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SOFTWARE PRODUCT

GEOINFORMATION SYSTEM «PANORAMA»
(GIS Panorama)

Applied tasks. Database. Part 2

PARB.00046-04 98 15

45 pages

2017

ANNOTATION

This document contains a manual for working with databases during the operation of the Geoinformation system «Panorama» (GIS Panorama) PARB.00046-04.

GIS Panorama is a universal geoinformation system that has the tools for creating and editing digital maps and city plans, processing remote sensing data, performing various measurements and calculations, overlay operations, building 3D models, processing raster data, and preparing graphic documents in electronic and hard copy format, as well as tools for working with databases.

This document will help the user to master the software product Geoinformation system «Panorama» (GIS Panorama) PARB.00046-04, assess the opportunities.

CONTENTS

1 FORM CONSTRUCTOR

Form constructor is the constituent of the software Geoinformation system «Panorama» (GIS Panorama) PARB.00046-04 (hereinafter – GIS Panorama) and it is intended for creation and editing of the user forms, which provide more comfortable operation for the user with tables of database. Previously, «DB Administrator» in bookmark «Data sources», it is defined a set of available tables for « Database project».

This form constructor has «Toolbar» with a palette of components and «Menu panel».

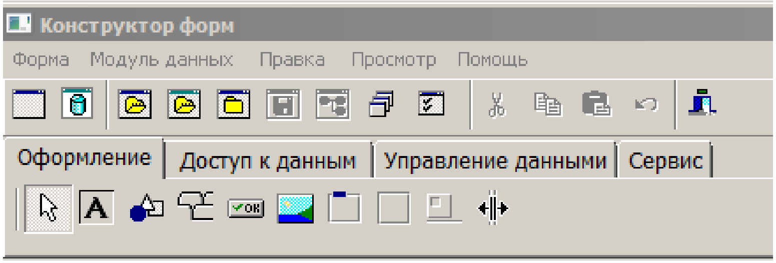


Figure 1 - Form constructor

1.1 Main concepts

The application's interface consists of components that the user selects from «Palette of components», and it places them on the form, the components themselves are some kind of building blocks. When constructing the application interface, it is applied the principle of WYSIWYG («what you see is what you get»), and the user sees the form when creating the application almost the same as when it will be executed.

Components are structural units and they are divided into visual (visible) and non-visual (system) ones.

To create the interface of application, it is offered a set of visual and non-visual components, which are located on the tabs «Design» (Common – Appearance – General), «Data access», «Data control», «Service».

On the tab «Design» (Common) for the components of palette, there are the following visual components: «Text», «Shape», «Bookmarks», «Button», «Image», «Frame», «Panel», «Bevel», «Splitter».

On the tab «Data access» for the components of palette contains non-visual components that serve to organize access to the data contained in the tables. They represent an intermediate link between database table data and visual components: «ADO connection», «ADO table», «ADO query», «Parameterized query», «Table dBase».

On the tab «Data control» for the components of palette contains the visual components that are used to create the interface part of the application. With their help, the user can perform such operations with database tables, as viewing or editing data. Consider the following visual components: DB String, DB Memo-field, DB Image, DB Text, DB List, DB Logical field, DB Dropdown list-classifier, DB List-classifier, DB List of indexes, DB Grid, DB Grid objects, DB Navigator, DB Panel of records editing, Chart (Diagram), Calculator, Operator selection, DB Date/Time, DB Line with mask, Date/Time, Line with mask, Switch.

The tab «Service» for the components of Palette contains the components «Saving a query to a table», «Working panel» and «List of macroses».

1.2 Form is the main component of the application

The most important visual component is «Form». «Forms» represent visible windows of Windows OS, and they are the central part of any application. Visual and non-visual components are placed on

«Form». Thus, «Form» is a component serving as a container for all other components. Creating the interface in «Form constructor» begins with the fact that the user should add «Form» in the empty «Form» window (in the menu «Form» item «New» or with the button «Create new form» on the «Main panel» of the constructor).

The typical form represents the rectangular window with a framework. The most of windows contains the title bar where are arranged a header icon, header and a number of buttons permitting to fold, to unfold (to restore) and to close window.

Forms which display the different messages and require from user the input of any information often are named as dialogs.

As well as any other components, the form has following properties: «Color», «Height», «Indent from the left», «Indent from the top», «Width», «Active dataset name», «Name», «Caption».

«Active dataset name» is the pointer onto an active dataset from the list of datasets on the form (such components as «Table» and «Query»). By default, it is installed on the first set of data type «Table». The property is intended to determine the data set by which the form is connected with a map.

«Name» contains a component name (identifier), under which one «Form» will be recorded in «DB Administrator».

«Caption» contains string for inscription of the component header. Initially it gets its value from the «Name» property.

The newly created form is saved by placing it in the project form tree (the button «Save new form to the project form tree»). Save forms after editing is done by clicking on the button «Save form». A copy of the form opened onto editing can be saved in any place of a tree for the forms.

2 OPERATING IN FORMS EDITOR

At creation of the application interface for each component the following operations are executed:

- Choice of the component in «Palette of components» or in menu item «Change/Add» and placing it on the form;
- Change of the component properties.

The developer performs these operations in the window «Form constructor» using «Palette of components» and «Inspector of object properties». In this case, the developer's actions are similar to operation in the environment of the graphics editor, and creation process of the application interface more reminds the designing or drawing.

Select a component in «Palette» by clicking on the desired component, for example, «Button», as a result of which its icon takes a recessed view. If then to click on an empty place on the form, the selected component appears on it, and its icon in «Palette» takes the usual form. Component icons reflect the purpose of the components, in addition, when you hover over each component of the mouse pointer, a hint about its purpose is displayed.

After placing the components in a form, you can adapt them to your needs and tasks. Components can be moved, aligned, enlarged or reduced in size, and edited by their properties. Note that the component to which you want to make changes must be highlighted.

To search, view and change the properties of the form element, there is «Object Inspector» that can be called through the menu item «View/Object Properties» or by pressing the key «F11».

2.1 Allocating components

The component is considered to be marked when small squares of black color appear on its sides – allocation markers. The marking is done by clicking on the component in the form. Allocation of the form itself is similar, but in the selected state the form is not allocated with markers. To allocate (select) a form, just click anywhere in its place, free from other components.

A group selection of components is allowed, while for the selected group in «Object Inspector», it is possible to edit the same properties.

Group selection of components is done by selecting each component with the key «Shift» pressed by the mouse, or you need to place the cursor on the form field, press the left mouse button and, holding it, stretch the «rubber» rectangle. All objects that fall inside and on the boundaries of this rectangle will be highlighted. In this case, gray scale markers will appear around each component in the group. Repeated selection of the component with the key «Shift» pressed removes the allocation from this object, not destroying group choice of remaining components.

To deselect the component or the group of components, click the right mouse button within the selected group, or select another component.

The component can be selected even if it is closed from above by other components. To do this, simply click the mouse where you want it to be. Another way to highlight components, it is through the list of form components, in «Object Property Inspector».

2.2 Grouping

The form can contain components that are containers for other components. This means that if to displace the component – container, then the components contained in it will be displaced too. Containers include such components as «Frame», «Panel», «Bookmarks». The meaning and purpose of the container is that the components contained in it can be considered as a unit. At deleting of the container, all components contained in it are also deleted.

2.3 Alignment

It is possible to change the position of objects on the form:

- by moving the allocated objects with the mouse;
- by setting the appropriate parameters in «Object Inspector»;
- by using specialized alignment functions for allocated objects (in the main panel, the button group «Align»).

2.4 Resizing

It is possible to resize the marked object also with the help of the mouse. For this purpose it is necessary to displace scaling markers.

By indicating parameters in appropriate properties of «Object inspector», it is possible to set sizes of components more precisely.

2.5 Removing components from form

For deleting a component it is necessary to mark (to select) the necessary component (group of component) and to select «Delete» on the main panel, or menu item «Edit/Delete», or press the key «Del».

2.6 Editing components: changing property values

The properties represent attributes that determine the way that components are displayed and operated when the application runs. Each component, in «Palette of components», has default property values. Once the component is placed in the form, its properties can be changed. For this purpose, it is used «Object property inspector».

3 INSPECTOR OF OBJECTS' PROPERTIES

«Object property inspector» displays information about the current (selected) component and when designing the form, it makes it convenient and easy to change many properties of components.

The window «Object property inspector» after starting «Form constructor», it is located under «Main panel» of the constructor on the right side of the screen, and it displays the properties of objects for the current form. This window can be displayed on the screen with the command «View/Object Properties» or by pressing the key «F11».

The user can change the position on the screen and the sizes of «Inspector» arbitrarily.

At the top of «Inspector», it is an object selection field that shows which component is currently active. If to click in the object selection field, a list appears containing the names of all the placed components on the edited form (including the form itself). At the same time, the name (the proper name) of the component is displayed first, and after the colon its type.

The list for components of the form is intended for the operative selection of the component on the form. At the selection of a component in the list, it is highlighted on the form, and the inspector displays a set of its properties. This method of choice is useful in cases where the component is completely closed by other objects.

The left part of the window «Object Inspector» lists the names of all component properties that are available during the development phase of the application. For each property on the right, the value of this property is contained.

To set property values in «Inspector», it is used the property editors that connect automatically during operation with some properties:

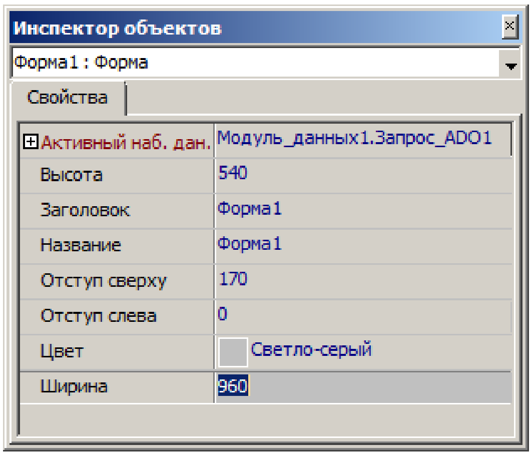
- Simple;
- Enumerable;
- Multiple;
- Object.

Simple – value of property is entered or edited as usual string of characters. It is used for such properties as «Name», «Caption», «Width», «Height».

Enumerable – value of property is selected from the drop-down list. The list is opened after clicking on the arrow that appears when the property is activated. It is used for such properties as «3D Effect», «Show hint», «Read only».

Multiple – value of property is a combination of values from the proposed set. The object inspector to the left of the name for the multiple-type property contains the sign «+». The property value is created using an additional list, which is expanded by double clicking on the property name. This list contains a list of all valid values for the property, to the right of each value it is possible to specify «Yes» or «No». It is used for properties such as «Display of Button», «Options».

Object – property is the object, and in turn, contains other properties (sub-properties), each of which can be edited separately. It is used for such properties as «Bookmarks», «Font», «Caption font». The type of the object is indicated in brackets in the value field of property – object, for example, «Bookmarks» or «Font». There can be contained sign «+» to the left of a name for the property – object. In this case the control of its sub-properties is done as well as for property of a multiple type through a drop-down list. This list contains in the left part a sub-properties name, and in dextral – values edited by usual way. The button with three points can be displayed in the value field. It means that for this property there is a special editor, which is called by pressing this button. So, for the property «Font», it is opened the standard window of Windows OS for settings of font parameters.



Инспектор объектов

Форма1 : Форма

Свойства

⊞Активный наб. дан.	Модуль_данных1.Запрос_ADO1
Высота	540
Заголовок	Форма1
Название	Форма1
Отступ сверху	170
Отступ слева	0
Цвет	□ Светло-серый
Ширина	960

Figure 2 - Object property inspector

4 COMPONENTS OF FORM CONSTRUCTOR

4.1 General properties of components

Properties allow you to control the appearance and behavior of components when creating and executing the application. Setting the values of most component properties, it is usually done during creation of application using «Object property inspector».

The set of component properties is fixed and depends on the component type.

The list and purpose of general and most common properties of components:

- Name;
- Caption;
- Height, Width;
- Indent left, Indent right;
- Automatic size;
- 3D Effect;
- Hint;
- Show hint;
- Color;
- Positioning.

4.1.1 Name

It contains the name (identifier) of the component that is accessed by this component. The name is formed automatically as follows: the name of the component is added with its number in the order of the room on the form. For example, the first «Button» gets the name «Button1», the second – «Button2», etc. Usually, the developer gives the components more informative names than the default names. It is advisable to include in the name data about the type of component and its purpose in the application. The name can't contain spaces, the first character must be a letter or an underscore.

4.1.2 Caption

It contains a line for writing the title of the component. Initially it gets its value from the property «Caption».

4.1.3 Height, Width

«Height», «Width» – indicate respectively the vertical and horizontal dimensions of the component.

4.1.4 Indent left, Indent right

«Indent left», «Indent right» – it defines the coordinates for the upper left corner of the component relative to the container containing it, for example, the form or panel. The properties «Height» and «Width» together with «Indent left» and «Indent right» specify the position and size of the components.

4.1.5 Automatic size

It serves to control the automatic correction of component sizes depending on the text of inscription. If the value of the property is equal «Yes», then the component changes its size according to the text contained in it, specified in the property «Caption».

4.1.6 3D Effect

It allows you to set the appearance of the visual component. If the value of the property is equal «No», then the component has a two-dimensional view, if it is equal «Yes», then the 3D view (default).

The effect of three-dimensionality (volume) is created by a deepening of the object relative to the container.

4.1.7 Hint

It specifies the prompt text displayed when the cursor is in the component area and remains motionless for a while. The toolhint is a yellow (default) color field that displays text that explains the purpose or use of the component.

4.1.8 Show hint

For displaying «Hints», it should set the property «Yes». By default, the property is set to «No», and «Prompt» is not displayed.

4.1.9 Color

It specifies the color for the background of the component. The displayed color depends on the parameters of the video card and monitor, first of all, from the installed color image. To change the color, use the standard color selection dialog.

4.1.10 Positioning

It specifies the option of aligning the component within the container in which the component is located. Most often in the role of such container appears «Form» or «Panel». Alignment is used in cases where it is required that an interface element occupies a certain position relative to the container containing it, regardless of changing the size for the last one.

A property can take one of the following values:

- No – the alignment is not used. The default component is located at the place where it was placed during the development of the application.
- On the left – the component moves to the left part of the container, the width of the component does not change, its height becomes equal to the height of the container.
- Above – the component moves to the top of the container, the height of the component does not change, its width becomes equal to the width of the container.
- On the right – similar to the action «Left», but the component moves to the right side of the container.
- Bottom – similar to the action «Above», but the component moves to the bottom of the container.
- In the window – the component occupies the entire container.
- Font – defines the font parameters used to display text. To select a font, use the standard font settings dialog.
- Border style – a way to allocate component dimensions, possible values: none, single (default).
- Read only – the ability to edit information (default is «No»).

4.2 Components of designing

To create an interface of applications, the extensive set of visual components is offered, which is located on the tab «Appearance» (design).

4.2.1 Text

«Text» is an inscription (shortcut) and it is most often used as headers for other control elements that do not have their own property «Caption». The caption can’t be edited by the user while executing the program.

Properties of the component are: Auto size, Caption, Color, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Positioning, Width.

Alignment – way of the text alignment inside a component. The property (Alignment) can accept one of the following values:

- left – aligned (the default value);
- central;
- right – aligned.

Border style – way of overall dimensions marking of the text. It is possible one of the following values:

- none (default);
- single;
- concave.

4.2.2 Shape

«Shape» is a flat geometric figure. It allows you to divide the space of the form into semantic blocks.

Properties of the component are the followings: Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Positioning, Width.

Brush – defines a pattern used for filling of geometrical figures, for example, rectangle or ellipse. It is possible to control by filling of the figures with the help of paintbrush properties, basic of which are the followings:

- Color – controls the color of a paintbrush, is selected with the help of the standard dialogue of color choice;
- Style – sets the style of a paintbrush and can receive following values: continuous (solid), clear, horizontal, vertical, diagonal (1– declinations from the left to the right and 2 – declination from the right to the left), cross, diagonal cross.

Pen – defines attributes of a pen used for drawing of boundaries of geometrical figures. The control of pen attributes is implemented through its properties, basic of which are the followings:

- Color – controls the color of a pen, it is selected with the help of the standard dialog of color choice;
- Style – indicates style of a drawing line and it can receive following values: continuous (solid) (by default), dash, dot, dash dot, clear;
- Width – sets width of a figure contour in pixels.

Changing of contour style is displayed only if the value of width is equal to 1.

Shape – defines the form of a geometrical figure and it can receive following values: a rectangle (by default), square, rounded rectangle, rounded square, ellipse, circle.

4.2.3 Page control (Bookmarks)

Page control is a command element, has some pages arranged one under other. The component is the container and it can contain other command elements.

Properties of the component are the followings: Height, Indent from the left, Name, Indent from the top, Width, Show hint, Positioning, Font.

Page control – defines quantity of bookmarks and their name and represents the list of strings used for creation of Page control. At addition of new string to the list a new bookmark automatically is created with this name.

Active bookmark – defines a selected bookmark, and together with it and active page displayed atop of other pages. At development of the application only the caption of active page is displayed as value of property.

Bookmarks style (Tab style) – sets the imaging style of a component and can receive following values: standard bookmark of volumetric style (by default), bookmark in the buttons style, bookmarks are in the style of plane buttons. If Page control looks like buttons, the component hasn't frame bounding the page. If it is necessary, the user should limit area of a control element by bookmarks. For this purpose it is possible to use the component «Panel».

Bookmarks orientation (Tab position) – defines location of pages in different places of a notebook and can receive following values: top (by default), bottom, left, right. For changing property «Tab position» it is necessary to set «Tabs» value for property «Tab style».

Multi line – defines the possibility of the bookmarks can be displayed as several lines. If the property matters «No» (by default), the bookmarks are output by one line, and if they do not find room in one line, arrows appear in a right part of the control element, by using of which the scrolling of bookmarks may be done. If the property matters «Yes», the bookmarks can be displayed in several lines.

Each bookmark represents a separate component, which name is displayed in the components names list of «Object inspector». The bookmark can represent itself as a container (parent) for visual components, including a component «Bookmarks» (Page control).

Properties of a bookmark are the followings: «Name», «Caption», «Hint», «Show hint», «Highlight» (it will be used for marking a bookmark by color).

Note 1: for setting of property «Tab position» it is required that the property «Tab style» should have «Tabs» value.

Note 2: for setting of property «Tab style» it is required that the property «Tab position» should have «Top» value.

4.2.4 Button

Button is a command element. It is used to give commands onto execution of definite functional operations. On a surface the button can contain the text and / or a picture (icon).

Properties of the component are the followings: Caption, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width.

Glyph – defines the raster image of the button. The dialog for image choice is used, which one allows to load or to save the loaded image in the format BMP.

Glyph number – image amount is indicated. By default the property has value 1 and the first image is always used for displaying on the button. Each button can contain four images maximum. From a state of the button, it depends which image is displayed in that moment.

Layout – defines the image (glyph) position on the button and it can accept following values: Glyph left (by default), Glyph right, Glyph top, Glyph bottom.

Macros name – reference to one of macroses created in «Data Administrator» (bookmark «Macroses»).

4.2.5 Image

«Image» is used for displaying the image of the appropriate format.

Properties of the component are the followings: Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width, Positioning.

Auto size – controls the possibility of automatic resizing for the component, so that they are equal to sizes of the image keeping in it. If to set «Yes» (True) value for the property then the sizes of a component are tuned up under image sizes, if to set «No» (False) value (by default), the sizes of a component do not vary.

Center – defines whether the image is centered inside a component. If «Yes» value is set for the property the image is centered, if the property has value «No» (by default), the image is aligned on the left upper angle of a component.

Picture – defines the image placed inside a component. The dialogue for choice of the image is used, which one allows to load or to save the loaded image in format BMP.

Auto scaling (Stretch) – controls possibility of automatic resizing of the image so that they are equal to sizes of a component in which the image is contained. If to set «Yes» (True) value for the property then the image sizes are tuned up under component sizes, if to set «No» (False) value (by default), the sizes of the image do not vary.

4.2.6 Frame

Frame is a rectangular frame with a header in the upper left corner, combines the control elements contained in it into a group.

Properties of the component are the followings: Caption, Color, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width, Positioning.

4.2.7 Panel

«Panel» represents the container, in which it is possible to place other elements of control. The panels are applied as visual resources of grouping. The panel has edge with a double bevel: inner and outer. The internal bevel frames the panel, and the external one is displayed around of it.

Properties of a component are the followings: Caption, Color, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width, Positioning.

Alignment – realizes control of the caption disposition, which can accept the following values: Left justify, Right justify, Center (by default).

Bevel inner, Bevel outer – define type of an inner and outer bevel accordingly. Each property can accept the following values: no, lowered and raised. By default «Bevel inner» property has the value – no value, and the property «Bevel outer» – raised value.

Bevel width – defines width of inner and outer bevels. By default is equal to 1.

Border style – defines a marking mode of panel dimensions and can accept the following values: no (by default), single.

Distance (Border width) – interval between bevels. By default width of the interval is equal to 0.

4.2.8 Bevel

«Bevel» represents rectangular areas, frames and lines. They have volumetric appearance. They are usually used to highlight other elements of the form, so that the elements are better perceived.

Properties of the component are the followings: Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width, Positioning.

Shape – defines the form of a bevel, possible values: box (by default), frame, top line, bottom line, left line, right line.

Style – defines style of a bevel and it can receive following values: lowered – the bevel looks submerged concerning a surface of allocation (by default), or raised.

4.2.9 Splitter

«Splitter» allows to resize elements of control directly at the time for application execution. Splitter controls boundaries only those components which contain property «Align».

Properties of the component are the followings: Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width, Color, Positioning.

Bevel inner – defines displaying style of visible edges of an inner bevel, creating illusion of volume, possible values are: none, lowered and raised. By default – none.

Bevel outer – defines displaying style of visible edges of an outer bevel, creating illusion of an volume, possible values are: none, lowered and raised. By default – raised.

Bevel width – defines width of inner and outer bevels. By default is equal to 1.

Border style – defines a marking mode of panel dimensions and can accept the following values: none (by default), single.

Bottom and right limit – defines limitation (in pixels) on the bottom (below) and on the right for a moved visual component. By default – 20.

Top and left limit – defines limitation (in pixels) on the top and at the left for a moved visual component. By default – 20.

To use «Splitter» component in the application, it is necessary:

1) To place an element of control, for example, Memo-field into the form and to align it along one of the form sides, having assigned «Top» or «Bottom» value for its property «Align».
2) To place a component «Splitter» and to assign to its property «Align» the same value, as property «Align» of the earlier pasted control element had.
3) To repeat two previous operations for all elements of the form control.
4) To assign the property «Align» of the last element of control to the value «In the window» (for this element to fill all remaining place in the form).

By default splitter lines are displayed horizontally. However, if necessary it is possible to set and vertical direction of splitter lines. For this purpose it is necessary to set «Left» or «Right» value for property «Align».

4.3 Components of data access

On the tab «Data Access» for the Palette of components contain non-visual components responsible for providing visual components with information from the database. These components interact with the libraries of access to data.

4.3.1 Connection of ADO

The component is used to connect to various ADO data sources.

Component properties: Time Activity of Timeout-a, Request Login-a, Save Connection, Connection String.

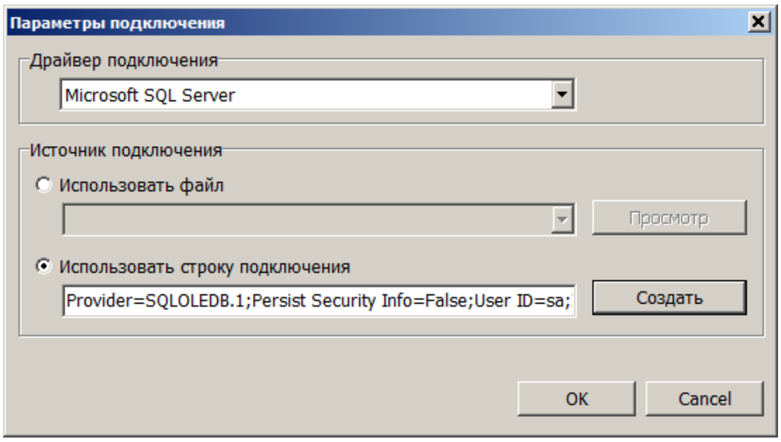
Activity – determines whether the connection is active or not, and allows you to change its state. The default value for the property is «No», meaning that the connection is closed. Setting the value of this property to «Yes» opens this connection.

Time of Timeout-a – indicates in seconds the waiting time of the moment after which the command will be considered unsuccessful. The default value for this property is 15 seconds. If the value of this property is 0, the provider will wait until the command is executed or canceled.

Request Login-a – It is used to display a dialog box for entering the user of identifier and the password when connecting to the database.

Save Connection – determines if it is necessary to close the connection when there are no active components working with the data via ADO. The default value for this property is «Yes», which means that this connection will be saved for applications that use remote database servers or frequently opened and closed datasets. This allows you to reduce the network load and increase the speed of the application.

The connection string is used to specify detailed information about the connections to the data source. The connection string can either be downloaded from a file, or obtained via a dialog. It is necessary to specify the connection driver and create a connection string.



Параметры подключения

Драйвер подключения: Microsoft SQL Server

Источник подключения

○ Использовать файл

● Использовать строку подключения: Provider=SQLOLEDB.1;Persist Security Info=False;User ID=sa;

Figure 3 - Form of «Connection settings»

4.3.2 Table ADO

The component is used to retrieve data from one table.

Component properties: Activity, Table Name, ADO Connection, Control of the data set, Control of the fields.

Activity – controls the activation of the table.

Table name – specifies the name of the database table from which the data will be retrieved. During development, the name is selected from a combo box containing the names of all the tables. To create a list, the property «ADO connection» must be set beforehand.

ADO connection – a link to the component «ADO connection» that provides control connection to objects of ADO data storage.

Control of the data set – defines the name of the master table. It is assigned when binding tables if the current table is a slave. At the time of development, the control table must be open.

Control of the fields – a dialog for determining the key (indexed) fields, through which the master and slave tables communicate.

4.3.3 Query of ADO

The component is used to define SQL operators that allow access to one or more tables in the data source.

Component properties: Activity, ADO Connection, Query text.

Activity – controls the activation of the request.

ADO connection – a link to the component «ADO Connection» that provides control connection to objects of ADO data storage.

Text of the query (Query text) – contains the text of the query, based on which records are selected in the data set. The query includes SQL commands and it is executed when the data set is opened. When creating a query, the editor is called to enter the text of SQL query. Creating a query, it is possible to use «Query Builder».

Query Builder is the editor that allows to type and to execute SQL queries (basic information about the SQL language is specified in section 2.6.1 of the documentation).

4.3.4 Table dBase

«Table dBase» (component – data source). It represents a data set that can be associated with one table of the form dBase. The data set returned by the component «Table dBase» is based on the navigation method of data access.

Properties of the component are the followings: Indent from the left, Name, Indent from the top.

Active connection – determines the way connection to the database table, the possible values are «Yes / No». The default is «No».

If the property «Yes» is set, an active connection to the table is performed, which means that the actions are synchronized with the table (move through the records, select in the linked table), conducted on all forms of the user, where an active connection to the same table is made.

For example, two forms of Form1 and Form2 have been created that contain the components of the Database Line1 and Database2 Line, respectively. Components of DB Line1 and DB Line2 are associated with the same database table (Properties the data set of the components have the same value). If you edit the value of a field in the current record using the Database component of Line1, Form1, the displayed value in the Database component of Line2, Form2 will automatically change.

Control dataset – determines the name of the master table. It is assigned when binding tables if the current table is a slave. At the time of design, the control table must be open.

Master fields (controlling fields) – the definition dialogue of the key (indexed) fields, by which the link between leading and detail tables is realized.

Table name – a filename is indicated, it is used to set the link between the database table and component «DB Table». It is selected by using the dialog of table choice from DB tables list definite by user in «Base Administrator».

Indexed fields, Indexes – set the current index. The current index is selected from the list of indexes which were set at table creation. Both properties are similar and they are used almost equally, but value of property «Indexes» is the name of the index which has been set at creation of the table and value of property Indexed fields is the name of a field for which the index was created. If the index consisting of several fields is used, for property Indexes the name of this index is set, and for property Indexed fields are listed (through a semicolon) names of fields which enter into this index.

4.3.4.1 Editor of fields

By default for each physical field, at opening a data set, it is created the object like TField. And all fields are available in the data set. These fields are dynamic. The special editor of fields is used for creation of static fields. In case at least one field of the data set is static, dynamic fields won't be created. Thus only static fields will be available in the data set, and all the others are considered as the absent ones. It is possible to define or cancel structure of static fields by means for the editor of fields at the stage form development of a user.

For start «Editor of Fields» it is necessary to right-click on the component «Table» and to select «Editor of Fields» item from the caused context menu. For movement on fields, 4 buttons of the editor or a context menu are used (they becomes more active pressing of the right button of a mouse on the list). The most part of the editor is occupied by the list of static fields, thus fields are listed as their creation sequence. This sequence can differ from the sequence of fields in DB table.

Originally the list of static fields is empty. By means editor of fields, the developer can:

- Create a new static field.
- Remove a static field.
- Change a sequence of static fields.
- Create a new field.

For addition of the static field it is necessary to cause a context menu for the editor of fields and to select the item «Add Field». As a result, there will appear dialog window (box) of addition for new fields. In the list «Available fields» there is contained, all those fields of the data set which aren't static yet. After a choice of one or several fields and «OK» button pressing this field is added in structure of static fields for the data set.

For creation of the new field it is necessary to select in a context menu of the editor of fields the item «New field». As a result, there will be a dialog box of creation for the new static field.

For a task of the general properties it is used the group of operating elements for «Property of the field». In the field «Name», it is set the field name. The type has to be set without fail for any field. The necessity of task for the field size depends on type.

Field type – the choice field which value can be chosen from the list formed on the basis of criteria and rules.

In group Properties of lookup-fields for the field of a choice are set such parameters, as a data set and communication fields, and also a field for formation of the list of the choice and result.

The field of a choice gives opportunity to choose one value from the offered list and automatically to bring information in the set field of modified record. The list completed by values of the specified field from the second table contacts the field of a choice. Both tables are connected with the help of the corresponding field.

Consider an example using the field of selection. In the draft database «The account and registration of land tenure» (Noginsk_district.DBX), the table «Rights of Individuals» (Rightf.dbf) is maintained in which information is entered (the name of fields of the table are specified in parentheses):

- Unique number of record (R_NUMB).
- Cadastral number of the land plot (R_CADNUM).
- Unique code of the right (R_PRAVO).

In the other table, «The Qualifier of Rights» (Spravr.dbf), it is stored data about each right, the table includes:

- Unique code of the right (S_NUMB).
- Name for a type of the right (S_NAME).

Create the choice field which contains the list of types for the rights from which the user chooses one of names. After a choice of the type for the right in the field R_PRAVO of the table, the corresponding code is automatically recorded.

For creation of the choice field, it is necessary to execute these actions:

1) In «Administrator of data» in a bookmark «forms of the user», press the button «Create». «Designer of forms» is activated.
2) To create a new form («Form / New», or having chosen the button «Create a new Form»).
3) Place the component «Table 1» which provides access to records of the table «Rights of Individuals» (Rightf.dbf) on the form.
4) Place the component «Table 2» which provides access to records of the table «The Qualifier of Rights» (Spravr.dbf) on the form.
5) Place the component «Grid» on the form for display of data «Table 1».
6) Add the static field R_PRAVO (component «Table 1») in the list with the help of the field editor.

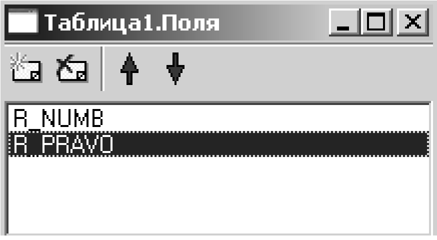


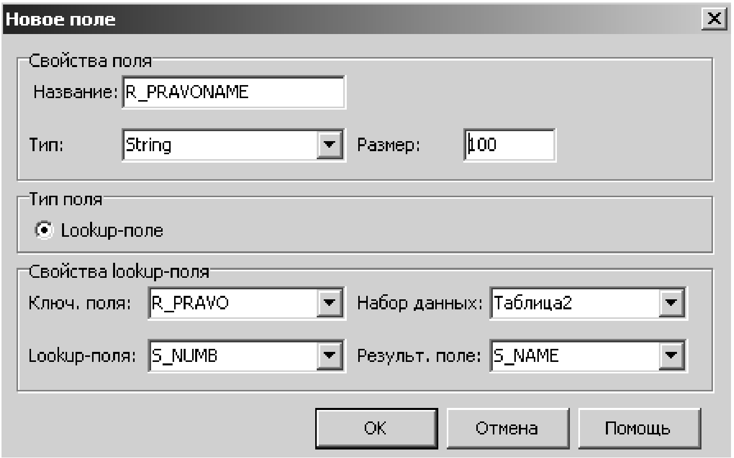
Таблица1.Поля

R_NUMB
R_PRAVO

Figure 4 - Editor of fields

7) Create a new field R_PRAVONAME (component «Table 1»).

The window of creation for the field of a choice is shown in Figure 5.



Новое поле

Свойства поля

Название: R_PRAVONAME

Тип: String

Размер: 100

Тип поля

● Lookup-поле

Свойства lookup-поля

Ключ. поля: R_PRAVO

Набор данных: Таблица2

Lookup-поля: S_NUMB

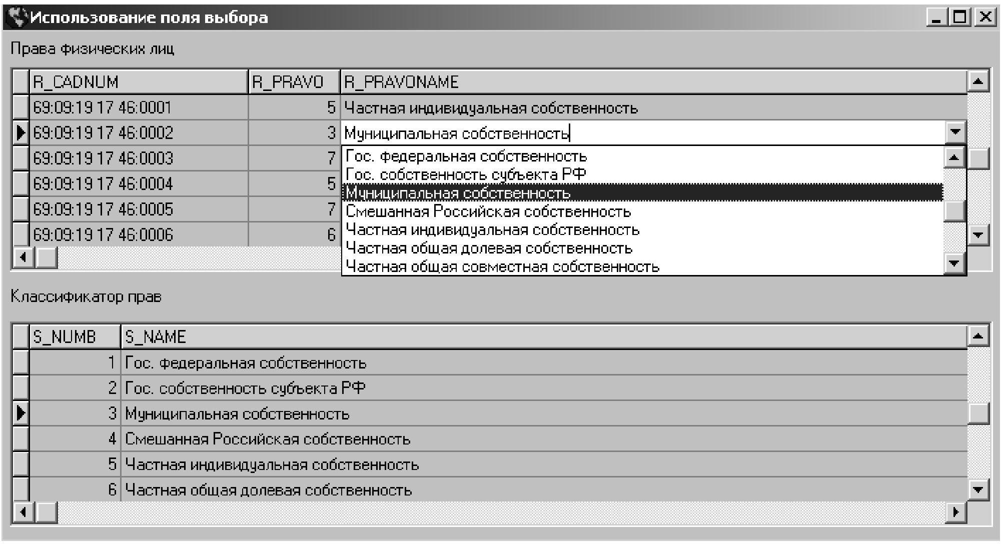
Результ. поле: S_NAME

Figure 5 - Field editor. Creating a new field

The field of a choice is called R_PRAVONAME, and belongs to the data set of «Table1». For a list of the choice formation it is used the data set field S_NAME «Table2». Communication, between two data sets of «Table1» and «Table2», is carried out through their fields of the code for the rights R_PRAVO and S_NUMB, respectively.

Using the field of the choice is that the user chooses value from the field of result R_PRAVONAME, containing the list which is constructed on the values basis of the field S_NAME. After the value choice, for the field R_PRAVONAME, from the field of communication of S_NUMB is automatically recorded the corresponding value in the field of R_PRAVO. Thus the field S_NAME, containing the list, is used for a choice, and the field of communication of R_PRAVO – for value entering in it.

The picture is an example of using the field of a choice. The table «Rights of Individuals» is displayed in the top part of a form. And in the lower part, it is the table of data which is provided for descriptive reasons. In practice the connected data set usually isn't shown. At a choice of values from the list in the field of the choice for the connected data set, the current index is established on record from which value was chosen.



Использование поля выбора

Права физических лиц

R_CADNUM	R_PRAVO	R_PRAVONAME
69:09:19 17 46:0001	5	Частная индивидуальная собственность
69:09:19 17 46:0002	3	Муниципальная собственность
69:09:19 17 46:0003	7	
69:09:19 17 46:0004	5	
69:09:19 17 46:0005	7	
69:09:19 17 46:0006	6	

Гос. федеральная собственность
Гос. собственность субъекта РФ
Муниципальная собственность
Смешанная Российская собственность
Частная индивидуальная собственность
Частная общая долевая собственность
Частная общая совместная собственность

Классификатор прав

S_NUMB	S_NAME
1	Гос. федеральная собственность
2	Гос. собственность субъекта РФ
3	Муниципальная собственность
4	Смешанная Российская собственность
5	Частная индивидуальная собственность
6	Частная общая долевая собственность

Figure 6 - User form using the selection field in the table

4.3.5 Parametrized query

Parameterized query is a collection of data whose records are generated as a result of SQL query execution. The code of Parameterized query is created or changed at the moment of its activation. Such queries are usually applied in that case, when it is necessary to provide for operations of the user.

Properties of the component are the followings: Auto editing, Active, Indent from the left, Name, Indent from the top, Database path (Connection), Text of query.

Active – defines whether the query is activated or not, possible values – «Yes» (True), «No» (False). «No» (False) value is assigned by default. If property has «Yes» (True) value the query execution is realized.

Connection – contains a link to the component «Connection_ADO».

Text of query – contains the text of the query, based on which records are selected in the data set. When creating a query, it is possible to use the «Query Builder».

Query builder – the editor permitting to enter and to execute the parameterized queries (SQL queries (the main information about SQL language is specified in item 2.6.1. of documentation)). The principle of operation in this editor is similar to the builder SQL queries (the basic information about which is specified in the documentation).

For setting of Parametrized query during the application's execution in its text it is possible to use parameters – variables, which names are made in characters «$» or «#» in the text of a query. The characters «$» and «#» are the service ones and between them the name of form's component is indicated which contains the specified parameter's value. At the moment of query activation, the concrete value from an appropriate component of the form is substituted instead of a name of the parameter – variable. The form's component is defined according to a name of the parameter – variable. For definition of values the components «Value edit» and «Operator combobox» are used.

If the value has the numeric type, the name of a component «Value edit» is enclosed in characters «$» (for example, $Value_edit $).

If the value has a character type, the name of a component «Value edit» is enclosed in characters «$2 and apostrophe (for example, $'Value_edit2'$).

For the logical operator a component's name «Operator combobox» should be enclosed in characters «#» (for example, #Operator_combobox1#).

```
select * from t_anygeonk where (t_anygeonk.name = $'Value_edit2'$)
#Operator_combobox1#(t_anygeonk.layer=$'Value_edit1'$)
```

If the component Parameterized query is located on «Data Module», it is necessary to activate the user form containing the components «Value edit » (Value input) and «Operator Selection». In this case, Query Builder will contain lists with the names of the components «Value edit» and «Operator Selection» of this form, which will simplify the construction of the query.

In the text of Parameterized Query, under selection conditions, it is possible to use data sets, located on «Data Module». For example, consider the query text:

```
select * from t_locality where t_locality. id = ~'data_ module1.table2. id '~
```

The result of execution for the operator SELECT is a data set that satisfies the selection criterion:
t_locality. id = ~ 'data_ module1.table2. id '~
The name of the field for the data set, located on Data Module, is input in the characters «~».

4.4 Components of data control

The visual components of operations with data are arranged on page «Data control» of Palette of components. They are intended for construction of the interface part for the application and they are used for moving along a data set, and also for displaying and editing of records.

The visual components of operations with data are similar to matching components for page «Common» (Design) and they differ substantially that they are connected to the database and have additional properties «Datafield name» and «Dataset name». For example, DB Text works the same as a component «Text». These components are differed that the component «DB Text» displays the value of a definite field for the current record of the data set.

All components of «Data control» page have properties:

- Datafield name – defines the reference to a concrete field in the table submitted by data set.
- Dataset name – defines the reference onto name of a component «Table_dbase» or «ADO Query» which is providing the link with a concrete set of the information from DB.

The note: the properties «Datafield name» and «Dataset name» are mandatory for filling.

4.4.1 DB String

DB String is used to display and to edit the value of some field for the current record.

Component properties: Color, Font, Height, Hint, Indent from the left, Read only, Name, Show hint, Indent from the top, Width, 3D Effect.

Register of symbols – determines the value of the register when displaying information, possible values: default, upper, lower. The default value is «default» (as recorded in the database field).

4.4.2 DB Memo-field

DB Memo-field is a multi-line text editor, to which a field with the type Memo or Blob is connected. Its main advantage is the ability to simultaneously view and edit several lines of variable length.

Component properties: Color, 3D Effect, Font, Height, Hint, Indent from the left, Read only, Name, Show hint, Indent from the top, Width.

Word wrapping – controls the automatic transfer of words that do not fit the width to another line, the possible values are «Yes», «No». The default value is «Yes».

4.4.3 DB Image

The component is intended for viewing images stored in the database in graphical mode.

Component properties: Data set, Color, Height, Hint, Indent from the left, Read only, Name, Show hint, Indent from the top, Width.

Data set is a pointer to an active data set that contains graphic information in a field of the Binary type.

Field – the field containing the graphic information is selected from the list.

Centering – determines whether the image is centered within the component. If the property is set to «Yes», the image is centered, if the property is set to «No» (default), the image is aligned to the top-left corner of the component.

Automatic scale – controls the ability to automatically resize the image so that they are equal to the size of the component in which it is contained. If the property is set to «Yes», the image sizes are adjusted to the component's size, if the value is «No» (default), then the image dimensions do not change.

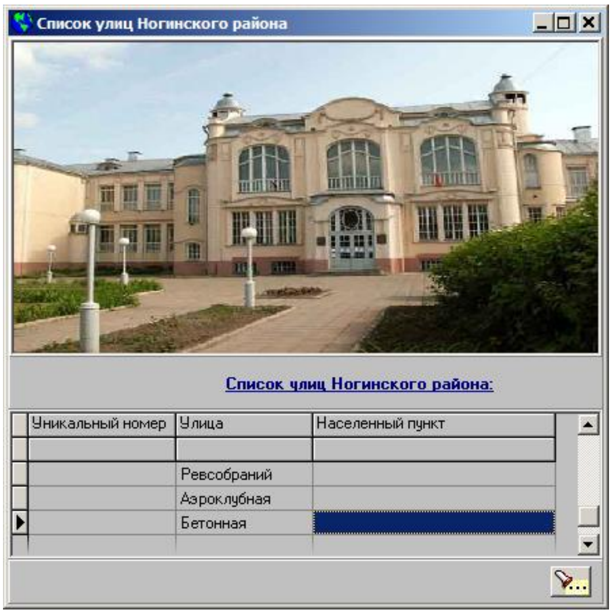
4.4.3.1 Example of creating a user form using the component «BD Image»

Consider the creation of a user form «List of streets Noginsk district». This form displays information about the streets using graphic information. The data is generated using the component Table dBase, which is located on «Data Module» (Data_Module.Table_List of streets, street.dbf)

To create a form, it is necessary to perform the following actions:

1) In «Administrator of data», on the bookmark «Data Sources», create «Data Module» on which to place the component Table_dBase (street.dbf).
2) In «Administrator of data» on the bookmark «Forms» of the user, click the button «Create». «Constructor Form» (Designer) is activated.
3) Create a new form (the command «Form / New», or by selecting the button «Create the new form»).
4) Place the component «DB Image» on the form. This component serves to display images. Set the property «Automatic scaling» to «Yes», Data set to – Data_Module – Table_List_streets, Field – IMAGESTR.

5) Save the created form.



Список улиц Ногинского района

Список улиц Ногинского района:

Уникальный номер	Улица	Населенный пункт
	Ревсобраний	
	Аэроклубная	
	Бетонная	

Figure 7 - User form with using the component «BD Image»

4.4.4 DB Text

«DB Text» is used for value displaying of some field for current record. The value of a field is output as non-editable text.

Component properties: Automatic size, Color, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width

Alignment is a way to align text within a component. One of the following values is possible:
- left – aligned (the default value);
- central;
- right – aligned.

Transparent – property is defined whether the title is transparent or filled. The color of filling is installed by «Color» property. By default the property has «No» (False) value and the title is not transparent. It may be necessary to make a component by transparent in cases when the text is located a top of the picture and should not cover the image.

Word wrapping – defines the possibility of placing a long set of characters with spaces in several lines, possible values are «Yes / No». By default is «No». The carry onto other string is provided by words.

4.4.5 DB Dropdown list

DB Dropdown list allows you to compactly display the list of field values for all records of the table and select the desired record. DB Dropdown list combines DB Text and DB dropdown list. The dropdown list in the minimized form takes up less space on the screen.

Component properties: Color, 3D Effect, Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width.

4.4.6 DB List classifier and DB Dropdown list classifier

When developing an application to work with a database, it often becomes necessary to link two sets of data to a key field. For example, in the table «List of semantics codes» of the database there is a field «Code1», which contains the identification code of semantics. Under the same code, the name of the semantics (field «Name») and its code («Code2» field) is stored in the table «List of semantics names». When developing the user interface, it is necessary to provide a mapping not of the semantics code, but of its name when viewing semantics in the form of application.

Thus, in the data set «List of semantics codes», instead of the code field, the field for naming the semantics from the table «List of semantics names» should appear. The mechanism of linking fields from different sets of data to a key field is called synchronous viewing. In the example considered, the field «Code2» from the table «List of semantics names» is the key, and the choice of a specific name is made by the coincidence of the values of the key field (Code2) and the replaced field (Code1) from the original data set. And it is necessary that in the table «List of semantics names» the field «Code2» should be unique (constituting the primary key).

The table in which the field is located, whose values are replaced by synchronous ones, will be called the initial table (table «List of semantics codes»).

The table containing the key field and the data field for synchronous viewing will be called the synchronous viewing table (the table «List of semantics names»).

DB List classifier, DB Dropdown list classifier – components of synchronous data viewing.

DB List - classifier

DB Dropdown list – classifier

DB List classifier is a list of values of the synchronous viewing field. Its main purpose is to automatically establish a correspondence between the fields of two sets for data by the same value of the specified field of the source table and the key field for the synchronous viewing table.

In terms of its functionality, the component is the same as the component DB List.

In terms of its functionality, the component DB dropdown list classifier is the same as the component of DB Dropdown list.

Component properties DB List classifier: Color, Field, Data set, Font, Height, Hint, Key field, _Field, _Set data, Left Indent, Name, Show hint, Indent from above, Width.

Component properties DB Dropdown list classifier: Color, Field, Data set, Font, Height, Hint, Key field, _Field, _Set data, Left Indent, Name, Show hint, Indent from above, Width, Positioning.

«Field» specifies a reference to a specific field in the table whose values are replaced by synchronous ones (this is the field Code1 in the example).

«Data set» specifies a reference to the name of the component «Table» that is associated with the source table (the table «List of semantics codes»).

The key field is the key field of the synchronous view table (field Code2).

«Field» specifies a reference to a specific field in the table for synchronous viewing (field «Name»).

«Data set» specifies a reference to the name of the component «Table» that is associated with the synchronous view table (the table «List of semantics names»).

4.4.7 DB Indexes list

«Indexes List» is used to sort the table entries. When using index, the speed of data search in the table is increased. The current index is selected from the list of indexes that have been created at the table creating.

Component properties: Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width.

Display mode – determines the composition of the list. The list can contain field labels, the index name, or the name of the field for which the index was created. The value of the field label is the same as the field name.

4.4.8 DB Grid

DB Grid allows to display and to edit, in a table form, information from all fields of the database table. The appearance of the grid corresponds to the internal structure of the database table and data set, with the row of the grid corresponding to the entry, and the column to the field.

Component properties: Color, 3D Effect, Font, Height, Hint, Indent from the left, Read only, Name, Show hint, Indent from the top, Width.

Options are a set of nested properties that define the attributes (Yes / No) of the appearance of the table's appearance elements-headers, current record indicators, horizontal line lines, vertical column lines. By default, all values are «Yes».

Columns are used to call «Column Editor».

Using the grid, the user controls the data set whose fields are displayed in it. To move through the records and view them, scrollbars and cursor keys are used. To switch to the editing mode of the current record field, it is enough to press any of the alphanumeric keys when the cursor is set to the field. Switching to the insert mode of a new record is performed when the key «Insert» is pressed. Inserting a record appears at the point where the current record pointer is located. Changes made when editing or adding an entry can be accepted by pressing the key «Enter» or by going to another entry, or canceling by pressing the key «Esc». To delete the entry, press the keys «Ctrl + Delete».

A single grid column is an object. By default, each column in the data set associated with the component Grid Database, automatically creates a separate column and all columns are available in the grid. Such columns are dynamic. To create static columns, use the special «Column Editor». If at least one grid column is static, no dynamic columns are created for any other field in the data set. And in the data set, static columns are available, and the remaining columns are considered inaccessible. You can define or cancel the composition of static columns by using «Column Editor» in the application development phase.

To advantages of static columns it is possible to carry that for their objects there is an opportunity to establish values of properties, distinct from properties of a corresponding field. For example, if you set your name for some static column, it will not change even if another field of the data set is associated with this column.

«Column Editor» can be called through the value of the property «Columns» in the «Object Inspector». The majority of the editor is occupied by a list of static columns, with the columns listed in the sequence in which they were created, which sequence may differ from the original sequence of the fields in the data set.

Initially, the list of static columns is empty. This means that all the grid columns are dynamic. Using «Column Editor», it is possible to do the following:

- create a new static column;
- delete a static column;
- reorder the static columns.

Basic properties of the column object:

- Alignment – controls the alignment of values in the cells of the column (columns), possible values – by left (default) or right, centered;
- Color – specifies the background color of the selected column;
- Font – defines the color, font and style of displaying symbols in the selected column, it is controlled both through the set of nested properties, and through the dialog box.
- Title – a set of nested properties that define the title of the column, the color of the header background, horizontal alignment of the header, font design of the title;
- Width – the width of the selected column when the grid is displayed;
- Headline font – defines the color, font and style of displaying all grid headers, it is managed both through a set of nested properties, and through a dialog box;
- Selection list – is a list for selecting the values entered in the field. The current cell, together with «Selection list», forms a kind of component for DB Dropdown list. If «Selection list» is generated for the column, when you try to edit the cell of this column to the right, an arrow appears, when you click it, a list opens, in which you can select one of the elements. It is possible to enter any valid value in the cell.

4.4.9 DB Objects grid

DB Object grid allows to display data in the arbitrary form. The component shows the contents of several records simultaneously in the same sets of visual components. A component is a set of panels, each of which serves as a platform for placing data of the individual record for the data set.

Component properties: 3D Effect, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width.

DB Object grid can display several identical panels, but one of them is active. During the design of the application, visual components, for example, DB Database or DB Text, are located on one (top) panel. Only data display components that can display the field value for a single record of a data set can be transferred to the panel. You can't use database components Grid, DB Dropdown list, DB Dropdown list-classifier. When placed on the panel Object Grids, the value of the property Data Set for the visual components is automatically set to the same value as the property Object Grids. When you run the application, components that are placed on the same panel are duplicated to other grid panels.

Number of columns is the number of simultaneously visible columns. A component can display panels in one or more columns.

Number of lines is the number of simultaneously visible lines. A component can display panels in one or more rows.

Orientation – determines the order of placement for records in the presence of several columns and it can take the following values:

- vertical – records are displayed horizontally – from left to right and from top to bottom (by default);
- horizontal – records are displayed vertically: from top to bottom and from left to right.

All grid panels have the same dimensions, determined by the properties «Panel height», «Panel width».

4.4.10 DB Navigator

DB Navigator provides the interface for managing a set of data. The component contains a set of buttons, each of which is responsible for performing one operation on the set of data (go to the first record, go to the previous record, go to the next record, go to the last record). In total there are 4 buttons, the developer can leave in a set any number of buttons in any combination

Component properties: Height, Indent from the left, Name, Indent from the top, Width.

The composition of the visible buttons determines the property «Button Display», which accepts combinations of the following values: first record, previous record, next record, last record. By default, all buttons are visible in the navigator.

Orientation – determination of the orientation for the control panel, possible values: horizontal (default) and vertical.

4.4.11 DB Panel of records editing (DB work panel)

DB Panel of records editing provides the interface for managing the data set. The component contains a set of buttons, each of which is responsible for performing one operation on a set of data (add a new entry, delete the current record, cancel changes in the current record, save the result of the record change). In total there are 4 buttons, the developer can leave in a set any number of buttons in any combination.

Component properties: Height, Indent from the left, Name, Indent from the top, Width.

The composition of the visible buttons determines the property «Button Display», which accepts combinations of the following values: add, delete, cancel, save. By default, all buttons are visible in the navigator.

Orientation – determination of the orientation of the control panel, possible values: horizontal (default) and vertical.

4.4.12 Chart

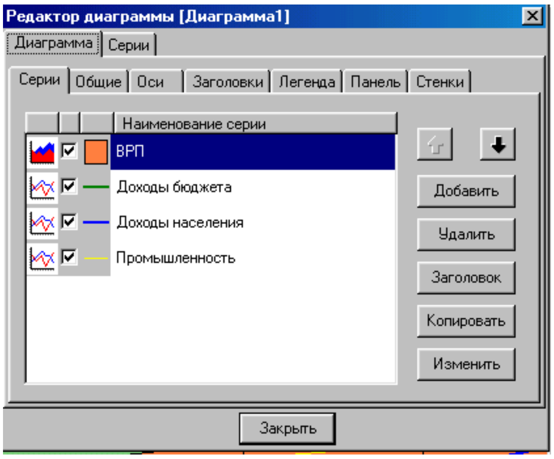
The component «Chart» is intended for representation of data from a certain set of data in the form of various diagrams and graphs. At the same time, it is possible to display graphs for several data fields. Graphs are built on the basis of all available field values in the data set.

Component properties: Height, Indent from the left, Name, Indent from the top, Width, Positioning, Settings.

This component is quite complex and it has a large number of various properties, many of which are objects and also have their properties. In practice, you set the values for these properties when you develop the application using «Chart Editor». The editor allows you to operate with properties – objects, information about which is displayed on the editor. The editor is called through the property value field – the object «Settings» in «Object Inspector». In the editor environment, you can set the properties of the chart (the page «Chart») and its series (the page «Series»). Contents of the window for editor is represented a tabbed notebook. For the new graph of the first one, the bookmark «Chart» is always displayed and for the page «Chart» – the bookmark «Series».

The information displayed in the chart (diagram) can be saved to a file BMP, EMF, or applied to the map as OLE – document. To do this, when the form is displayed, right-click on the diagram and select the required data format. To change the scale of the numerical axis with the left mouse button and draw the desired area on the chart. The key combination «Shift + Right mouse button» allows you to change the position of the chart.

Each of the bookmarks on the page «Chart» is intended for setting the parameters of a particular component of the chart.



Редактор диаграммы [Диаграмма1]

			Наименование серии
	☑	🟧	ВРП
	☑	—	Доходы бюджета
	☑	—	Доходы населения
	☑	—	Промышленность

Figure 8 - «Chart» component

4.4.12.1 *The bookmark «Series»*

It contains the series of graphics. The series is a set of points for the graph. On the graph, the series corresponds a separate line or row of columns. If there are several series in the chart, it will be displayed several lines or series of columns. In most cases, their values are constructed according to the same law and two or more series are simultaneously displayed in the graph for comparison. For example, the figure shows a graph consisting of four series. The first shows the gross regional product (GRP); the second – budget revenues; the third – incomes of the population; the fourth is industry.

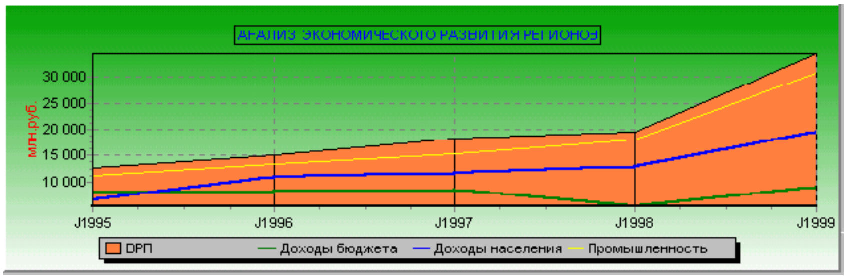


Figure 9 - Graph consisting of four series

To create a new series, it is necessary to click the button «Add», and then in the dialog that appears, select the type of the series. After that, the line of the new series appears in the list on the page «Series». Here you can override the type, color and visibility of the series by clicking on the corresponding zones.

The button «Add» is used to add other series, the button «Delete» is used to delete the current series. After clicking the button «Title», it is possible to define the title of the series, you need to click the button «Title», the button «Copy» – create a new instance of the same series in the same chart, the button «Change» – change the type of the current series.

4.4.12.2 *The bookmark «General»*

It is used to set the general parameters of the graph, such as its volumetric, indents from the edges, the possibility of scaling, scroll bars, etc.

The button «Print preview» is used to print a graphic, the button «Export» is used to save the graphic as a graphic file.

4.4.12.3 The bookmark «Axis»

It is used to determine axes of the graph.

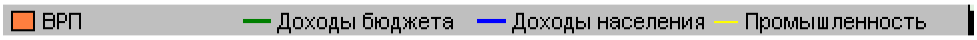
With the help of the switches «Show», it is possible to select the desired axis – left, right, top or bottom. On the page defined by the bookmark «Scale», the scale properties of the values for the selected axis are set. The switch «Auto» sets the automatic scaling of the data – the minimum and maximum are calculated dynamically, based on the current values of the series. If you cancel the automatic scaling, you can set the automatic scaling of the minimum (Minimum) or Maximum (Maximum) value (Auto). To set the maximum and (or) minimum values manually, click the appropriate button «Change». The scale step in the axis is selected automatically, if the step is set to 0. You can set a fixed step value by pressing the button «Edit». The bookmark «Title» is used to define the text of the title along the axis, the angle of its location, the size and the font, which displays the title. The bookmark «Tags» is used to define the label parameters (visibility of labels, font, tilt angle, size, spacing between labels, format, style). Using the bookmark «Strokes», it is possible to set the axis line parameters.

4.4.12.4 The bookmark «Titles»

It contains tools for determining the parameters of the title for the graph – the title text, its font, alignment, etc. For example, in Figure 8, the heading is «Analysis of economic development for regions».

4.4.12.5 The bookmark «Legend»

Using the bookmark «Legend», it is defined the parameters of the legend – area of the graph, in which explanatory information is provided. For example, in the figure, the legend is located below the graph.



🟧 ВРП — Доходы бюджета — Доходы населения — Промышленность

Figure 10 - Legend of the graph

4.4.12.6 The bookmark «Panel»

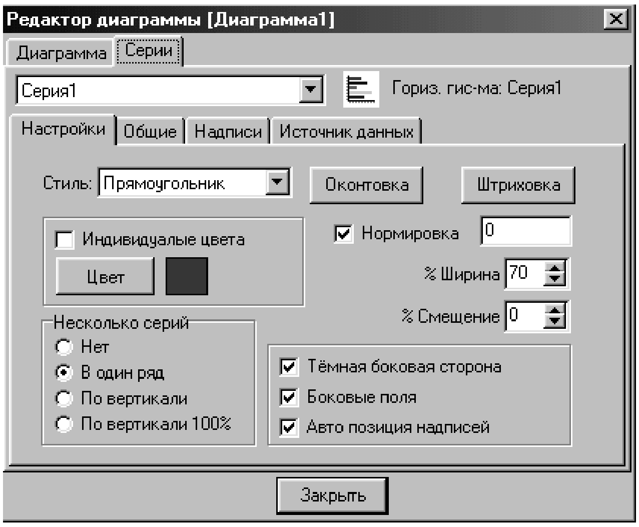
It is intended for setting the parameters of the panel on which the graph is located.

4.4.12.7 The bookmark «Walls»

It is intended for setting parameters (visibility, background color, fringing, fill, size) of the left and bottom «walls» of the graph.

4.4.12.8 Description of the page «Series»

It is used to set up the series of data values. On the page «Series», the necessary series is selected from the list of series names.



Редактор диаграммы [Диаграмма1]

Серия1

Гориз. гис-ма: Серия1

Стиль: Прямоугольник

☐ Индивидуалые цвета

☑ Нормировка 0

% Ширина 70

% Смещение 0

Несколько серий

○ Нет

● В один ряд

○ По вертикали

○ По вертикали 100%

☑ Тёмная боковая сторона

☑ Боковые поля

☑ Авто позиция надписей

Figure 11 - «Chart» component. «Series»

4.4.12.9 The bookmark «Settings»

It is used to determine the properties of the palette, the lines of the graph and other individual settings of the current series.

4.4.12.10 The bookmark «General»

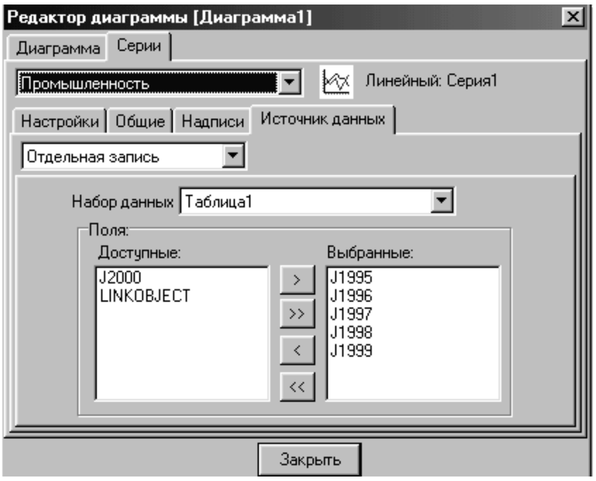
Here, the data formats are valued and percentaged, as well as the visibility of the legend.

4.4.12.11 The bookmark «Inscriptions»

It is intended for installation of marks – values over points of a series. The marks are displayed on the chart, if the switch «Visibility» is checked. The switches «Style» determine the type of marks.

4.4.12.12 The bookmark «Data Source»

The page «Data Source» defines the data source for the current series.



Редактор диаграммы [Диаграмма1]

Промышленность

Линейный: Серия1

Отдельная запись

Набор данных Таблица1

Поля:

Доступные:
J2000
LINKOBJECT

Выбранные:
J1995
J1996
J1997
J1998
J1999

Figure 12 - «Chart» component. «Series»

The dropdown list below the bookmark allows you to determine the type of data source for the series:

- No data;

- Random values;
- Data set;
- Separate entry;
- Calculator.

No data – a series is not assigned the data source at the design stage.

Random values are a collection of random numbers. It is useful in forming the billet of the series, so that without indicating real data, visually assess the capabilities of a particular series.

Data set – allows you to specify (as data source) a data set which field values will be used to form the series points. As a data set, you can specify «Table» or «Request». By the time the fields are selected, the component «Table» or «Request» has to be placed on the form and linked to the required table. The required data set is selected from the drop-down list «Data Set». The list X allows you to select the field of the data set which values will be sequentially plotted along the abscissa axis. The list Y allows you to select the field of the data set which values will be sequentially plotted along the ordinate axis. The correspondence between field values in two axes is determined by belonging to one record of the data set. Selecting a field in the list «Tags» links its values in the form of labels to the abscissa axis. Symbolic fields and date-type fields can be used as labels.

Note 1. Not all series types require values for the axes X or Y. For series such as «pie chart», «histogram» and «horizontal histogram», it is possible to specify values for only one of the axes and the value of the labels.

Note 2. For a series of «superficial graphs» it is required to set values along the axis Z.

Note 3. A series of «bubble chart» type requires a radius command.

Single record – allows you to specify (as a data source) a separate record from the data set which field values will be used to form the points of the series. To specify a separate entry as a data source, select the data set from the drop-down list «Data set». Then, from the list of available fields, select the necessary («transfer» them to the list of selected fields).

Note 1. Not all series types support working with a single record. Types of series that support the work with a separate record: histograms, line graph, area graph, dot graph, pie chart.

Calculator – allows you to specify (as a data source) the component «Calculator», the value of which will be used to form the points of the series. By the time the component is selected, «Calculator» must be placed on the form. To set «Calculator» as a data source, you need to select the necessary («transfer» them to the list of selected calculators) from the list of available calculators.

Note 1. Not all types of series support work with «Calculator». Types of series that support the work with the «Calculator»: histograms, line graphs, area graphs, dot graphs, pie charts.

4.4.12.13 Example of a graph construction

To plot the graph of values for a field of a data set, it is necessary to do the following:

1) Place the component «Table» on the form and associate it with the required table;
2) Place the component «Chart» (Diagram) on the form;
3) Using the specialized «Chart Editor» (Diagram Editor) component to create a new series and determine its type;
4) Set the data set for the series;

5) Associate the required coordinate fields in the data set, and depending on the type of the series, to specify additional parameters.

4.4.13 Calculator

Calculator allows you to perform calculations using mathematical expressions and data from the numeric fields of the data set.

Component properties: Font, Height, Hint, Indent from the left, Name, Show hint, Indent from the top, Width.

Property of Auto-calculation determines whether to automatically recalculate a mathematical expression when changing data or not. If the value of the property is «No», then the recalculation is performed only if the button is pressed to the right of the calculator row.

Mathematical expressions using the numeric fields of active data sets are specified using the editor «Expressions». The editor is called through the value field of the property – the object «Expression» in «Object Inspector».

The editor «Expression» contains three lists: «Data Set», «Fields», «Operators and Functions»:

- Data set – consists of the names for active data sets (names of all components – data sources that are located on the form);
- Fields – contains the name of the fields for the selected data set;
- Operators and functions – contains a list of mathematical operators and functions.

The window «Expression» displays the mathematical expression that the user has drawn up.

For example, to find the sum of two numeric fields in a dataset, it is necessary to:

1) In the list «Data set», select the required data set. The list of «Fields» for the selected data set is automatically generated.
2) Press the mouse button twice, to select the required field in the list (the first item).
3) Press the mouse button twice, to select the operator «+».
4) After double clicking on the mouse button, select the second item in the list.

Note1: There should not be any gaps in the mathematical expression.

Note2: You can not use mathematical functions except those that are predefined in the editor «Expressions».

4.4.14 Editor of a logical field

The editor of logical field is used to display and to edit the value of the logical field for the current record.

Component properties: Height, Caption, Logical field, Data set, Name, Indent from the top, Indent from the left, Hint, Show hint, Read only, Color, Width, Fonts.

The editor looks like a rectangle with a text header. If there is a tick in it, the field has the value «True».

The user can toggle the checkbox by clicking the mouse. If the checkbox is cleared, it becomes enabled after a click, and vice versa. In this case, the value of the field is accordingly changed.

4.4.15 Value editing

«Value editing» represents the information input field for parametrized query.

Component properties: Height, Value, Name, Indent from the top, Indent from the left, Hint, Show hint, Font, Width.

The component «Value edit» allows to enter from keyboard and to edit different characters, thus following operations are supported: moving along string with usage of arrow keys, deleting of characters by keys «Backspace» and «Delete», marking of a text part etc.

4.4.16 Operator choice

«Operator combobox» component represents a drop-down list accepting choice of elements from the list.

Component properties: Height, Index, Name, Indent from the top, Indent from the left, Hint, Show hint, Color, Width, Font.

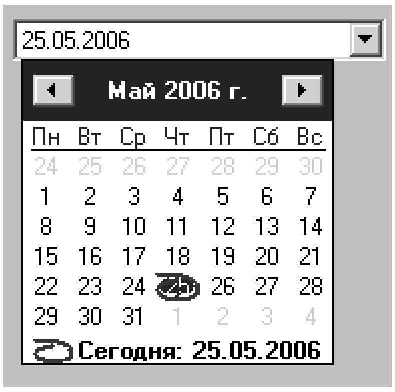
The list contains the logical operators for the parameterized query: AND – logical AND, OR – logical OR, NOT – negation.

4.4.17 DB «Date/time»

DB «Date/time» does possible processing date and time values. This component is an auxiliary tool for entering date and time values. With its help it is possible to change value of time or directly, or by means of buttons with arrows.

Component properties: Time Height, Date, Availability, Max. Date, Min. Date, Data set, Title, Indent from the top, Indent from the left, Tab stop, Format, Field, Type, Color, Width, Font.

A date calendar can be used to select a date when using a component. Clicking the left mouse button on the name of the month, activate the list of months. To change the year, left-click on the value of the year.



25.05.2006

Май 2006 г.

Пн	Вт	Ср	Чт	Пт	Сб	Вс
24	25	26	27	28	29	30
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Сегодня: 25.05.2006

Figure 13 - Component DB «Date/time»

Type – specifies whether the component is used to enter a date or select a date or time.

Date – property contains the date that the user specified in the input field of the component. By default, this property is set to the system current date.

Time – property contains the time that the user specified in the component's input field. The default is the current system time.

Format – sets the date format in the calendar component.

Table 1 shows the possible value of the properties.

Table 1 - DB «Date/time»

Element	Description
d	It displays the number of months without zero in the left digit (1-31).
dd	It displays the number of months with zero in the left digit (01-31).
ddd	It displays the day of the week according to abbreviated names (Mon, Tues, Wed.).
dddd	It displays the day of the week in accordance with the full names.
h	It displays the hour as a number without zero in the left digit (0-12) in the 12-hour scale.
hh	It displays the hour as the number with zero in the left digit (00-12) in the 12-hour scale.
H	It displays the hour as a non-zero number in the left digit (0-24) in the 24-hour scale.
HH	It displays the hour as a number with zero in the left digit (00-24) in the 24-hour scale.
m	It displays the month as a number without zero in the left digit (1-12).
mm	It displays the month as a number with a zero in the left digit (01-12).
MMM	It displays the month according to the full names.
yy	It displays the year in two digits.
yyyy	It displays the year with four digits.

For example, if to set a format of the kind MMM dd, yyyy, in the entry field of a component will be displayed date – May 25, 2006.

Max. Date, Min. Date – sets the limitations of the date values when editing.

Availability – the property enables / disables changes to the component input field.

The stop on «Tab» – the property allows / prohibits the transition to the component by the key «Tab».

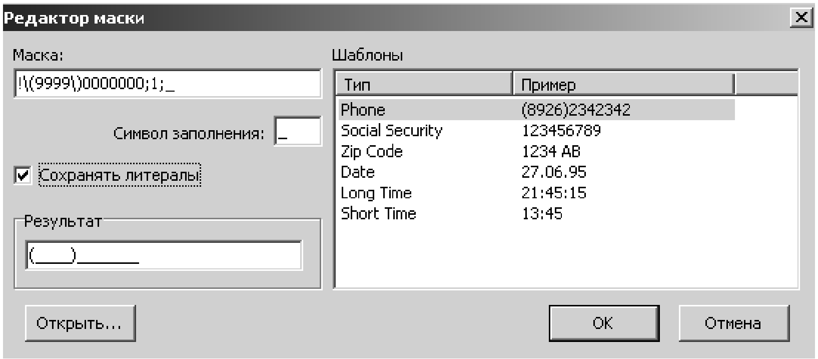
The tabulation order – specifies the order number of the component when the components are traversed by the key «Tab».

4.4.18 Line with a mask

The line with a mask represents the one-line editor which in addition gives opportunity of restriction for entered information on a template. By means of a template (mask) it is possible to limit number of symbols entered by the user, their type (line, numerical). Besides, it is possible to insert additional symbols into entered information (for example, dividers at input of date, time). By means of editing on a mask it is convenient to enter telephone numbers, dates, postal indexes and other information of in advance defined format.

Component properties: 3DEffect, Height, Availability, Data Set, Title, Editing Mask, Indent from the top, Indent from the left, Tab Order, Color, Width, Font.

The editing mask – the property allows you to set a mask. It is a sequence of special codes defining for a line of editing a format for the text containing in it. To create a mask, it is possible to use «Mask Editor».


Редактор маски

Маска: !\(9999\)0000000;1;_

Символ заполнения: _

☑ Сохранять литералы

Результат: (____)_______

Шаблоны

Тип	Пример
Phone	(8926)2342342
Social Security	123456789
Zip Code	1234 AB
Date	27.06.95
Long Time	21:45:15
Short Time	13:45

Figure 14 - Component «Line with a mask»

The mask consists of three fields, separated by the symbol «;». The first field is actually a mask. The second field is a symbol that determines whether literal characters are considered part of the data. By default, the symbol «1» is used, and the literal mask symbols are part of the text entered in the editor. If you set the symbol «0» instead of «1», the literal characters of the mask will still be displayed in the editor field when you enter text into it. The third field contains the character used to represent the space character in the mask, the default is the underscore character. If neither the second nor the third fields are defined, then the default values are used for them.

Table 2 - Special symbols for the mask

Symbol	Explanation
!	In the text initial gaps are suppressed. If symbol! No, final gaps are suppressed.
>	Symbols which follow this symbol, before emergence of a symbol < are transferred to the top register.
<	Symbols which follow this symbol, before emergence of a symbol > are transferred to the bottom register.
<>	Checking of character registers is not performed.
\	The character following this character is a literal.
L	The alphabetic symbol has to be entered into positions.
L	(Lower case of Latin letter L) – can be entered into positions an alphabetic symbol.
A	The alphanumeric symbol can be entered into positions.
A	The alphanumeric symbol can be entered into positions.
C	The symbol has to be entered into positions.
C	The symbol can be entered into positions.
0	The digital symbol has to be entered into positions.
9	The digital symbol can be entered into positions.
#	The digital symbol can be entered into positions or «+» and «–»
:	It is used for division of hours, minutes and seconds in time indications.
/	It is used for division of days, months and years in dates.
;	It divides the fields of the mask.
_	It leaves an empty space in the editing window, being passed divider automatically, and into which it is impossible to enter information.

Examples of masks:
! 99/99/00; 1; _ – to enter the date.
! 90: 00; 1; _ – to indicate the time.
l_l_l_l_l_l_; l; _ – to enter a word with a maximum of six letters (between letters gaps are displayed).

It is possible to prepare a mask and manually, however it is more difficult. If necessary it is convenient, having used the Editor of a mask, to choose a suitable mask from the file of masks (DEM), and then to modify it. The example of the file for masks is applied together with system installation in the directory «\Panorama9\DATA\PODOLSK\DataBase\rus.dem»

The tabulation order (sequence) – sets serial number of a component when the bypass component by pressing «Tab».

4.5 Components of service

4.5.1 Work panel

«Work panel» provides a user-form interface with a digital map. The component contains a set of buttons, each of which is responsible for executing one operation (main form, form constructor, filter, filter reset, bind, find object, find record, allocate objects, clear allocation, break connection, show records for allocated objects). In total there are 11 buttons, the developer can keep in a set any number of buttons in any combination.

Component properties: Height, Indent from the left, Name, Indent from the top, Width.

The composition of the visible buttons determines the property «Display Button», which accepts combinations of the following values: main form, form constructor, filter, filter reset, bind, find object, find record, allocate objects, clear allocation, break connection, show records for allocated objects. By default all buttons are visible.

Orientation – determination of the orientation for the control panel, there are possible values: horizontal and vertical. The default is horizontal.

Data set – determines for which data set off the form, there are performed operations of communication with the map objects. If no field is specified, then it is taken «Active Set of Data Form».

Using the work panel, it is possible to:

- Call «Form constructor» for editing of the form;
- Activate the data manager;
- Find the necessary record in the table, to link current record with the map object;
- Find the object on a map, linked with current record;
- Find appropriate record in the table, having selected the object on a map;
- Allocate those objects on a map, which are linked with the loaded table;
- Show records for allocated objects;
- Carry out vertical layer-by-layer movement on the map objects,
- Carry out auto search, which allows to automatically allocate objects when moving through the records of the table.

4.5.2 Macros list

«Macros list» allows to increase the functionality when working with user forms.

Component properties: Name, Macros list.

Name – contains the name (identifier) of the component by which to access this component.

Macros list – is used to call «Editor of form macroses». Using «Editor of form macroses» it is possible to do the followings:

- Rename a macros name;
- Add a macros;
- Delete a macros.

In the Editor, when you click the button «Add», a macro with the name «Macros_form1» is automatically added. For the macros, in «Object Inspector», it is necessary to select the type of macros. The type of macros determines the execution of certain actions:

- Call of the geocoding form;
- Dataset report;
- Run application;
- Open a map;
- Save dataset to file;
- Place the point objects;
- Create filter;
- Create query;
- Save the request to a temporary table;
- Formation of a parameterized query;
- Construction of isolines for point objects;
- Enable / Disable filtering;
- Open the data;
- Close the data;
- Calculation on a map;
- Create a parameterized filter;
- Record the form name in the table;
- Run Dll;
- Open the form from the table;
- Run the application with the parameters from the table.

Each type of macros has at least two properties:

- Name – contains the name (identifier) of the macros by which to access this macros;
- Macros type – determines the type of actions to be performed.

Macros «Call of the geocoding form» has the following properties:

- Data set – defines a link to the name of the component «Table» (or «Query»), which provides communication with a specific set of information from the database.

Macros «Report for data set» has the following properties:

- The name of the template file is the name of the template file, created and configured in advance in Microsoft Office.

Reports are created using Microsoft Office tools (for templates with the extension XLT – MS Excel, with the extension DOT – MS Word).

Document template – consists of a descriptive part that is not automatically edited, and data fields (key fields) that are replaced in the process of report creation with the corresponding values from the table. Data fields are the names of fields in the table in the form of a set of capital letters enclosed between the characters «#». For example, NUMBER is the name of the table field, #NUMBER# is the name of the data field in the template.

Report type – indicates the type of the report to be generated and it can take values: Excel – report for all records (default), Excel – report for the current record, Word – report for the current record, by template type.

Reports can be tabular and in form.

Table report can be created only on the basis of MS Excel template and contains data in the form of a table. In the first line of the report template, where it is necessary to start printing data as a table, the names of the data fields should be listed. As the example, a tabular report is provided based on a template named ExExcel.xlt.

The report on a form is a document in which the names of the data fields are specified in any location chosen by the user, and they can be repeated. The report on the form is created on the basis of a template MS Word or MS Excel. As the example, a tabular report is provided based on a template named ExWord.xlt.

Data set – defines a link to the name of the component «Table» (or «Query»), which provides communication with a specific set of information from the database.

Macros «Run Application» has the following properties:

- Application name – specifies the name of the file with the extension EXE, which is selected using the standard file selection dialog.

Macros «Open Map» has the following properties:

- Data set – defines a link to the name of the component «Table» (or «Query»), which provides communication with a specific set of information from the database;
- The field with the name of the map, Field with the coordinate X, Field with the coordinate Y – contain the names of the corresponding fields.
- Coordinate system – indicates the coordinate system and it can take the values: meters, degrees, radians.

Macros «Save dataset to file» has the following properties:

- Dataset name – defines the reference onto a component's name «Table» (or «Query»), which provides link with a concrete set of the information from the database;

Macros «Place point objects» has the following properties:

- Dataset name – defines the reference onto a component's name «Table» (or «Query»), which provides link with a concrete set of the information from the database;
- The field with the name of the map, the field with the coordinate X, the field with the coordinate Y, the field with the coordinate H – contain the names for the corresponding fields of the table.
- Coordinate system – indicates the coordinate system and it can take the values: meters, degrees, radians.
- Establish communication – to establish or not, the connection of the object being created with the corresponding record for the database table. Established communication in the subsequent work with the database allows to find the object corresponding to it from the record in the table, or, on the contrary, on the object to find the record.

Macros «Create filter» has the following properties:

- Filter form type – indicates the form type of installed filter and it can accept values: advanced template, simple template. The search of records in the current data table is executed by creation

of the query text by the user and filtering of the data by the query. After the query is executed, only those records that satisfy the specified conditions are available for viewing and editing.
- Data set – defines a reference to the name of the component «Table» (or «Query»), which provides communication with a specific set of information from the database.

Macros «Create query» has the following properties:
- SQL query – defines the reference onto a component's name «Query», provides communication with a specific set of information from the database;

Macros «Save query» has the following properties:
- Temporary table – defines reference onto name of a component such as «Save query», the execution of which this macros realize;

Macros «Create parametrized query» has the following properties:
- Parametrized query – defines reference onto name of a component such as «Parametrized query», which provides the formation of query parameters;
- Auto execution (Automatic execution) – defines whether it is necessary to show the editing form of the obtained query text (the value is «No» – False value) or to execute a query automatically (the value is «Yes» – True value).

Macros «Building isolines» has the following properties:
- Data set – defines reference onto name of a component such as «Table» (or «Query»), providing link with a concrete set of information from the database. For this data set the function of building isolines will be called.

For execution of macros it is necessary to place on the form together with a component «Macros list» the component «Button» and for its property «Macros» to select required one from the list.

Macros «Turn On/Off filtering» (Enable / Disable Filtering) has the following properties:
- Data set – defines the reference onto a component's name of data access (Table, Query, Parameterized query), which provide link with a concrete set of the information from the database.
- Filtered flag (Set filtering) – if you choose the value «Yes» (True), the filtering of a dataset is doing, value «No» (False) – resets a filter.

Macros «Open dataset» has the following properties:
- Data set – defines the reference onto a component's name of data access (Table, Query Parameterized query), which provide link with a concrete set of the information from the database.

Macros «Close dataset» has the following properties:
- Data set – defines the reference onto a component's name of data access (Table, Query, Parameterized query), which provide link with a concrete set of the information from the database.

Macro «Run Dll» has the following properties:
- Field name with Dll, Dll file name is specified, either the name of the table field containing the name Dll or the file name with the extension Dll;
- Type Dll is selected the standard or extended type Dll.

It is advanced type. To call a task in the module, an extended function must be declared:

```
extern «C»
{
 long int _ export WINAPI CallMapFunctionDb(long int hmap, TASKPARM * parm, const char * tablename);
  {
   ...
  }
}
```

The variable hmap contains the identifier of the open map. The structure TASKPARM is described in the file maptype.h.

The constant tablename contains the full name of the database table file (dBase). In the process of working with a macros, a temporary table is created, which is not automatically deleted.

It is standard type. To call a task in the module, a standard function must be declared:

```
extern «C»
{
 long int _ export WINAPI CallMapFunction(long int hmap, TASKPARM * parm);
  {
   ...
  }
}
```

Applied tasks must be in DLL format.

Macros «Run application with parameters from the table» has the following properties:

- Exe file name – the name of the file with the extension EXE is specified, which is selected using the standard file selection dialog;
- Field with parameters – indicates the name of the field in the table that contains parameters for running the application.

Macro «Open form from a table» has the following properties:

- Field with the name of the form – indicates the name for the field of the table, containing the name of the user form in this project.

Macro «Record name of the form to the table» has the following properties:

- Field with the name of the form – indicates the name of the field for the table, into which the name of the user form is recorded in this project.

Macros «Map calculation» has the following properties:

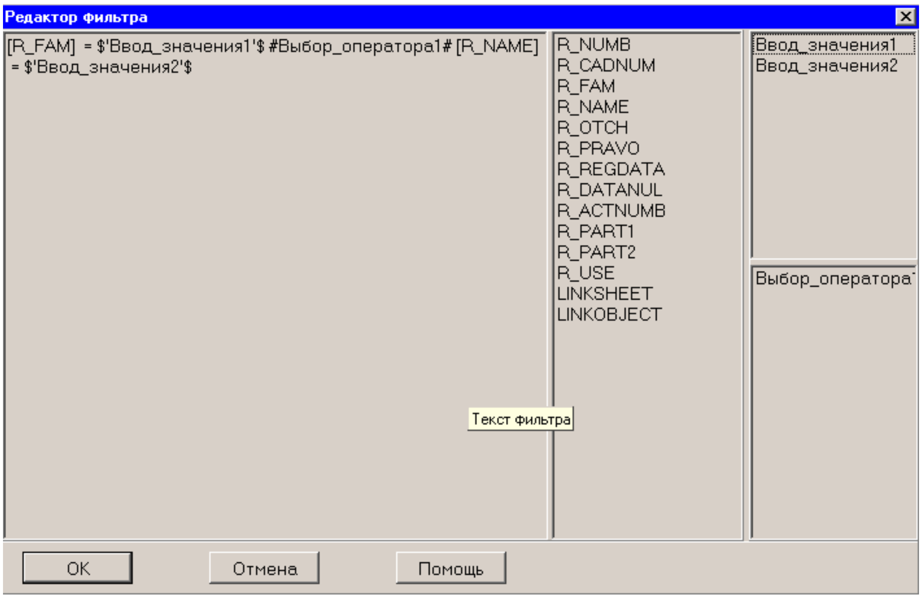
- Data set – defines the reference onto a component's name of data access «Table». For the data table the link with a map should be set.
- The field for recording the result – a field is selected from the fields list of a data set. Result of map function will be recorded into the specified field. The type of a selected field should correspond to the type of map function. For example, the results of map functions «Area» and «Length» are recorded into fields of type String or Double, Classifier code and Object number – into fields of type String or Integer, Name – into a field of String type.

- Type of calculation function – indicates the type of the calculation function, it can take the following values: length, classification code, name, object number, area.

Macros «Create parameterized filter» has the following properties:

- Auto execution – defines whether it is necessary to show the editing form of the obtained filter text (the value is «No» – False value) or to set a filter automatically (the value is «Yes» – True value).
- Data set – defines the reference onto a component's name of data access (Table, Query, Parameterized query), which provide link with a concrete set of the information from the database.
- Filter options – contains a filter text. If «Parameterized filter» is used the data set is limited by records satisfying to the filter defining conditions of records selection. For creation of a filter, it is used «Filter editor», which one is called through a value field of the specified property.

«Editor» (Filter editor) window is divided onto four parts: filter text, fields list of a data set, list of components names for input of values and list of components names for choice of the logical operators. At placing of the mouse cursor onto each part of «Editor», it is displayed the hint about its assignment.



[R_FAM] = $'Ввод_значения1'$ #Выбор_оператора1# [R_NAME] = $'Ввод_значения2'$

Figure 15 - Macros «Create the parameterized filter». Editor window

The filter expression represents a construction, which can include the following elements:

- Names of tables fields;
- Literals;
- Names of components for input of values;
- Comparing operation;
- Logic operations;
- Names of components for operators choice.

If the field name contains Russian characters, it is enclosed in square brackets.

The literal represents value, which is set obviously (for example, number, string or character).

In filter expressions it is possible to use names of components for input of values, with help of which the filtering value will be set during review of the user form.

If the value has the numerical type, the name of a component «Value Entry» is enclosed in «$» characters (for example, $Value_edit$).

If the value has a character type, the name of a component «Value Entry» is enclosed in «$» characters and apostrophe (for example, $'Value_edit2'$).

Table 3 - Comparison operations

Symbol	**Explanation**
=	equal to
<	less than
>	more
<=	less than and equal to
>=	greater than and equal to
<>	is not equal to

It is possible to use AND, OR, NOT as logical operations, or to specify the name of the component to select logical operators. And the name of the component for selecting logical operators must be enclosed in the characters «#» (for example, #Operator_choice1#).

In the filter text, the field name and comparison operations must be separated by a space (gap).

The examples of setting filter conditions for the table locality.dbf, there are the following expressions:

```
[SEM9]  =  ' Aborino '  AND  [POSEL_ID] = 6
[SEM9]  = $'Enter_value1'$  #Operator_choice1#  [POSEL_ID]=$Enter_value2$
```

The first expression selects all records for which the field values are explicitly set: SEM9 is 'Aborino' and the field POSEL_ID = 6, and for the second, field values are specified using the 'Input_value' components and the component 'Operator_Configuration'. At the moment the filter is activated, instead of the parameter name – the variable is substituted with a specific value from the corresponding form component.

To form the second expression, it is necessary that the form of the user contains the components 'Input_values' and 'Operator_ Choice'. To create this expression in «Editor», select the field name and «drag» it to the filter text box, then enter the comparison operation. Select and drag the component name to enter values, select an operator, and so on. The field name will be recorded without square brackets, if you press «Shift» while transferring.

To activate and deactivate the filter, use the macro «Enable / Disable Filtering».

4.5.2.1 The example of creating a user form using the component «List of macroses»

Consider creating a user form «Print a report». The form contains a button «Report», by clicking which the report will be generated in Microsoft Excel. The report is printed based on the template created and configured in advance.

To create a form, it is necessary to perform the following actions:

1) In «Data Manager» (Data Administrator) on the bookmark «User Forms», click the button «Create». «Form constructor» is activated;
2) Create a new form (the easiest way is to do this using the command «Form / New», or by selecting the button «Create a new form»);
3) Place the component «Table» (or «Request_ADO» (Query_ADO)) on the form and configure it;
4) Place the component «Macro List» on the form;
5) Using the specialized component «Editor of macros form» (which is called through the property value field – object «List of macroses» in «Object Inspector») add the macros;

6) Set data set, name, choose the type of macros – Report for data set;
7) Select the report type and the name of the template file (optional parameter);
8) Rename the macros, for more visual and convenient use. For example, change the name «Macros_form1» to «Print»;
9) Click the button «Exit» of «Editor of macros form».
10) Place the component «Button» on the form. Set the property «Macros» the value to «Print».
11) Save the created form.

4.5.3 Save query into table

The component automatically stores the results of the query SQL in the data table.

Component properties: Activity, Table name, Caption, Indent from the top, Indent from the left, Location, Text of query.

The name of the table is the name of the file. It is selected using the table selection dialog from the set of database tables defined by the user in «Data Manager» (Data Administrator).

Text of query – the property contains the text of the query, based on which records are selected in the data set. The query includes SQL commands. When creating a query during the development phase, it is possible to use «Query builder» or «Query editor».

Activity – indicates the need to execute a query and save its results to the table.
When the form is activated, the component «Saving a query to the table» is always done the first. Due to this, other form components can refer to the table formed as a result of the query.

CHANGE LOG SHEET

Changes.	*Numbers of sheets (pages)*				*All sheets (pages) in document.*	*Document #*	*Incoming no. escort-tional document and the date*	*Signature*	*Date*
	changed	*replaces*	*new*	*cancelled*					