writing or reading records from a single table or query. Its construction is shown by the following example.



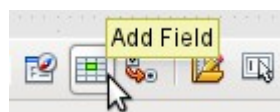
The example of a simple form for library loans is shown here using several variants. The quick way to use the Form Wizard is described in Chapter 8, Getting Started with Base, in the *Getting Started with LibreOffice* guide. Here we describe the creation in Design View.



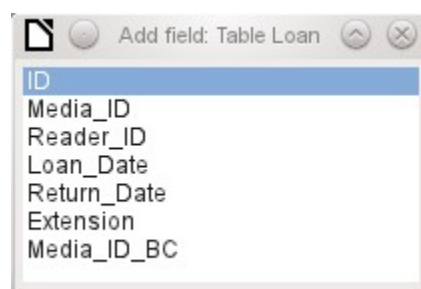
The heading for the form was created using a label field. The font was changed. The label field is anchored to a paragraph in the top left corner of the document. Using the context menu of the label field, a form was created that was linked to the Loans table (see "Form properties" on page 8). The page has also been given a uniformly colored background.

Adding groups of fields

A quick variant for direct entry of fields with labels is to use the *Add Field* function.



This function, available on the Formula Design toolbar (see Figure 2), allows all fields of the underlying table to be selected.



Double-click on the fields to insert them into the form as a group with labels (unfortunately all on the same spot). The group needs to be separated out so that the form eventually looks like the following illustration. For a better view, all unnecessary toolbars have been removed from the window, which has also been compressed so that not all elements of the Navigation bar are visible. All fields have been selected except *Media_ID_BC*, which is designed to be used only with a barcode scanner.

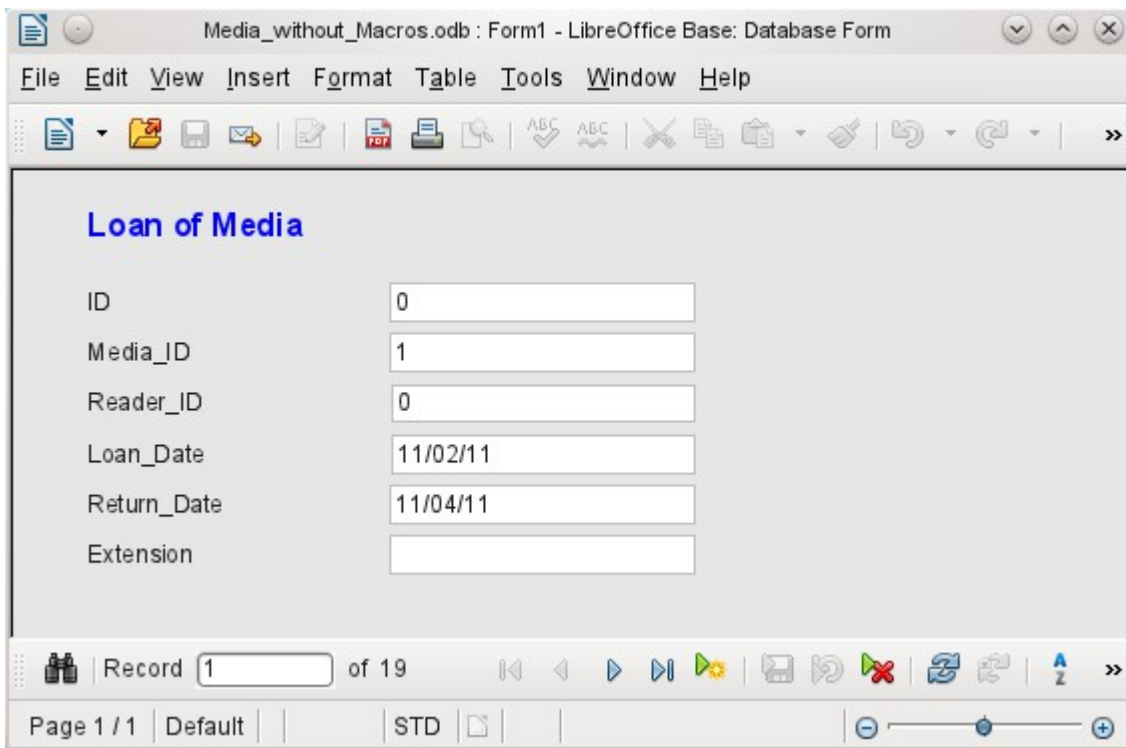


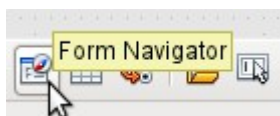
Figure 12: Simple form made by using Add Field

For each table field, an appropriate form control has been automatically selected. Numbers are in numeric fields and are declared as integers without decimal places. Date fields are represented correctly as date controls. All fields have been given the same width. If a graphical control had been included, it would have been given a square field.

Adjusting field proportions

We can now do some creative things, including adjusting the length of the fields and making the dates into drop-down fields. More important still is for the *Media_ID* and the *Reader_ID* fields to be made more user-friendly, unless every library user has a library ID card and every medium is supplied with an ID on accession. That will not be assumed in what follows.

To adjust individual fields, we must edit the group. This can be done with a right-click on the group and then following the context menu (Figure 13). For future work, it will be clearer if we use the Form Navigator.



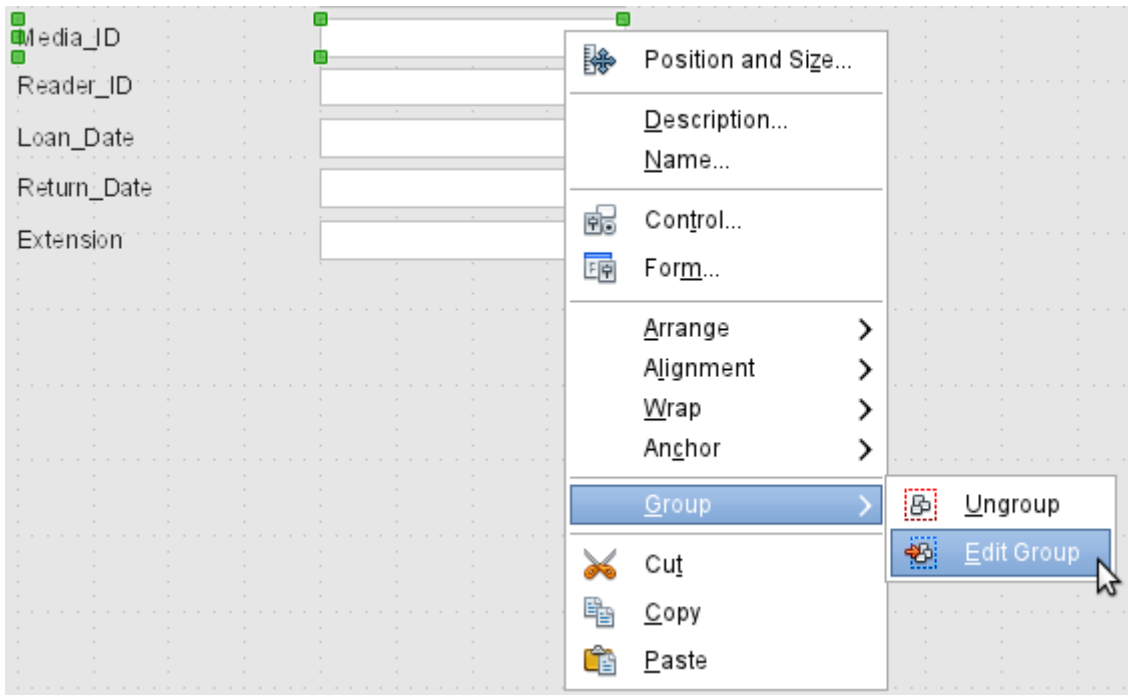


Figure 13: Form controls: editing the group

The Form Navigator displays all the elements of the form with their labels. For controls, the names are taken directly from the names of the fields in the underlying table. The names of the labels have the suffix *Label*.

A click on *Media_ID* selects this field (Figure 14). Right-click to replace the selected field with a different type of field, using the context menu (Figure 15).

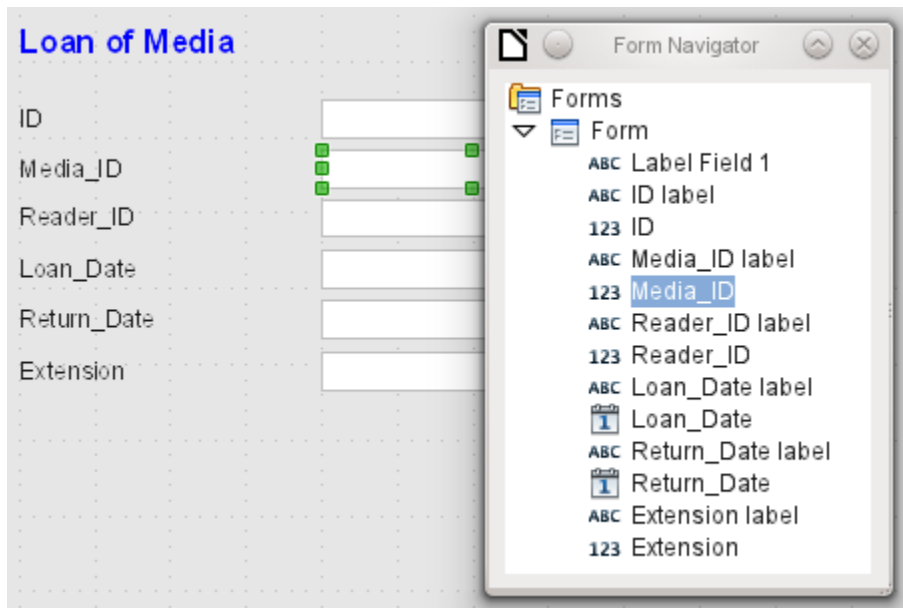


Figure 14: Selecting form controls directly using the Form Navigator

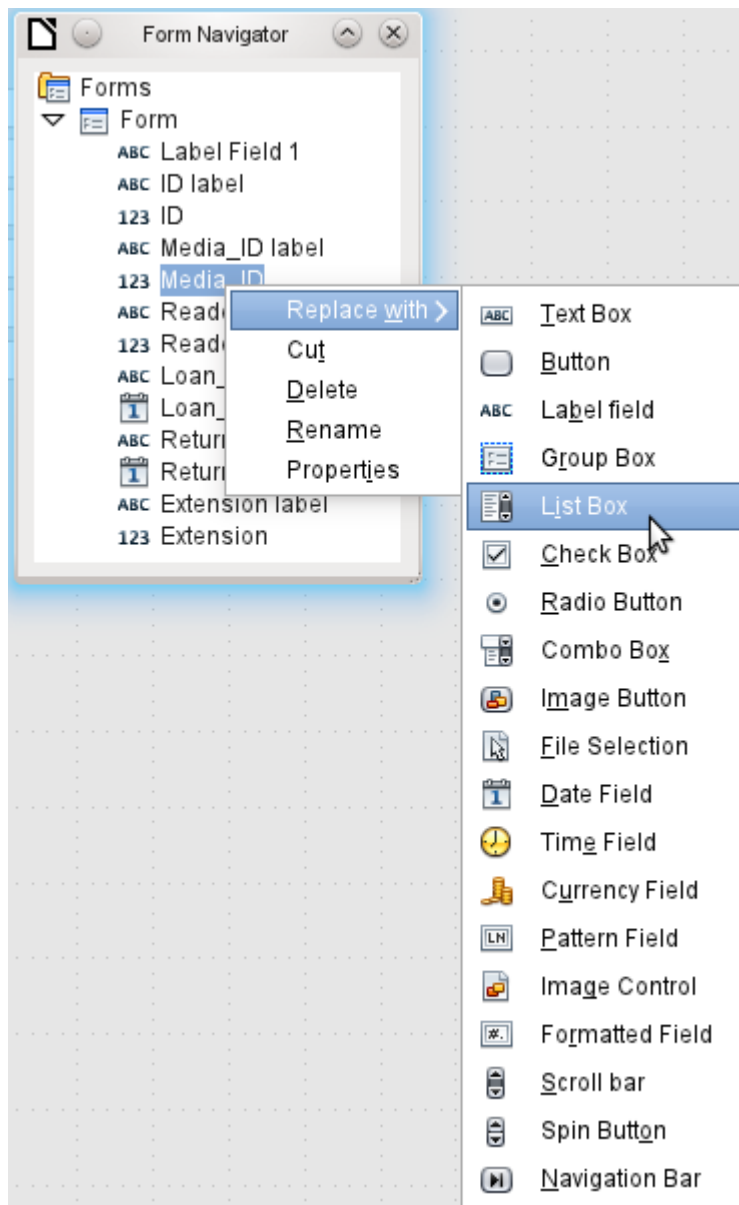
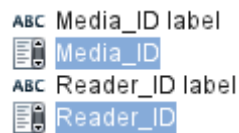


Figure 15: Replacing one kind of control by another using the Form Navigator

This replacement is carried out for the *Media_ID* and *Reader_ID* controls.



The change is made visible in the Form Navigator by the change in the accompanying icon.



The SQL query for the list field can now be created through the graphical user interface by clicking on the button at the right. This is carried out automatically when a list box is created directly, but not when it is formed by conversion from another type of control. For the SQL command, see Chapter 5, Queries.

Since the list boxes are to be made drop-down, the following defects can be corrected at the same time:

- The labels for the list boxes should be *Media* instead of *Media_ID* and *Reader* instead of *Reader_ID*.
- The *ID* control should be declared as read-only.
- Any fields which are not absolutely necessary for issuing loans for a new medium do not need a tab stop. Without it, the form can be traversed much faster. If necessary, the tab stop can also be adjusted using the activation sequence (see page 12). Only the *Media*, *Reader* and *Loan date* fields must be accessible in all cases using the *Tab* key.
- If the form is intended for carrying out loans, it is unnecessary and also confusing for returned media to be displayed. Media with a return date should be filtered out. In addition, the display order could be sorted by *Reader*, so that media on loan to the same person are displayed successively. See the note on “Form properties” on page 8. However there is a problem here in that readers can be sorted only by ID, not alphabetically, because the table underlying the form only contains the ID.

Adding single fields

The addition of single fields is a bit more complicated. The fields must be selected, dragged onto the form surface, and the appropriate field from the underlying table specified. In addition, the type of field must be correctly chosen; for example, numeric fields have two decimal places by default.

Only when creating list boxes does the Wizard come into play, making it easier for a novice to carry out the steps for creating correct fields—up to a point. Beyond that point, the Wizard ceases to meet requirements because:

- The entries are not automatically sorted.
- Combining several fields in the list box content is not possible.

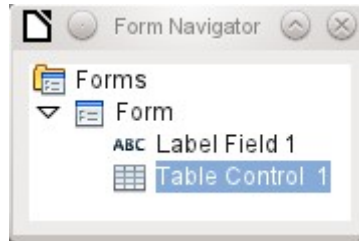
Here again we need to make retrospective improvements, so that the required SQL code can be created quite quickly using the built-in query editor.

When adding single controls, the field and its label must be explicitly associated (see “Default settings for many controls” on page 12). In practice it could be better if you do not associate fields with the labels. So you must not choose **Edit Group** before changing the properties of a field.

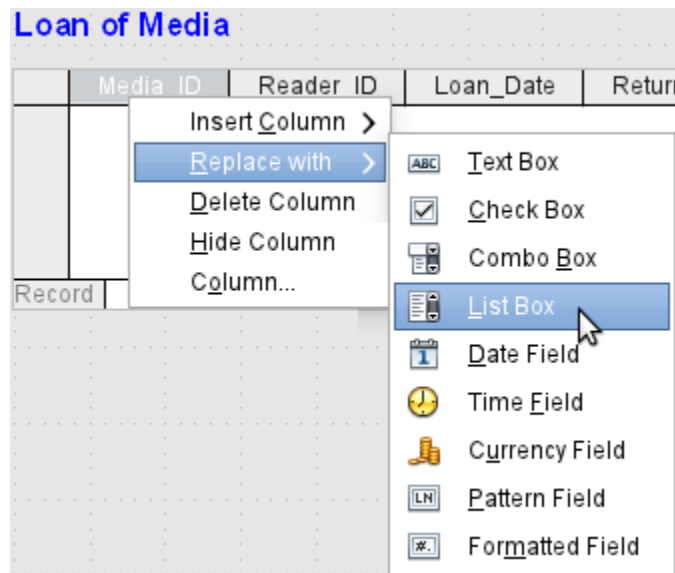
Table control

The use of the Table Wizard to create a table control has already been described on page 29. It has however some defects which need to be improved:

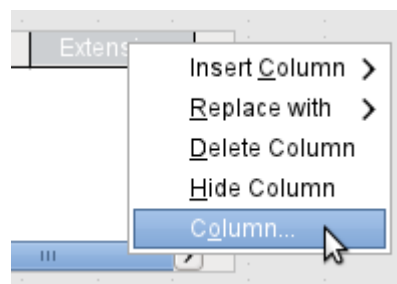
- The *Media_ID* and *Reader_ID* fields must become list boxes.
- Numeric fields must be stripped of their decimal places, since the Wizard always specifies two decimal places for numbers.



Changing fields within the table control is not possible using the same method as described for other controls. In the Navigator, the description of fields ends with the table control. The Navigator knows nothing about the controls that lie within the table control, referring to fields in the underlying table. This equally applies later, when attempts are made to access the fields using macros. They cannot be accessed by name.



The controls within the table control are called columns. Using the context menu, it is now possible to replace one type of field by another. However the whole range of types is not available. There are no push buttons, option boxes, or graphical controls.



The properties of the fields are hidden in the context menu behind the concept of columns. Here, for example, the numeric field *Extension* can be changed so that no decimal places are shown.

Also the default minimum value of $-1,000,000.00$ hardly makes sense for a loan extension. The number should always remain small and positive.

As soon as the properties of a column are called up, you can select another column without shutting the properties dialog. In this way you can work on all the fields, one after another, without having to save in between.

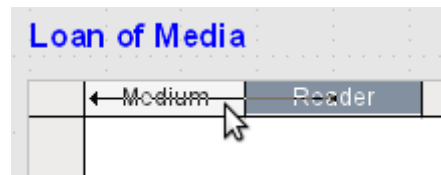
End by saving the entire form, and finally the database itself.

The properties of the fields built into a table control are not so comprehensive as for those outside. The font, for example, can be set only for the entire table control. In addition, you do not have the option of skipping individual columns by removing their tab stops.

Tip

You can move through a form using either the mouse or the *Tab* key. If you tab into a table control, the cursor will move one field to the right for each additional tab; at the end of the line, it will move back to the first field of the next record in the table control. To exit the table control, use *Ctrl+Tab*.

The order of the columns can be changed by dragging the column header:



If this is done in form design view, it is permanent. A temporary change in order can be carried out during data entry by using the same method.

If only certain fields should be visible during use, you can use several different table controls in the form, as the *Tab* is captured by default by each table control.

The form shown in Figure 16 is for the loan of media. Only the fields immediately necessary are shown in the upper table control. The lower one shows all the fields, so that it is apparent which person and medium the return is for.

	Reader	Medium	Loan_Date	
▶	Lederstrumpf, Bert	Das sogenannte Böse	11/02/11	^
	Gerd, Lisa	Eine kurze Geschichte der Zeit	10/15/11	≡
	Mirinda, Monika	Der kleine Hobbit	11/02/11	
	Lederstrumpf, Bert	Traditionelle und kritische Theori	11/04/11	
	Lederstrumpf, Bert	I hear you knocking	11/28/11	
	Lederstrumpf, Bert	Die neue deutsche Rechtschreib	11/28/11	
	Lederstrumpf, Bert	Die neue deutsche Rechtschreib	11/09/11	▼

Record 1 of 19

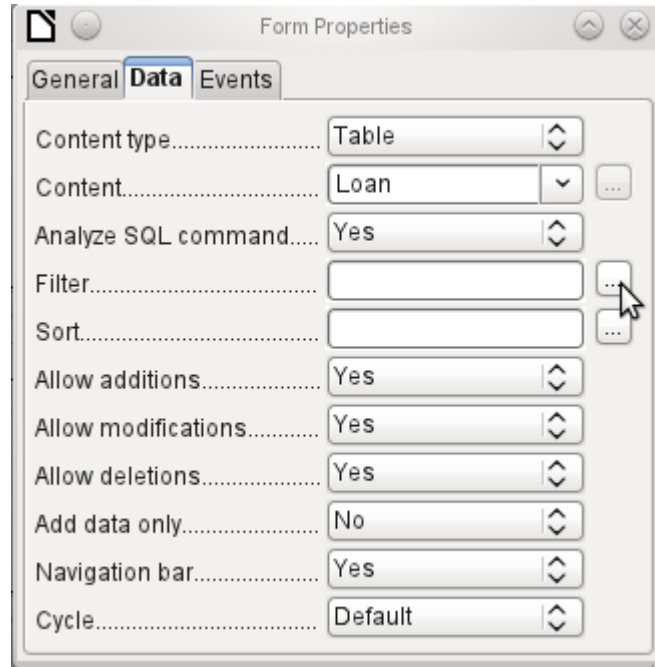
	Reader	Medium	Loan_Date	Extension	Return_Date	
▶	Leders	Das sogenn	11/02/11		11/04/11	^
	Gerd, Lisa	Eine kurze G	10/15/11	2	02/25/12	≡
	Mirinda, Mor	Der kleine H	11/02/11	1	04/04/12	
	Lederstrum	Traditionelle	11/04/11	2	11/28/11	
	Lederstrum	I hear you kn	11/28/11		02/03/12	
	Lederstrum	Die neue de	11/28/11		04/04/12	
	Lederstrum	Die neue de	11/09/11		04/05/12	▼

Record 1 of 19

Figure 16: A form with multiple table controls

This figure shows an aesthetic failing that needs urgent attention. In the upper table control, the same medium sometimes occurs more than once. This happens because the table also shows media that have been returned earlier. Therefore the data needs to be filtered to show only the loans. Records with a return date should not appear.

This filtering is possible either by a query or directly using the form properties. If it is done using the form properties, the filter can be temporarily switched off during input. Filtering using a query is described in Chapter 5, Queries. Here we describe how to do it using form properties.



The filtering is carried out using the button with the three dots, which opens the dialog shown below. You can also enter the filter directly into the *Filter* text field if you know the SQL coding.



Using the GUI, you can now select the field named *Return_Date*. It will show only the records for which the field is empty, where “empty” stands for the SQL designation NULL.

The cleaned-up form (shown in Figure 17) now looks rather simpler.

Of course there is still room for improvement, but compared with the earlier form, this version has a clear advantage in that all the media are visible at a glance.

The processing of data using table controls is similar to using an actual table. A right-click on the record header of an existing record causes it to be deleted, and an entry can be canceled or saved in the case of new records.

When you leave a line, the record is automatically saved.

Loan of Media

Reader	Medium	Loan_Date
Lederstrumpf, Bert	Traditionelle und kritische Theori	12/09/11
Lederstrumpf, Bert	Das Postfix-Buch	02/25/12
Nobody, Terence	Der kleine Hobbit	04/04/12
Müller, Heinrich	Eine kurze Geschichte der Zeit	04/04/12
Lederstrumpf, Bert	Das sogenannte Böse	04/04/12
Müller, Heinrich	Im Augenblick	04/22/12
Gerd Lisa	Datenbanken mit OpenOffice.org	10/17/12

Record 1 of 7

Reader	Medium	Loan_Date	Extension	Return_Date
Leders	Traditionelle	12/09/11		
Lederstrum	Das Postfix-l	02/25/12		
Nobody, Ter	Der kleine H	04/04/12		
Müller, Hein	Eine kurze G	04/04/12	1	
Lederstrum	Das sogenn	04/04/12		
Müller, Hein	Im Augenblic	04/22/12		
Gerd Lisa	Datenbanke	10/17/12		

Record 1 of 7

Figure 17: Amended form

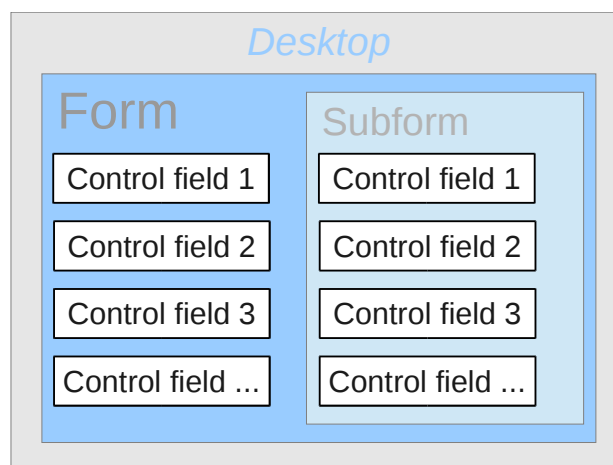
We can still improve the Loan of Media form in a number of ways.

- It would be nice if selecting a reader in one part of the form caused the media on loan to this reader to be displayed in another.
- In the table shown above, you can see a lot of records that are not necessary because these media are already on loan. The table was created to allow loans to be made, so it would be better if only an empty page appeared, which could then be filled with the new loan.

Such solutions are available using further forms that are hierarchically arranged and make possible separate views of the data.

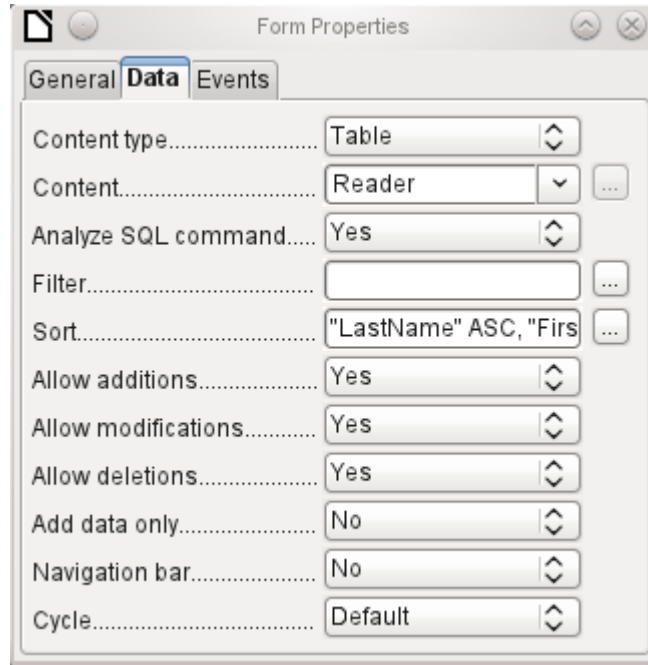
Main forms and subforms

A subform lies within a form like a form control. Like a form control, it is bound to data from the main form. However its data source can be another table or a query (or a SQL command). The important thing for a subform is that its data source is somehow linked to the data source of the main form.

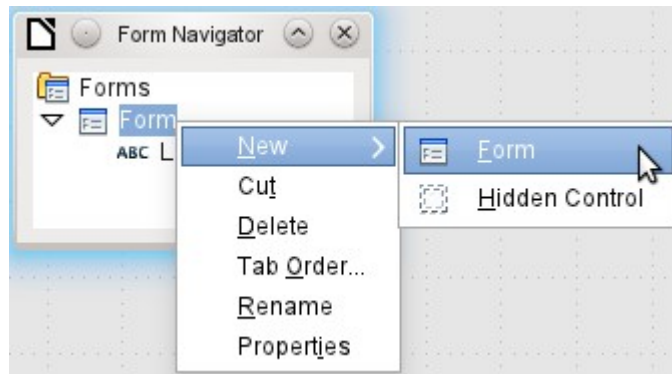


Typical table structures that lend themselves to use as subforms are tables with a one-to-many relationship (see Chapter 3, Tables). The main form shows a table with records to which many dependent records in the subform can be linked and displayed.

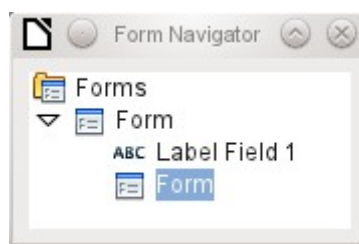
First we will use the relationship of the Reader table to the Loan table (see Chapter 3, Tables). The Reader table will form the basis for the main form and the Loan table will be reproduced in the sub-form.



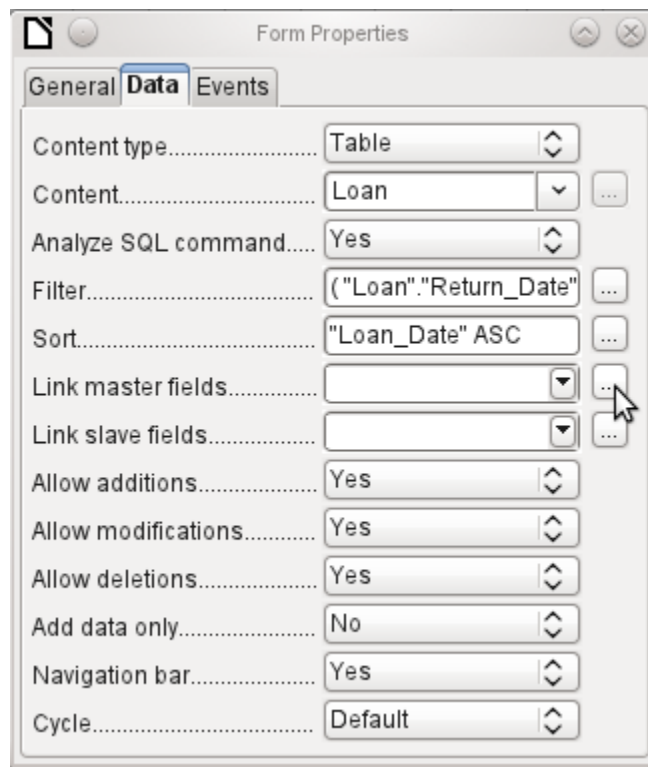
Here the main form is linked to the Reader table. To speed up the search for readers, the table is sorted alphabetically. We will do without a navigation bar, since the content of the subform would come between the main form and the navigation bar. Instead we will use the built-in form control (Figure 9).



Right-click on the main form in the Form Navigator to use the context menu to create a new form. Once again this form has the default name of Form, but it is now an element in the subfolder of the main form.

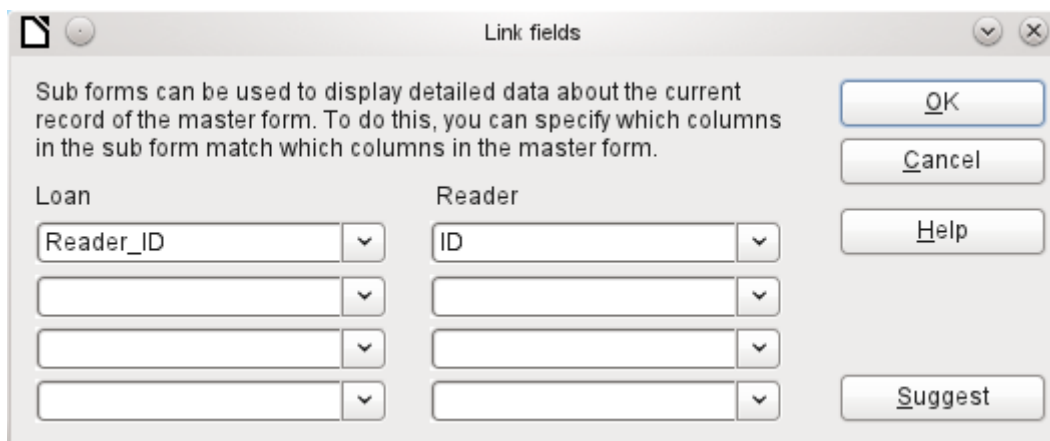


The properties of the subform must now be set up to give it the right data source, in order to reproduce the data for the correct reader.



The Loans table is chosen for the subform. For the filter we specify that the Return date field should be empty ("**Return_Date**" **IS NULL**). This prevents any media that have already been returned from appearing. The records should be sorted by loan date. The ascending sort shows the medium on loan for the longest period at the top.

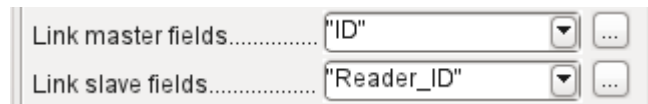
Link master fields and *Link slave fields* are used to create a linkage to the main form, in which the subform lies. The button with three dots shows once again that a helpful dialog is available for creating these.



Under *Loans*, the fields in the Loans table are shown, under *Readers* those of the Reader table. The *Reader_ID* from *Loans* should be set as equivalent to the *ID* from the *Reader* table.

Although this linkage has already been created in the database using **Tools > Relationships** (see Chapter 3, Tables), the function that lies behind the Suggest button in this dialog does not reference this and would suggest that the first foreign key in the Loan table, namely *Media_ID*,

should be linked with *ID* from the Reader table. The Form Creation Wizard solves this better by reading the relation from the relationship of the database.



The chosen link between the table for the subform and the table for the main form is now specified in terms of fields from the tables.

To create a table control for the main form, we must now select the main form in the Form Navigator. Then, if the Table Control Wizard is enabled, it will show the fields available in the main form. We deal with the subform in a similar way.

Once the table controls have been set up, we need to carry out the modifications already discussed when creating the simpler form:

- Replacing the numeric field *Media_ID* in the subform with a list box.
- Renaming the *Media_ID* field *Media*.
- Modifying the numeric fields to a format without decimal places.
- Limiting the minimum and maximum values.
- Renaming other fields, to save space or to add non-ASCII characters which should not be used in field names in database tables.

Sort and filter functions are supplemented for the main form by adding a navigation bar. The other fields on the navigation bar are not needed, as they are mostly available from the table control (record display, record navigation) or else carried out by movement through the table control (data storage).

The final form might look like the figure below.

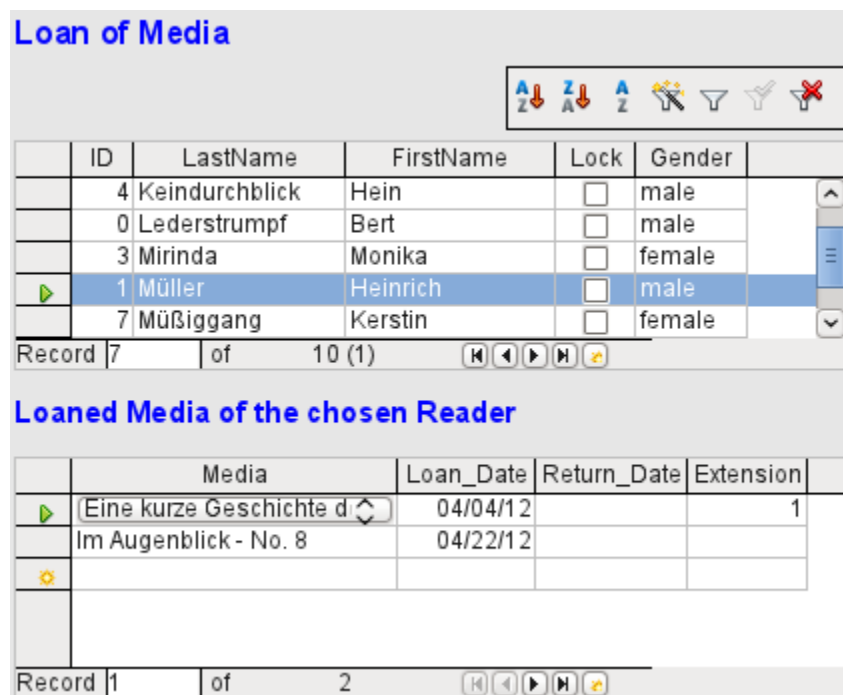


Figure 18: Form consisting of a main form (above) and a subform (below).

If a reader is now selected in the main form, the subform will show the media on loan to that reader. When an item is returned, it continues to appear on the form until the form itself is refreshed. This occurs automatically when another record is loaded into the main form. If the original reader is selected again, returned media are no longer displayed.

This delayed updating is actually desirable in this case, as it allows one to inspect the media currently lying on the library counter and see at once whether these have been registered.

This form structure is significantly easier to use than the previous one with only a single form. However there are still details that can be improved:

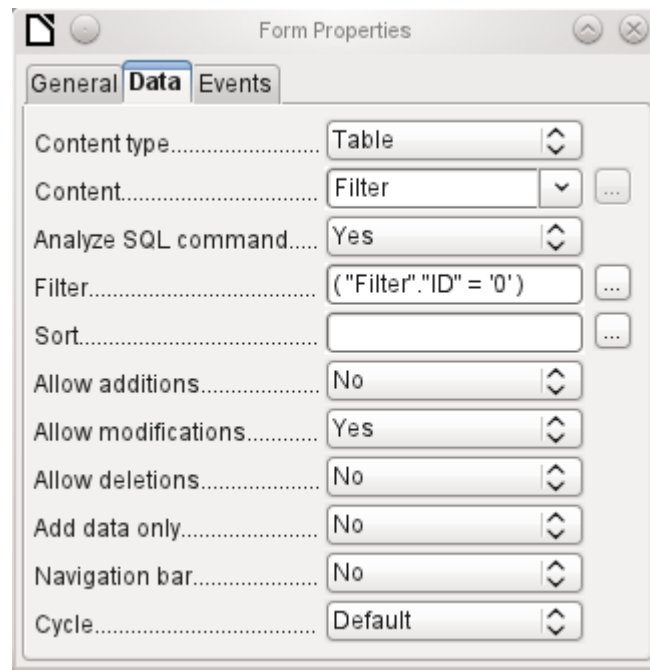
- Media and loan dates might be changed when the media is to be loaned out for longer. Changing the media date might make it impossible to trace which item is still available in the library and which is on loan. Changing the loan date could lead to errors. Recall notices could not be verified.
- If a reader record is not selected by clicking on the record header at the left, only the little green arrow on the header shows which record is currently active. It is quite possible that the active record will be scrolled right out of the table control window.
- Instead of the text "*Loaned Media of the chosen Reader*", it would be better to have the reader's name.
- It is possible to loan out the same medium twice without it having been returned.
- It is possible to delete the record for an item on loan quite easily.
- Data can be changed or deleted in the main form. This can be useful for small libraries with little public traffic. However when things become hectic at the loans counter, editing of user data should not take place at the same time as issuing loans. It would be better if new users could be registered but existing user data left untouched. For libraries, this applies equally to deletions or complete name changes.

First let us improve the selection of readers. This should protect us from changes to the loan records. A simple solution would be not to allow any modification except the entry of new records. This still requires a search function when a reader wishes to borrow an item. It would be better to use a list box to find the reader and carry out the issue and return operations in separate table controls.

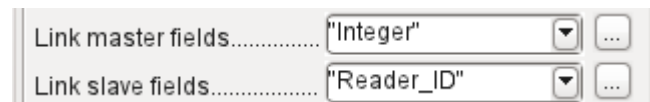
For the main form we need a table, into which the list box can write a value linked to this table. The table requires an integer field and a primary key. It will always contain only one record, so the primary key field ID can safely be declared as Tiny Integer. The following table named Filter should therefore be created.

Table name: Filter	
Field name	Field type
ID	Tiny Integer, Primary key
Integer	Integer

The table is given a primary key with the value 0. This record will be repeatedly read and rewritten by the main form.

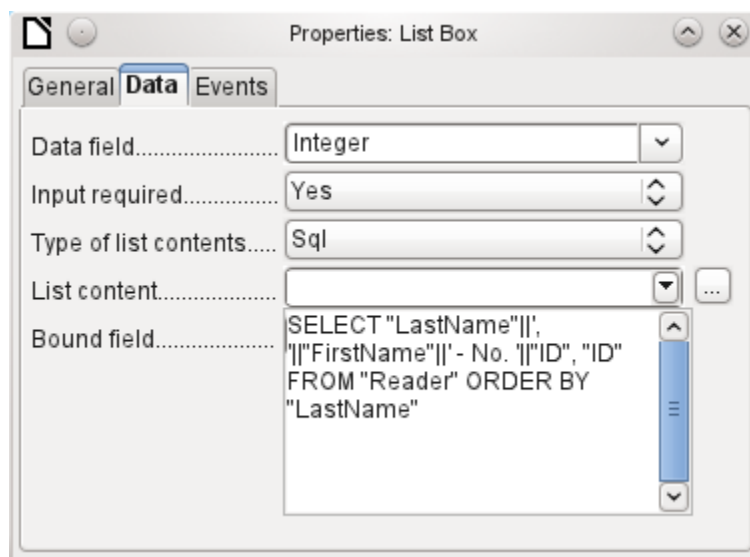


The main form is based on the Filter table. It will just read the value from the table which is associated with the primary key (*ID*) of 0. No data will be added; the current record will just be repeatedly rewritten. As only edits of a single record are allowed, a navigation bar would be superfluous.



This main form is linked to the subform in such a way that the value of the Integer field in the Filter table is the same as the value of the *Reader_ID* field in the Loan Table. The subform's properties are unchanged from the version shown above.

Before we create a list box in the main form, we must switch off the wizards. The list box Wizard only allows you to create a box that shows the content of a single field; it would be impossible to have surname and given name and an additional number in the display area of a list box. As in the simpler form, we now enter for the list box contents *Surname, Given name – ID Nr*. The list box transmits the ID to the underlying table.



Next to the list box, a button is created. This button is actually part of the subform. It takes over two functions: saving the record in the main form and updating the table in the subform. It is good enough to entrust the update to the button in the subform. The save process for the modified main form is then carried out automatically.

The button can simply be labeled *OK*. The action assigned to it in the general properties of the button is *Refresh Form*.

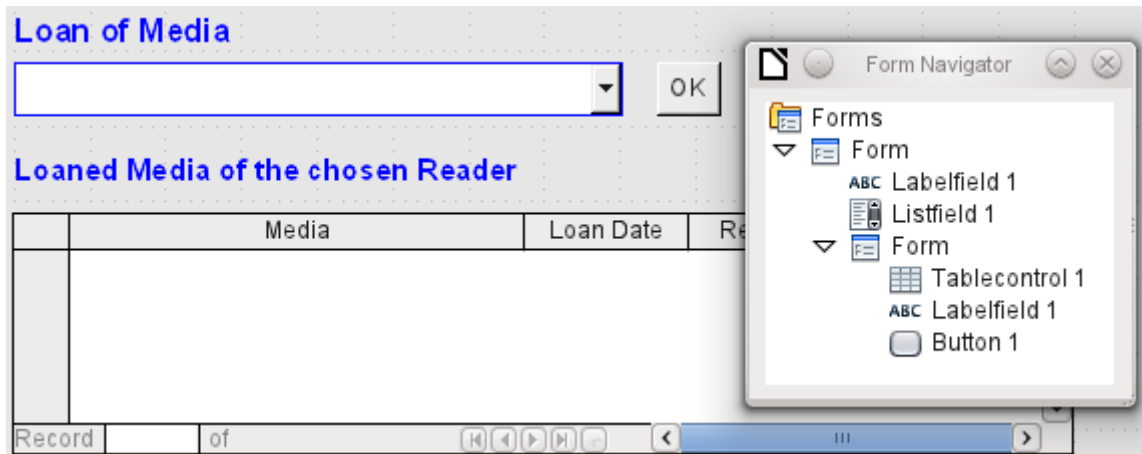


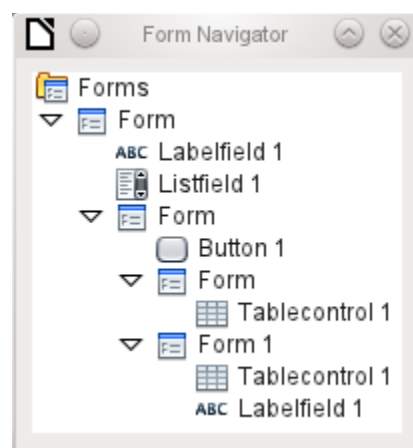
Figure 19: Main form as a filter for a subform

The main form consists only of the heading and the list box; the subform contains another heading, the table control from the previous version and the button.

The form now functions better in that:

- No reader can now be edited, altered or deleted, and
- Readers can be found more quickly by typing into the control than by using a filter.

For a greater degree of functionality (returns without alteration of previous data) a second subform must be created, linked to the same Loans table. To ensure the functionality of the list box in Figure 19, both subforms must be placed one level further down, as subforms of a subform. Data is updated hierarchically from the main form down through the subforms. The button in the previously described form must now be placed in the first subform and not in the two subforms that come under it.



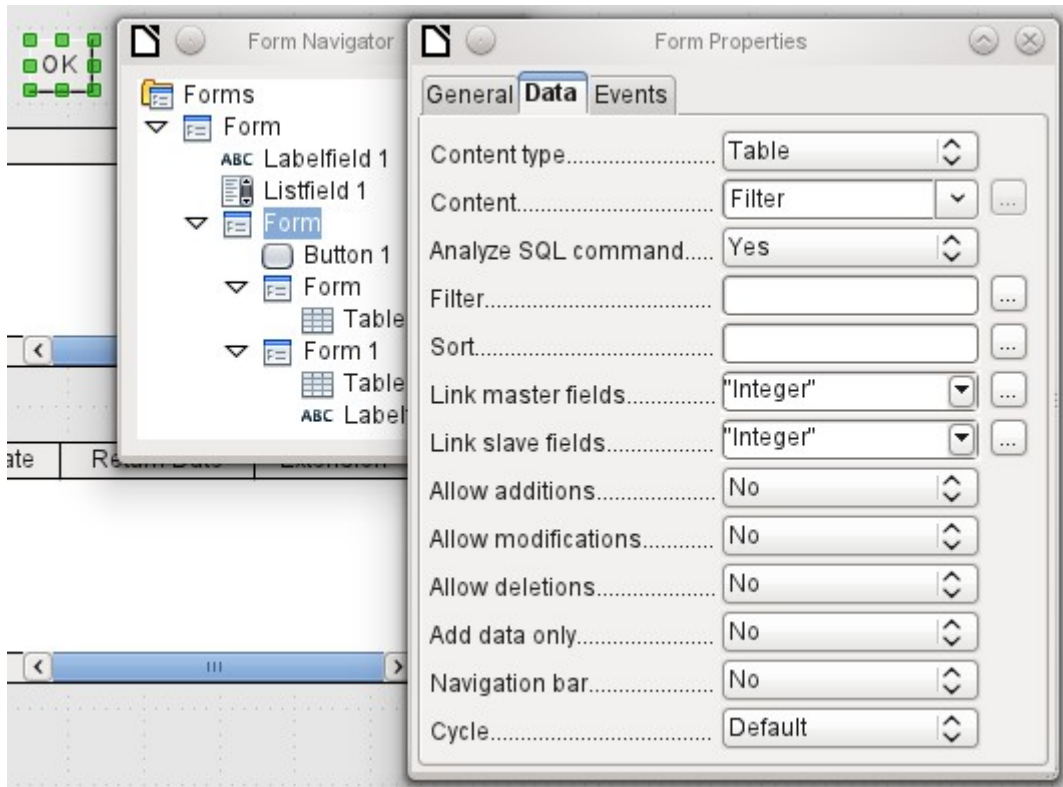
Here the Form Navigator is used to show the different levels. In the main form we have the text field for the form title and the list box for finding the reader. The list box appears at the bottom of the form, as it is declared after the subform. Unfortunately this display sequence cannot be altered. The subform has only one button, for updating its contents and at the same time saving the main

form. One level further down are the two additional subforms. These are given different names when created so that no confusion arises in any level of the tree.

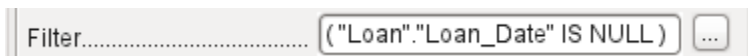
Note

Basically the names of forms and controls are without significance. However if these names are to be accessed by macros, they must be distinguishable. You cannot distinguish identical names at the same level.

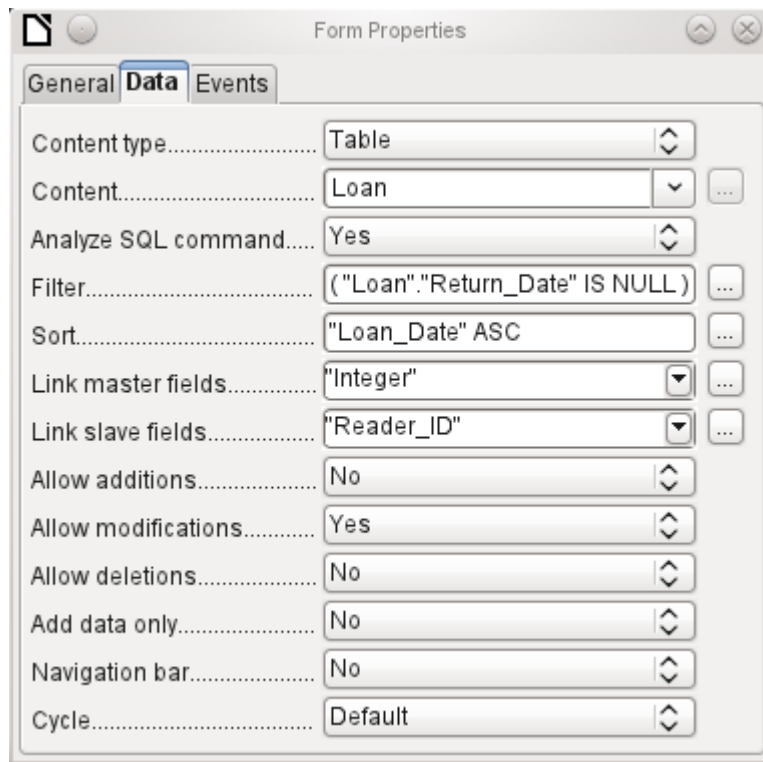
Naturally it makes sense, when creating larger form structures to have meaningful names for forms and their controls. Otherwise finding the right field could quickly become problematic.



The main form and the subform use the same table. In the subform, no data are entered. That is why all the fields for this form are set to *No*. The main form and the subform are linked through the field, whose value is to be transmitted to the sub-subforms: the Integer field in the Filter table.



In the first sub-subform, no existing data are displayed; it is used only for creating new data. For this, the suggested filter is adequate. Only records matching the *Reader_ID* and with an empty loan date field (*\"Loan_Date\" IS NULL*) will be displayed. In practice, this means an empty table control. As the table control is not continuously updated, newly loaned media will remain within it until the *OK* update button is used either to select a new name or to transfer the data into the second sub-subform.



The second sub-subform requires more settings. This form too contains data from the "Loans" table. Here the data is filtered for an empty return date. (*"Return_Date" IS NULL*). The data are sorted as in the previous form, so that the media on loan for the longest time are immediately visible.

The following points are also important. Old records can be changed, but no new records can be added. Deletion is also impossible. This is the first necessary step to prevent loan records from being simply deleted later on. But it would still be possible to change the medium and the loan date. Therefore the properties of the columns will require adjustment. Eventually the medium and the loan date should be displayed but protected from modification.

The table control is simply duplicated after the creation of the form. This is done by selecting it, copying, deselecting, and then pasting it in from the clipboard. The copy will be at the same position as the original, and will therefore need to be dragged away. After that, both table controls can be edited separately. The table control for the media return can be left practically the same. Only the write access for the *Media* and *Loan date* columns need to be changed.

While for the Loan date it is only necessary to choose *Read only*, this is not sufficient for list boxes. This setting does not prevent the list box from being used to make changes. However if *Enabled* is set to *No*, a choice cannot be made there. A list box contained within the table control is then displayed as a read-only text field.

In the above table control, all fields that have nothing to do with the loan are removed. Only the medium as a selection field and the loan date *Loan_Date* remain.

If finally the query for the list box in the upper table control is selected, only those media are displayed which can actually be loaned out. More about this is in Chapter 5, Queries.

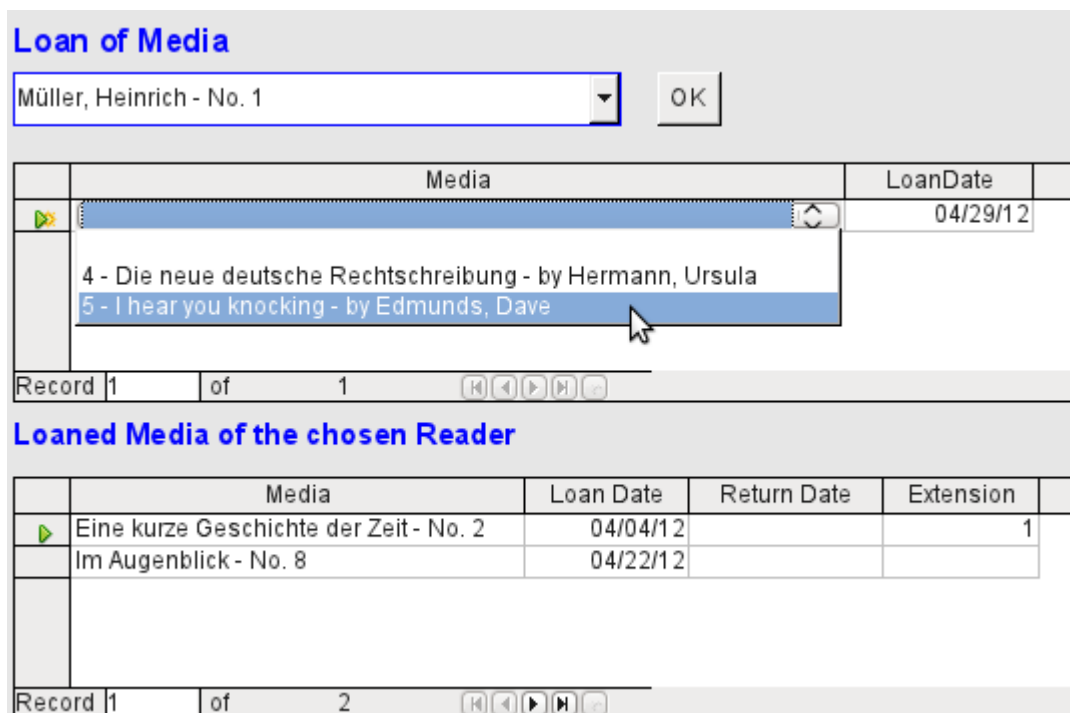
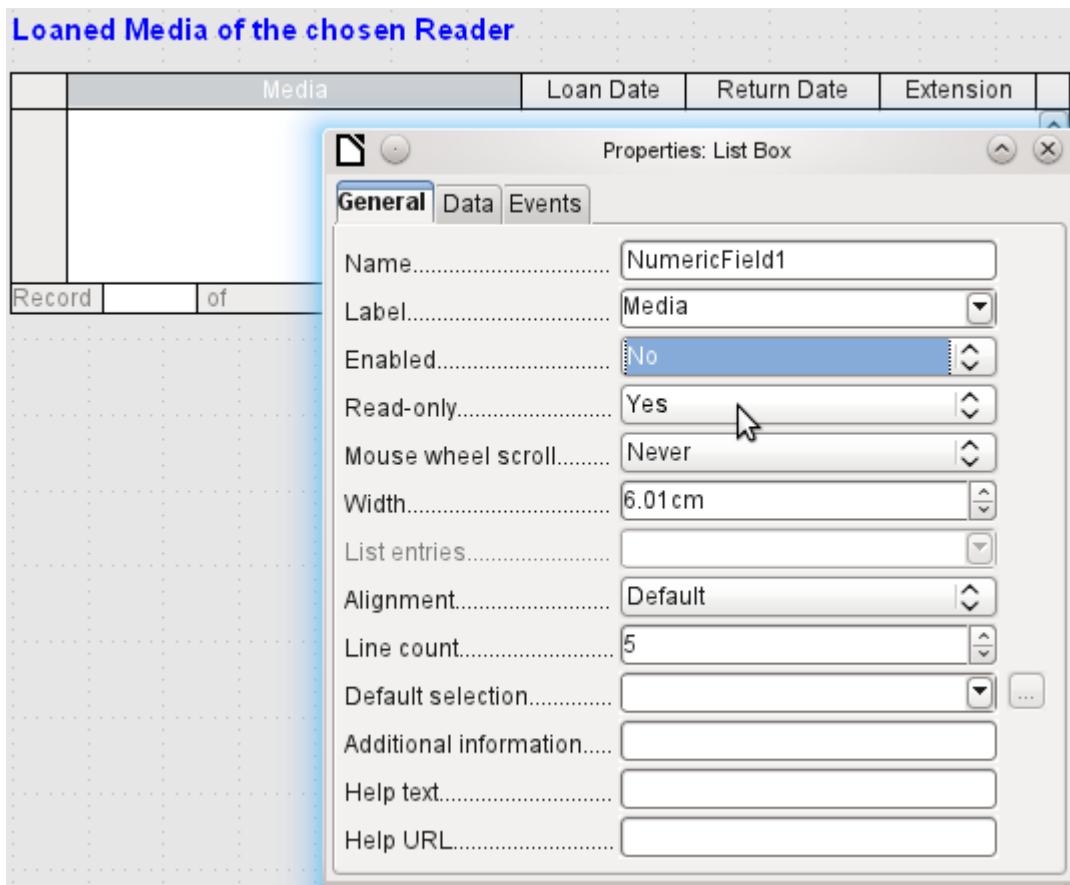
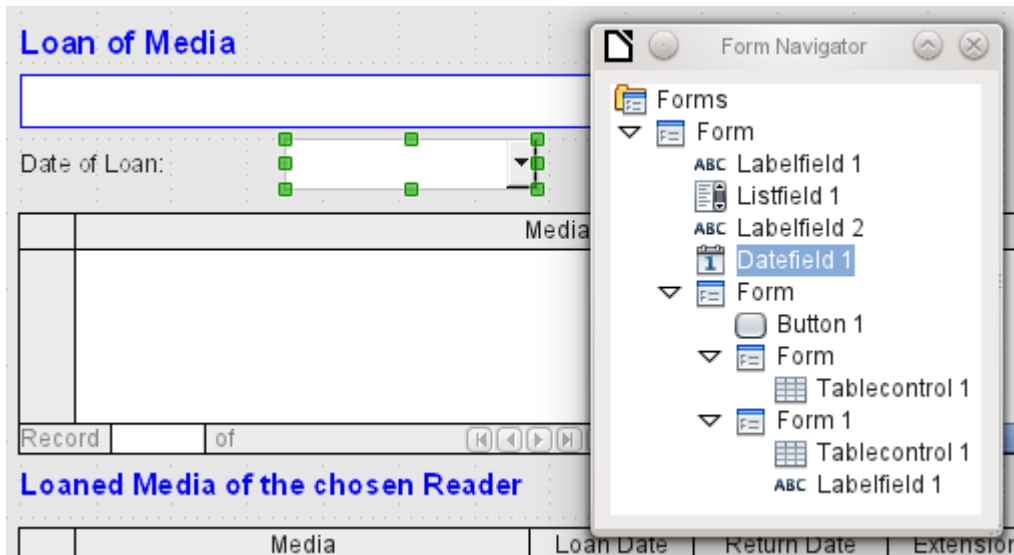


Figure 20: The selection field in the upper subform shows only media that are not on loan.

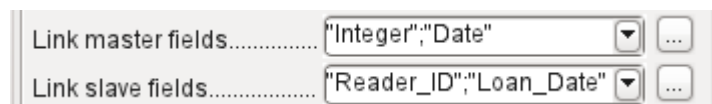
The media loan form is already significantly more useful. When a reader arrives at the loan counter, his or her name is searched. The media to be loaned can be selected using the list box and the loan date entered. The *Tab* key then takes you to the next record.

A final improvement is also desirable: at present the loan date must be selected each time. Imagine a day in the library with perhaps 200 loan transactions, perhaps just one person, who has to loan out about 10 media each time. That would require the same entry for the date field over and over again. There must be a way to simplify this.

Our main form is linked to the Filter table. The main form works only with the record that has as its primary key the "ID" 0. But additional fields can be built into the Filter table. At present there is no field that can store a date, but we can easily create a new field with the field name Date and the field type *Date*. In the Filter table we now have stored not only the *Reader_ID* ("Filter"."Integer") but also the *Loan_Date* ("Filter"."Date").



In the main form, an additional date field appears, along with a label referring to its content. The value from the date field is stored in the Filter table and transferred by the linkages from subform to sub-subform.



The linkage between the two forms now refers to two fields. The *Integer* field is bound to the *Reader_ID* field of the sub-subform. The *Date* field is bound to the *Loan_Date* field. This ensures that the *Loan_Date* is automatically transferred from the Filter table to the Loans table when the loan is made.

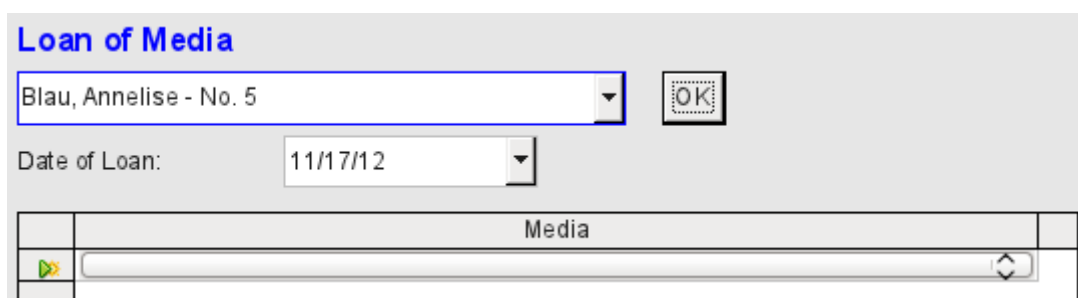


Figure 21: The date of the loan is entered only once. When the Reader changes, it must be reentered.

The date field is now removed from the table control, so that the latter contains only one search field. This would be the ideal requirement for speeding up even more the work of the library. For in fact each medium will have a printed accession number, so why does that have to be searched?

You can just enter the number directly. Or, better still, it could be scanned in with a barcode reader. Then media can be loaned as rapidly as the borrower can stow them in his bag.

This is illustrated in the example database. The above example should suffice for understanding the initial form design but, as the example database, `Media_without_Macros.odt`, develops the form further, the extra refinements are briefly presented below.

Loan

First Name	Last Name	ID
Annelise	Blau	5
Greta	Garbo	6
Lisa	Gerd	2
Hein	Keindurchblick	4
Bert	Lederstrumpf	0
Mirinda	Mirinda	3

Record 3 of 10 (1)

Filter (Last Name)

Record 3 of 10

Loan for Reader Gerd, Lisa

Loan Date:

current Loan

Medium	Loan Date
1 - Das sogenannte Böse - by Lorenz, Konrad	11/17/12

Record 1 of 1

Return

Medium	Loan Date	Return Date	Extension	Loan Days	Balance Time
6 - Datenbanken mit OpenOffice.org 3 - by ?	11/07/12			10 Days	4 Days

Record 1 of 1

The Loan form shows the following properties:

- Readers are displayed in a table control. Here you can also enter new readers.
- Using a filter, linked to the Filter table, names can be filtered using their initial letter. So, if you enter A, only people whose surname begins with A will be displayed. This filtering is case-independent.
- The subtitle shows again the name of the person to whom the loan is to be made. If a lock has been placed on this borrower, this is also displayed.
- The loan date is set to the current date. This is done in the filter table using SQL such that, when no date is entered, the default value to be stored is the current date.
- Loanable media are selected using a list box. When the Update button is pressed, the loan is transferred to the table control below.
- The table control in the middle serves only to display the actual date of loan for the media. Here it is also possible to correct an error retrospectively by deleting the line.

- In the lower table control, as in the above example, alteration of media and loan dates is not possible. Nor is it possible to delete records.
- Apart from the entry of the return date or, if appropriate, an extension of the loan, this table also displays the number of days for which the medium can be loaned and how many days remain of the current loan period.
- If this remaining time becomes negative, the medium must be returned immediately. The issue is then locked. It becomes possible again only when the medium is returned. After the return, the Update button need only be pressed once.

This form, made by using queries, is significantly more complex in its structure than the previously shown version. You can learn more about the essentials of this in Chapter 5, Queries.

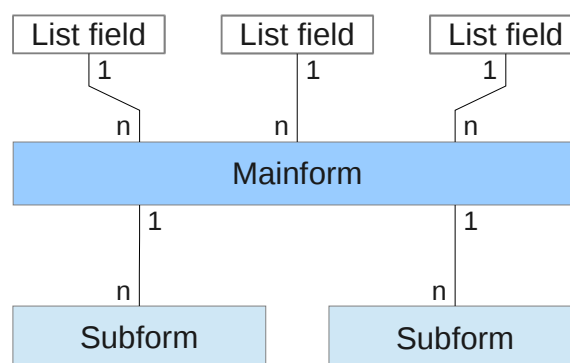
One view – many forms

While the example for the Loans form only involves entries into one table (the Loans table) and additionally allows entry into the simpler form for new readers, the entry procedure for media is significantly more extensive. In its final form, the media table is surrounded by a total of eight additional tables (see Chapter 3, Tables).

The Subtitle and rel_Media_author tables are linked to subforms of the Media form through a n:1 relationship. By contrast, tables with a 1:n relationship to the Media table should be represented by forms that lie above the Media table. As there are several such tables, their values are entered into the main form using list boxes.

The table of a main form stands to the table of a subform in a 1:n relationship, or in some exceptional cases 1:1. Therefore, after long use of the database, the main form usually manages a table which has significantly fewer records in it than the table belonging to the subform.

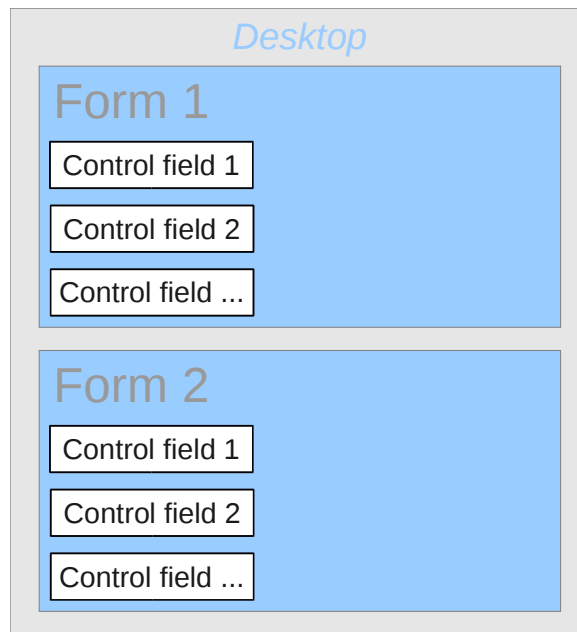
Multiple main forms cannot include the same subform. Therefore it is not possible to create a form arrangement for many simultaneous 1:n relationships in which the subform has the same content. When there is a 1:n relationship for the table belonging to a form, you can use a list box. Here there are only a few terms available from another table, those whose foreign keys can be entered into the main form's table in this way.



Using list boxes, the main form based on the Media table can be assigned values from the Category, Town or Publisher tables. Subforms are used to link the rel_Media_Author and Subtitle tables with the main form and through it with the Media table.

The subform for the rel_Media_Author table again consists of two list boxes so that the foreign keys from the Authors and Author_Add_ID (additions might be for example editor, photographer, and so on) do not have to be entered directly as numbers.

For the media entry form, the list boxes usually have to be filled up gradually during the entry process. For this purpose, further forms are built in alongside the main form. They exist independently of the main form.




The overall form for entering media looks like this:

Media - Input and Searching

Searchitem

ID: Title:

Category: Mediastyle:

Town: Publisher: Pub-Year: Edition: Price [€]: Picture: 

Author Sort.	Author	Author Add	ISBN/ISSN
1	van Veen, Herman		

Record 1 of 1

No	Subtitle	Length
1	Amsterdam	
2	Hier unten am Deich	
3	Köln-Ehrenfeld	
4	Bei mir	
5	Gott sei Dank	

Record 1 of 5

Comment:

Editing Content of Listfields

Category	Description
Fantasy	
Liedermache	
Rock	

Record 1 of 3

Mediastyle	Loantime
Buch	14 Days
CD	7 Days
DVD	7 Days

Record 1 of 3

Town
Dresden
Hamburg
Nürnberg
Pusemuckel

Record 1 of 4

Publisher

Record 1 of 1

First Name Author	Last Name Author
Dave	Edmunds
Dr. Lutz	Götze
Steven W.	Hawking
Dr. Klaus	Heller

Record 1 of 10

Author Add
Geleitwort
Hrsg.
Illustration
überarbeitet

Record 1 of 4

On the left side is the main form with a view to searching and entry of new media. On the right side of the form is a group box with the label *Edit list box contents*, providing a separate area intended for filling up the list boxes in the main form. If the database has not existed for long, it will often be necessary to make entries into these fields. However, the more entries that are available for the list boxes of the main form, the less often will access to the table controls in the group box be necessary.

The following table controls are all subordinated as individual side forms to the main form, the entry form.

Editing Content of Listfields

	Category	Description	
▶	Fantasy		
	Liedermache		
	Rock		
⊙			

Record 1 of 3

	Mediastyle	Loantime	
▶	Buch	14 Days	
	CD	7 Days	
	DVD	7 Days	
⊙			

Record 1 of 3

	Town	
▶	Dresden	
	Hamburg	
	Nürnberg	
	Pusemuckel	

Record 1 of 4

	Publisher	
▶		

Record 1 of 1

	First Name Author	Last Name Author	
▶	Dave	Edmunds	
	Dr. Lutz	Götze	
	Steven W.	Hawking	
	Dr. Klaus	Heller	

Record 1 of 10

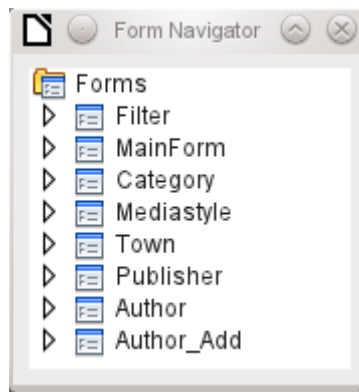
	Author Add	
▶	Geleitwort	
	Hrsg.	
	Illustration	
	überarbeitet	

Record 1 of 4

Here in each case the complete data for a table are entered. In the early stages, it is often necessary to have recourse to these side forms, since not many authors are yet stored in the corresponding table.

When a new record is stored in one of the table controls, it is necessary to find the corresponding list box in the main form and use the Update control (see Navigation bar) to read in the new values.

The Form Navigator shows a correspondingly large list of forms.



The forms have been individually named to aid recognition. Only the main form still has the name of *MainForm* given to it by the Wizard. Altogether there are eight parallel forms. The *Filter* form hosts a search function while the *MainForm* form is the main input interface. All the other forms relate to one or other of the table controls shown above.

Without the table controls, the main form looks somewhat simpler.

Media - Input and Searching

Searchitem

ID: Title:

Category: Mediastyle:

Town: Publisher: Pub-Year: Edition: Price [€]: Picture:

	Author Sort.	Author	Author Add	ISBN/ISSN
<input type="checkbox"/>	1	van Veen, Herman		<input type="text"/>
<input type="checkbox"/>				
<input type="checkbox"/>				

Record 1 of 1

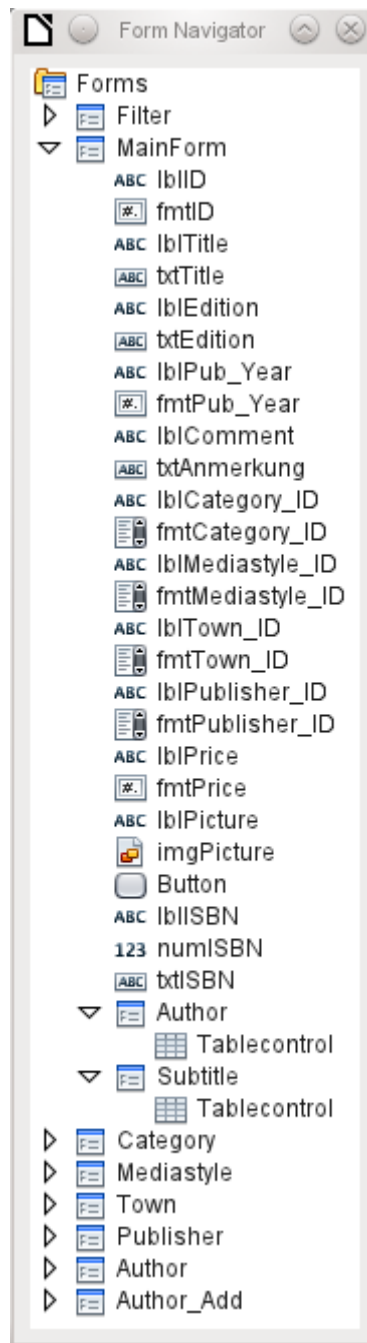
	No	Subtitle	Length
<input type="checkbox"/>	1	Amsterdam	
<input type="checkbox"/>	2	Hier unten am Deich	
<input type="checkbox"/>	3	Köln-Ehrenfeld	
<input type="checkbox"/>	4	Bei Mir	
<input type="checkbox"/>	5	Gott sei Dank	

Record 1 of 5

Comment:

The field for the search term lies in the *Filter* form, the two *table controls* (for the author and the subtitle) lie in the *subform* of the Media Entry main form.

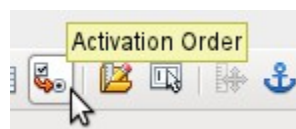
In the Form Navigator, this form looks much more complex, as all the controls and labels appear there. In the previous form, most of the fields were actually columns within the table controls and were thus invisible to the Form Navigator.



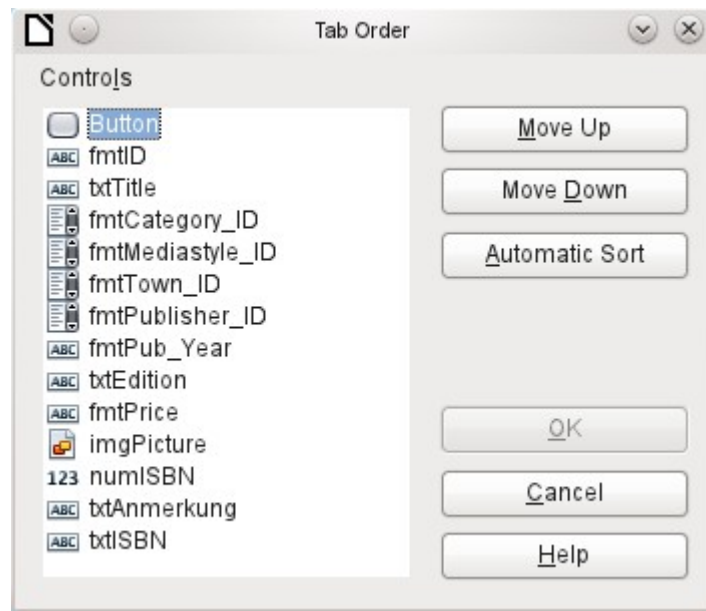
Unfortunately the sequence within the Form Navigator cannot easily be changed. So, for example, it would seem more sensible to place the subforms *Subtitle* and *Author* as branches of *MainForm* right at the beginning. But within the Form Navigator, individual controls and subforms are simply shown in the order in which they were created.

The Form Wizard provides the controls with particular abbreviations which appear next to the icons and indicate what type of control this is. Labels begin with 'lbl', text fields with 'txt' and so on. Altogether labels provide only secondary information for data entry. They can also be placed directly above text frames and then do not appear in the Form Navigator.

The sequence of the elements in the navigator has nothing to do with the tab sequence. That is determined by the *Activation Order*.



The activation sequence for a particular form is invoked, when an element of the form is selected and then the *Activation sequence* button is clicked. For a simple form, it is not necessary to do things in this order, but where there are many parallel forms, the function needs to know which form is intended. Otherwise, by default, it is the first form in the Form Navigator. In the above example, this contains only a single text field.



The activation sequence allows all the elements that transmit data to the underlying table of the form or can carry out actions, to be put in order. This corresponds to setting the activation sequence in the control properties listed on page 12.

Note that in the activation sequence, some controls appear for which the tab stop is actually switched off. They are included in the list, but are not in fact accessed through the keyboard when working with the form.

Fields can be automatically sorted in the order in which they appear on the form background. The higher up a field lies, the earlier it comes in the sequence when you use *Automatic Sort*. For fields at the same height, the leftmost field comes first. This sorting functions without error only when the elements were exactly positioned using the grid when the form was created. Otherwise you will need to adjust them. Simply select a control and use *Move Up* or *Move Down* to move it higher or lower in the sequence.

If there is a subform, *Automatic Sort* jumps directly into the subform after completing the main form. In the case of a table control, this causes the cursor during keyboard input to be trapped within this subform; you can only free it by using the mouse or by pressing *Ctrl+Tab*.

The *Automatic Sort* functions only once for a table control. A subsequent subform with a table control will not be included. Parallel forms are not taken into account either. An *Automatic Sort* cannot be made retrospectively for a subform with a table control. The subform must be completely removed (temporarily moved to another form).



The data substrate for the form for media entry is in this case not a table but a query. This is necessary as the form is to be used not just for entering records but also for searching. The form also contains a text field which shows, after saving, whether the ISBN number entered was correct. This too is only possible using a comprehensive query. To understand the background of this, it is therefore necessary to discuss the fundamentals of queries, covered in Chapter 5.