

gadgets

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Chapter 1

gadgets

1.1 GUIEnvironment/Gadgets guide

GUIEnvironment

Gadgets guide

```
=====
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=====
```

Creating gadgets

Gadtools gadgets

BOOPSI gadgets

GUIEnvironment gadgets

Gadget description flags

Localizing

The gadget help function

Special features

Gadget action

The gadget message handling

Key Equivalents

Getting and setting gadget attributes

The GUIGadgetInfo structure

The gadget kinds

The gadget tags

1.2 Creating gadgets

Creating gadgets using GUIEnvironment is very simple. First you have to create the GUIInfo structure !

After that simply do for each gadget a call to CreateGUIGadget with the needed attributes and then you can use these gadgets after a call to DrawGUI.

CreateGUIGadget needs first the position and the size of the gadget. The position is always inside the window ! So a position of 0,0 would be the left top corner of the inner window !

If the gadget is created GUIEnvironment sets the UserData entry of this gadget to a GUIGadgetInfo structure. This structure is read only and it is not allowed to change the UserData entry ! The GUIGadgetInfo structure also provides the possibility of own user data !

Usually the textFont of the GUIInfo structure is used for the gadgets. But it is also possible to override this setting by using the GEG_Font tag.

It is not allowed to specify the gadget's ID. GUIEnvironment gives the first gadget the ID 0, the second the ID 1 and so on !

With the GEG_CreationAHook you can define a hook function for this gadget which is called every time the gadget is created/redrawn ! This is usefull for gadtools GENERIC_KIND gadgets. GUIEnvironment first creates the gadget and then calls your hook function with a pointer to the gadget in the A2 register. If your hook function is not able to do its work, you have to return FALSE, and the creation is stopped, otherwise return TRUE.

Changing gadgets must be done using GUIEnvironment. This includes such things as enabling/disabling gadgets !

SEE ALSO

Gadget description flags

Gadget creation hook

1.3 Creating Gadtools gadgets

CreateGUIGadget does the following replacements for you for the gadget's width and height:

```
CHECKBOX_KIND : if width = 0 then width = GadTools.checkboxWidth
                : if height = 0 then height = Gadtools.checkboxHeight
MX_KIND       : if width = 0 then width = GadTools.mxWidth
                if height = 0 then height = GadTools.mxHeight
```

```

STRING_KIND    : if height = 0 then height = gadget font->ySize + 4
INTEGER_KIND   : the same as STRING_KIND

```

If you use gadget text for a gadtools gadgets you have to use the GEG_Flags tag to define the gadget's text place. Remember to set this tag for each gadtools gadget with text !

You can use every gadtools tag to define the gadget.

GUIEnvironment also offers a notify function for gadtools gadgets. This means you tell GUIEnvironment that a special variable belongs to this gadget and every time a message for this gadget arrives, the variable is updated and contains the new value/state of the gadget.

For this function you have to use the GEG_VarAddress tag. It replaces for each gadtools gadget a different tag as stated below. Don't use the replaced tag together with GEG_VarAddress:

```

STRING_KIND    : GEG_VarAddress replaces GTST_String
INTEGER_KIND   : GEG_VarAddress replaces GTIN_Number, but this tag now
                  must contain the address of a LONG variable !
MX_KIND        : GEG_VarAddress replaces GTMX_Active, but the tag data
                  is a pointer to a UWORD variable !
CYCLE_KIND     : GEG_VarAddress replaces GTCY_Active, but the tag data
                  is a pointer to a UWORD variable !
CHECKBOX_KIND  : GEG_VarAddress replaces GTCB_Checked, but the tag data
                  is a pointer to a boolean UBYTE variable !
SLIDER_KIND    : GEG_VarAddress replaces GTSL_Level, but the tag data is
                  a pointer to a WORD variable !
SCROLLER_KIND  : GEG_VarAddress replaces GTSC_Top, but the tag data is
                  a pointer to a WORD variable !
LISTVIEW_KIND  : GEG_VarAddress replaces GTLV_Selected, but the tag data
                  is a pointer to a UWORD variable !
PALETTE_KIND   : GEG_VarAddress replaces GTPA_Color, but the tag data
                  is a pointer to a UWORD variable !

```

SEE ALSO

Gadget message handling

1.4 BOOPSI gadgets

Using BOOPSI gadgets is very simple. You can define them in the same manner you do it with gadtools gadgets.

You can specify any tag for this gadgets except the following ones which are set by GUIEnvironment: GA_ID, GA_UserData, GA_Left, GA_Top, GA_Width, GA_Height, GA_Previous, GA_DrawInfo.

GUIEnvironment also sets the GA_Text tag with the value of the GEG_Text gadget (or the localized string !).

For private BOOPSI classes the geClass.library is used to get an object of the class, so it is possible to use "shared" private classes.

SEE ALSO

The GEClass Library

1.5 The GUIEnvironment gadgets

GUIEnvironment offers some own gadget kinds which simplify designing a GUI.

But this gadgets are not real gadgets, so don't use the gadget structure created by GUIEnvironment for these gadgets ! Use only the functions provided to access these gadgets !

The only valid entry of the gadget structure is the UserData entry !

These gadgets never cause any message and it is also possible to draw some gadgets inside them !

Creating this gadgets follows the same rules as for gadtools gadgets !

1.6 Gadget description flags

If you want to make your GUI resizable you have two possibilities:

- a) Each time a IDCMP_NEWSIZE message arrives, you calculate the new sizes and positions by hand and then do the resizing with this new values !
- b) You use the gadget description flags together with GUIEnvironment.

Using methode a) is very difficult for you. For this GUIEnvironment offers the possibility of resizing gadgets. See the chapter about modifying gadgets for more information !

The gadget description flags over an object orientated method of defining gadgets.

For each gadget you have to use the GEG_Description tag. The data of this tag says GUIEnvironment how to use the values for the gadget. This means, you say this gadget has a distance to that gadget of 10. In the current version you can specify the distance to other gadgets or to the window borders.

To make the calculation easier you have to define the GUI for a certain window size ! The GUI for other window sizes is calculated out of the new window size in proportion to the certain one !

When now the size of the window changes, GUITools can determine, using these fields, how far the size has changed and recalculate the gadgets. If you want to open your window in a size the user can define, this can easily done in the following way:

- Open the window with the user defined size
- Create the GUIInfo structure with the GUI_CreationWidth and GUI_CreationHeight tags which tell GUIEnvironment the size the GUI was designed for !

The resizing for the user defined window size is then done by GUIEnvironment when you call DrawGUI.

But now the hardest part, the defining of the gadget's positions and sizes ! (If you don't understand this reading the first time, don't give up, because my explanations are not as clearly as I wanted them to be, but take also a look at the demos for resizable gadgets and perhaps you will know what GUIEnvironment can do !)

For every gadget attribute (left edge, top edge, width and height)

GUIEnvironment uses a description byte. This byte consists of three parts:

- 1.) The distance kind:

GEG_DistNorm This is the normal distance, that means the attribute is handled in the same way as without this byte. This distance is for constant positions and sizes.

GEG_DistAbs This specifies the distance to a given object. The size of the window is not regarded. The distance will always be the same.

GEG_DistRel This distance is also a distance from a given object. But if the window size changes, the distance will change in the same way.

GEGD_DistPercent In the first way this does the same as GEG_DistNorm, but if now the window size changes, the distance will change in the same way.

2.) The object kind:

If you use GEG_DistAbs or GEG_DistRel GUIEnvironment needs also the kind of the object the distance is to:

GEG_ObjBorder this is the window border
 GEG_ObjGadget the distance to another gadget

3.) The object part

If you specify the distance to another object, you also have to say to which part of the object.

This can be GEG_ObjRight, GEG_ObjLeft, GEG_ObjBottom or GEG_ObjTop

And that's all ! Really simple, isn't it. But how can you tell GUIEnv these descriptions. For this reason there is the GEG_Description tag. Because every tag has a data value of 32 Bits, it is possible to store the information for all four attributes into one tag ! The highest byte contains the left edge, the next byte the top edge, the next byte the width and the lowest byte the height of the gadget !

To build this information data, you can use the GADDESC macro !

If you specify an attribute's distance to another gadget, normally the previous created gadget is used. If you want to define the distance to a different one, you have to use the GEG_Objects tag.

It has the same structure as the GEG_Description tag except that every byte represents a gadget number. But you can only use gadgets which are already created !

For more information refer to the included example source files !

Here follows a short example: You want to create a gadget, which is 10 points from the left and the top border and which right border is 20 away from the left border of the first created gadget (gadget number 0) and the top border has a distance of 10 points to the second created gadget (with gadget number 1):

```
CreateGUIGadget(GUI, 10, 10, -20, -10, ANYKIND,
                GEG_Description, GADDESC(GEG_DistAbs + GEG_ObjBorder + ↔
                GEG_ObjLeft,
                GEG_DistAbs + GEG_ObjBorder + ↔
                GEG_ObjTop,
                GEG_DistAbs + GEG_ObjGadget + ↔
                GEG_ObjLeft,
                GEG_DistAbs + GEG_ObjGadget + ↔
                GEG_ObjTop),
```

```
GEG_Objects, GADOBJS( 0, 0, 0, 1), NULL);
```

GADOBJS is a macro to build the data for the GEG_Objects tag.

1.7 Localizing gadgets

Localizing the gadgets is very easy:

First, when creating the GUIInfo structure, you have to specify the name of the catalog file for this GUI and the number of the first gadget text within this catalog.

The catalog should be designed in that way, that the gadgets' texts are in straight order.

For example: A catalog for the three button gadgets could look like this:

```
100: Load
101: Save
102: QUIT
```

Using the GUI_GadgetCatalogOffset tag with the data of 100 and the GUI_CatalogFile tag with the file name of the catalog, you don't need to do anything else. The gadgets will appear in the correct language (if a catalog exists).

If the Save and QUIT texts would have the numbers 102 and 101 you would have to use the GEG_CatalogString tag for both gadgets.

For Save you would pass GEG_CatalogString, 102 and for QUIT GEG_CatalogString, 101.

With each call to CreateGUIGadget the catalog string number is increased by one. You could check the gadgetCatalogOffset entry of the GUIInfo structure for the current value.

1.8 The gadget help function

If the AmigaGuide is installed and if you have turned on intuitions gadget help function, GUIEnvironment displays the node specified in the GUIGadgetInfo structure for each gadget if a IDCMP_GADGETHELP message arrives.

Usually CreateGUIGadget creates the node names for you, this means every gadget gets a node labelled GADGET followed by the gadget ID, this means the first gadget gets the node name GADGET0, the second GADGET1 and so on.

If you want to have different node names, use the GEG_GuideNode tag. The application will get a IDCMP_GADGETHELP message, if the help function was activated outside the window (msgGadget == NIL) or inside the window, but not over any gadget (msgGadget == &Window). Also, the help messages for system gadgets are passed to application. The msgGadNbr field will then contain the gadget type !

SEE ALSO

- The GUIGadgetInfo structure
- The gadget tags

1.9 Special gadget features

For gadtools gadgets GUIEnvironment offers the possibility of notification. This means, you give a gadtools gadget a variable and GUIEnvironment updates this variable with the state of the gadget with every message !

Chaining gadgets

GUIEnvironment offers the possibility of chaining gadgets. This means if you have finished giving input to one gadget, the next gadget is automatically activated. This is very usefull for several text entry gadgets which can now be chained, so that the user switches between the gadgets simply by pressing RETURN, so he won't need the mouse to do so !

You can specify the following flags as data (using GEG_ChainActivation)

- GEG_ChainUpNext : If the gadget gets an up message, activate the next gadget with the up function.
- GEG_ChainUpPrev : If the gadget gets an up message, activate the previous gadget with the up function.
- GEG_ChainDownNext : If the gadget gets an down message, activate the next gadget with the down function.
- GEG_ChainDownPrev : If the gadget gets an down message, activate the next gadget with the down function.

You start the chaining with the GEG_StartChain tag (use 0 as data !), and you end chaining with the GEG_EndChain tag. If you here specify TRUE as tag data, the gadgets are chaining in a cycle, this means this last gadget activates the first gadget and vice versa.

Activation on startup

If you specify the GEG_Activate tag, the gadget is activated when the GUI is drawn. You can specify GEG_ACTIVATIONUP or GEG_ACTIVATION_DOWN as tag data. This determines if the up or down function is called. The activation is usefull for gadtools text entry gadgets which can be activated on startup, so the user can immediately enter the text without using the mouse !

SEE ALSO

Gadtools gadgets

1.10 Gadget action

The GUIGadgetAction function offers a efficient possibility to do some work on several gadgets without only one command !
The action tags get the gadget number/ID sa tag data or you can define GEG_ALLGADGETS as data, if you want to affect all gadgets.
If you e.g. want to disable all gadgets but not the second gadget (ID=1), you could do this:

```
GUIGadgetAction(GUI, GEG_Disable, GEG_ALLGADGETS, GEG_Enable, 1, TAG_END);
```

The GEG_SetVar and GEG_GetVar tag offer together with the notification method a very simple way of setting and getting gadgets' states !

SEE ALSO

The gadget tags

1.11 Gadget message handling

With the IDCMP_GADGETUP, IDCMP_GADGETDOWN or the IDCMP_MOUSEMOVE message GUIEnvironment sets the msgClass, msgGadget and the msgGadNbr field of the GUIInfo structure with the appropriate information !

If you set the notification for a gadtools gadget, the following steps are done:

| IDCMP message | | action |
|------------------|---|---|
| IDCMP_GADGETUP | CHECKBOX_KIND | Updates the belonging variable. The msgBoolCode entry will get the state of the gadget. (It will get the state even if the notification is turned off) |
| | CYCLE_KIND, SLIDER_KIND, SCROLLER_KIND, LISTVIEW_KIND, PALETTE_KIND | Update the belonging variable. Usually there will be no need to check these messages. It is sufficient to check the values of the variables when they are required. |
| IDCMP_GADGETDOWN | MX_KIND, SLIDER_KIND, SCROLLER_KIND | Update the belonging variable. Usually there will be no need to check these messages. It is sufficient to check the values of the variables when they are required. |
| IDCMP_MOUSEMOVE | SCROLLER_KIND, SLIDER_KIND | Update the belonging variable. Usually there will be no need to check these messages. It is sufficient to check the values of the variables when they are required. |

If the gadget wasn't a gadtools gadget with notification, now the up or down function is called, depending on the incoming message. If this function returns TRUE, the application will get the message, otherwise not !
If the gadgets are chained, now the next/previous gadget will be activated.

SEE ALSO

Gadget help function
Chaining gadgets
Key equivalents
Gadget event hook

1.12 Gadget Key Equivalents

GUIEnvironment supports key equivalents for gadtools gadgets as noted in the Libraries RKRK ! The only difference is with BUTTON_KIND gadgets: Usually there's no difference if the shifted key was pressed or the unshifted, GUIEnvironment distinguishes these facts !

All key equivalents which are letters ranging from 'A' to 'Z' are handled automatically ! For all other characters you can specify a hook function: (using the GUI_VanKeyAHook tag)

Example: Imagine, you want to program your own hypertext tool. Despite of a lot of other gadgets and menus you have a 'Browse _>' and a 'Browse _<' gadget. The first one has the ID 5 and the second one the ID 6.

Your hook function could look like this:

```
LONG KeyFctDemo(register __a0 struct Hook *hook,
                register __a2 LONG key,
                register __a1 APTR unused)
/* We don't need __saveds , because no global data is used and
   GUIEnvironment sets the A4 register for us ! */
{
    LONG ret;
    ret = GEH_KeyUnknown;
    if (char(key) == '<')
        ret = 5; /* gadget number 5 */
    if (char(key) == '>')
        ret = 6; /* gadget number 6 */

    return (ret);
}
```

If now a IDCMP_VANILLAKEY message appears and the character is a key equivalent, GUIEnvironment converts this message to a gadget message ! (This means, the msgClass and msgCode entries are changed, but not the intuitMsg field !)

The msgGadNbr and msgGadget fields are set also.

For the gadtools gadgets it does the following substitutions:

| gadget kind | action |
|------------------------------|---|
| BUTTON_KIND | msgClass = IDCMP_GADGETUP msgCode = 0 If the key was pressed with shift: msgClass = IDCMP_GADGETDOWN |
| STRING_KIND, INTEGER_KIND | activates the gadget for input msgClass = gadgetDown msgCode = 0 |
| CHECKBOX_KIND | changes the state |

| | |
|-------------------------------|--|
| | msgClass = IDCMP_GADGETUP msgBoolCode contains the new state |
| MX_KIND | choose the next value without shift and with shift the previous one msgClass = IDCMP_GADGETDOWN msgCode = new entry number |
| CYCLE_KIND | choose the next value without shift and with shift the previous one msgClass = IDCMP_GADGETUP msgCode = new entry number |
| SLIDER_KIND, SCROLLER_KIND | without shift one position forward, with shift one backwards msgClass = IDCMP_GADGETUP msgCode = new position (new level resp new top) |
| LISTVIEW_KIND | without shift next entry, with shift the previous one. If no entry wasn't selected yet, without shift the first and with shift the last one is selected. msgClass = IDCMP_GADGETUP msgCode = new entry number |
| PALETTE_KIND | without shift the next colour will be selected, with shift the previous one. msgClass = IDCMP_GADGETUP msgCode = new colour number |

After this substitution the event is handled as a real gadget event, so see the chapter about gadget message handling for more information about the things happening now !

SEE ALSO

- Gadget message handling
- The vanilla key hook

1.13 Setting and getting gadget attributes

GUIEnvironment offers the SetGUIGadget function to set gadget attributes. You can pass all attributes which are defined in GUIEnvironment for setting gadgets (See the gadget tag list), all tags for gadtools gadgets and also the special tags for BOOPSI gadgets.

You can use the GEG_Status tag to disable/enable all gadget kinds !

But don't use the GA_Left, GA_Top, GA_Width, GA_Height tag. Use the ones GUIEnv offers instead.

If you want to affect more than one gadget use the GUIGadgetAction function !

With the GetGUIGadget function you can get all above mentioned tags ! But remember you can only get gadtools attributes if you have version 39 or above of the gadtools.library installed !

With the GEG_Address tag you get a pointer to the gadget structure !

SEE ALSO

The gadget tags
Gadget Actions

1.14 The GUIGadgetInfo structure

The UserData entry of each gadget is set to a GUIGadgetInfo structure. This structure is read only. The entries can be changed using the SetGUIGadget function together with the gadget tags.

```
struct GUIGadgetInfo
{
    APTR userData;

    Use this for own user data.

    LONG kind;

    The gadget kind.

    APTR gadgetClass;

    Pointer to the gadget class if the gadget is a BOOPSI gadget.
    If the class is public this is a string pointer, otherwise this
    is a pointer to a Class structure.

    struct Hook functionUp, functionDown;

    Hook functions called with IDCMP_GADGETUP/IDCMP_GADGETDOWN
    messages.

    STRPTR guideNode;

    Pointer to an AmigaGuide node which is displayed with a
    IDCMP_GADGETHELP message.

};
```

SEE ALSO

The gadget tags

1.15 The gadget kinds

Apart from the gadtools gadget kinds GUIEnvironment does also know the following gadget kinds:

GEG_ProgressIndicatorKind

This gadget offers a beam, e.g. to show howfar the progress has come.

With this gadget you can use the following tags:

GEG_PIMaxValue

The maximum value of a progress indicator kind. The value of 100 is very useful, because then it is easier to specify the progress in per cent.

GEG_PICurrentValue

The current value of a progress indicator kind. This is the percentage of the progress. It shows how much is done yet.

These tags can be used for creation and modification.

This gadget also provides a gadget text, but it is not allowed to write the text inside the gadget. Because this gadget never sends messages, there is no need of having a key equivalent and so there should not be an underscore in the gadget text !

GEG_BevelboxKind

This gadget shows a bevelled box, which can either be raised or recessed.

When creating you can specify the following tag:

GEG_BBRecessed

Should the bevelled box be recessed or not.

Don't use gadget text together with bevelled box gadgets. Because this is not a real gadget as mentioned above, it is possible to show gadgets inside this gadget ! So you can draw a border around other gadgets !

Using this gadget instead of a real bevelled box, simplifies such things as resizing GUIs and refreshing !

This gadget never causes a message !

GEG_BorderKind

This gadget draws a border.

This gadget supports gadget text which can only be placed above or below !

Because this is not a real gadget as mentioned above, it is possible to show gadgets inside this gadget ! So you can draw a border around other gadgets !

This gadget never causes a message !

GEG_BOOPSIPublicKind

A BOOPSI gadget which uses a public class.

GEG_BOOPSIPrivateKind

A BOOPSI gadget which uses a private class. The `geclass.library` is used to get this object.

1.16 The gadget tags

C : Creation
S : Set / Changing
A : Action
G : Gettable

GEG_Text C

The gadget text.

GEG_Flags C

Gadget flags only for gadtools gadgets.

GEG_Font C

The gadget font.

GEG_UserData C S

Own user data.

GEG_Description C

Gadget description tag for resizing.

GEG_Objects C

Gadget description tag for resizing.

GEG_GuideNode C S

The AmigaGuide node to display as help text.

GEG_UpAHook C S

IDCMP_GADGETUP function.

GEG_DownAHook C S

IDCMP_GADGETDOWN function.

GEG_CatalogString C

Number of the string in the catalog for the gadget's text.

GEG_Class C

Gadget class for BOOPSI gadgets.

GEG_VarAddress C
Address of a variable for notification of gadtools gadgets.

GEG_HandleInternal C
Handle all messages for this gadget internal if possible.

GEG_StartChain C
Start chaining gadgets.

GEG_EndChain C
End chaining gadgets.

GEG_Activate C
Activate gadget every time it is drawn.

GEG_ChainActivation C
Chain activation flags.

GEG_CreationAHook C
Gadget creation hook.

GEG_PIMaxValue C S G
Progress indicator kind: Maximum value.

GEG_PICurrentValue C S G
Progress indicator kind: Current value.

GEG_BBRecessed C G
Bevelled box kind: Recessed or not.

GEG_Disable A
Action tag: Disable gadgets.

GEG_Enable A
Action tag: Enable gadgets.

GEG_SetVar A
Action tag: Set gadgets to variable contents (needs notification)

GEG_GetVar A
Action tag: Get variable values from gadgets (needs notification)

GEG_ActivateUp A

Action tag: Call up function

GEG_ActivateDown A

Action tag: Call down function

GEG_Address G

GEG_LeftEdge S G

Gadget left edge.

GEG_TopEdge S G

Gadget top edge.

GEG_Width S G

Gadget width.

GEG_Height S G

Gadget height.

GEG_Redraw S

Boolean tag: Redraw the gadget immediately if the new size/position
is set. (Default: TRUE)

If you set this to FALSE, you can first define new sizes for all gadgets
and then redraw/resize them using DrawGUI.

GEG_Status C S G

This is a replacement for the intuition GA_Disabled tag. But this tag
works for ALL gadgets and the data specifies if the gadget is active
and not if it is disabled as the GA_Disabled tag does !

1.17 rcs

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