

Installer

Jens Tröger

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COLLABORATORS

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Chapter 1

Installer

1.1 The Installer Language Programming Guide

The Installer Language Programming Guide

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Preliminaries

Introduction	What's this thing about
Author	The author of this guide and the InstallerNG
C= Installer vs. InstallerNG	Old contra new
Versions of Installer	Keep this in mind!
Installation	Installing the Installer

First Steps

Hello World	Our first working programm
The language	Introduction to the language
Starting the Installer	How to start this tool

Programming secrets

Symbols	The bricks of a script
Syntax	Rules for programming
Builtin variables	The predefined variables
Function reference	All the functions of the Installer
Custom functions	How to use custom functions
Enhanced string formatting	Building strings from arguments
Grouping of functions	Joining several functions to a block
Types	The different types
Errors	Compilation errors

References

Formal information	Some theoretical stuff
You should read this	This has to be respected
All functions	All functions in alphabetical order

1.2 Introduction

Today, the installation of software products can be a very complex procedure. This is caused by the sometimes large set of different files or a very lowlevel intervention into the systems resources. Especially for novice users this process can be difficult and the system may be destroyed (worst case...).

This was the motivation for Commodore to build a tool, which covers the installation process and offers an easy to use and graphical interface. This thing was called the Installer. The user just tells where and what to install and the Installer cares for the installation process itself, i.e. the Installer checks for the versions, copies the files to the correct destinations, sets up a correct environment for the installed tool and so on. The user can choose, whether he wants an easy installation (means, as less as possible queries) or if he wants to get notified for every action.

If you are a programmer and you want to provide your user such an easy installation, you must write an Installer-Script. This script is simply a textfile and contains a programm, written in a special language. This language is simple and offers very much functions for querying the user, for setting and getting system properties, for file handling, string manipulation and, last but not least, a lot of mathematical functions. Furthermore, put an icon into your archive, which contains special tooltypes (for tooltypes please refer to your workbench guide) for the Installer. When the user double-clicks this icon, the Installer will get started and then looks for your script to execute it.

This guide will introduce you the Installer usage itself and the script language. You should have programmed and, additionally, should have some knowledge about the AmigaDOS. If not, use this course for starting your programming career....

1.3 That's me ;)

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1.4 C= Installer vs. InstallerNG

If you know the C= Installer, you should have noticed its ugly interface, the amount of failures and the bad useability. If you have already programmed the C= Installer, you know that the language isn't up to date anymore. That's why I started to implement a new Installer: the InstallerNG. This new Installer looks really nice, has nearly no bugs and runs very stable. For the programmer, it offers new and also enhanced functions. For a list of all the new things look here.

Since the InstallerNG is fully compatible to the C= Installer (at least to the new Installer of the AmigaOS 3.5) this guide remains valid for both Installers! The language of the C= Installer can be seen as a subset of the InstallerNG's language and I will note, whether the C= Installer understands a specific `←` function or not by a {NG}. So it does not matter, if I talk about the InstallerNG or the C= Installer - both are meant, when I say Installer.

Some may be upset about the fact, that scripts run into errors, even if these scripts did work fine with the C= Installer. This is not the fault of the `←` InstallerNG.

The C= Installer is very lazy - it does no checks, accepts very much errors and did never notify the programmer/user about errors. The InstallerNG is definitely not lazy and reports errors!

1.5 Versions of the Installer

I think, there are three important versions of the Installer

older than 42.9/42.12

You can be sure, that every Installer has at least version 42.9/42.12. These versions extended the old language by some new features and functions. I guess, when you program a script, you can be sure that this script runs at least version 42.12, since this was the last official release. But a version check would be safe.

44.10 (AmigaOS 3.5)

This version comes with the new AmigaOS 3.5 and was done by Jochen Becher (Haage & Partner). He just added some new functions to the Installer language which support multimedia files and a simple backtrace mechanism.

44.10 (InstallerNG 1.4)

My InstallerNG is compatible to the latest version of the original Installer. The scripts run without problems, but the programmer can make use of the new functions of the InstallerNG.

1.6 The installation of the Installer

The Installer is a system tool and, thus, can be found in your C: drawer. For those who want to use my InstallerNG (recommended!) - just double-click at the Install icon and follow the steps.

In fact, it does not matter where the Installer can be found as long as it resides in the systems path.

1.7 What's new for the InstallerNG

Here you find all the things I added to the InstallerNG and, thus, which features ↵

are not supported by the old Installer. So if you want to use these new features and run the script on the original Installer you may run into errors. That's why a version check is very important!

No restrictions

The original Installer cannot handle larger strings (currently, I don't know ↵ what is meant by "larger" strings...). With the InstallerNG a string (and the value ↵ of a string variable too) can be as long as it fits into your memory.

Nice GUI

The builtin-gui is based on a BOOPSI class-collection, which was also written by me; these classes allow easy font-adaption, resizing and support the ↵ MagicWB pens. Additionally, you may "plug-in" other gui-systems (like MUI, BGui, ...) via a shared library named "installergui.library". This archive also contains ↵ the interface definition, such that anyone could program a custom gui for my ↵ InstallerNG.

Furthermore, the help window can stay open, while you install your packages; this is a builtin feature and should be provided by every GUI.

Comfortable WB-Start

If you run the InstallerNG from WB and give it no script via tooltypes a requester pops up which asks you whether you want to load a script by a file-requester or if you want to app-iconify the installer. If you drop a script-file on the application icon the InstallerNG gets started.

Returncode

The InstallerNG returns RETURN_OK (0) if everything of the installation went fine, or, in case of an error, it returns RETURN_FAIL (20). This could be useful, if you call the InstallerNG from a script and the script wants to check whether the InstallerNG was successful or not.

Flexible interpretation

If an error raises while the interpretation process, the InstallerNG provides to continue at the very next function. Please be careful with this option, because going on may lead to some other errors, but often it's really useful ↵ to finish the (uncomplete) installation.

New builtin variables

@installer-ng-version -- the version of the InstallerNG
@proceed-button -- holds the text for the "Proceed with install"-button

Constants

- TRUE/DOSTRUE and FALSE/DOSFALSE are now constants and cannot be modified
- NOVICE, AVERAGE and EXPERT are builtin constants, so you can use them instead of 0, 1 and 2 (usefull for CONFIRM and USER functions)

New Tooltypes/CLI-Arguments

LAZYCOMPILE: if set, then the InstallerNG is as lazy as the C= installer is. that means, InstallerNG skips its semantic check procedures to be more compatible

DEBUGMODE: if set, then InstallerNG will switch on it's debugmode

CREATEUNINSTALL=CUI: if set, then InstallerNG creates an uninstall skript

COPYFILECOMMENT=CFC: if set, every copied file will be commented with the package name

ALWAYSCONFIRM: if set, every action has to be confirmed in every user-level!

NOSYSDELETE: if set, calls to DELETE from system drawers will be ignored

Interuptable Interpretation

The InstallerNG can be interupted everytime by sending the CTRL-F signal to its process. This option allows to break out of infinite loops.

Local environments

Everytime you want to, you are allowed to create a new environment (i.e. to declare several new variables). Inside this environment you can run some code, which uses the local variables prior the global ones. See the function LET for more details.

SOOP - Simple Object Oriented Programing

With help of the new functions PUT-PROPERTY, GET-PROPERTY and REMOVE-PROPERTY the InstallerNG implements LISP-like property-lists for symbols. Imagine of a symbol as an object and the properties as the objects attributes. Furthermore, if you write PROCEDURE's, which are able to operate on an object's attributes, you just can produce simple OO code :) ...without a class hierarchy, but object oriented!

UNDO-REDO environments

Using the function SWING you are able to build an environment, in which you can "swing" from one (topmost) function to the next. When reaching the last one, the installation may proceed. This looks/works much like the MS-Setup program :)

With v44 of the C= installer, you are able to simulate such an environment by special TRACE and RETRACE functions and the BACK parameter

Full installation control

If you want to, the InstallerNG asks for confirmation of every action, no matter what the script-programmer codes in his installer script

AppWindow

InstallerNG can now act as an socalled "AppWindow", i.e. you may drop files into the window and InstallerNG uses them. This only works, when the InstallerNG asks for a file or directory (see ASKFILE, ASKDIR)

Enhanced Functions

DATABASE
EXISTS

New Functions

BEEP
COMPARE
DELAY
FINDBOARD
LET
NOP
RANDOM
REBOOT
SETENV
SIMULATE-ERROR
SWING

GET-PROPERTY
PUT-PROPERTY
REMOVE-PROPERTY

1.8 'Hello World' - the first working program

Now let's write our first program for the Installer. Run an editor (something like GoldED, even the ED command of your shell is good enough) and just write the following line:

```
(message "Hello world")
```

Save this as "t:helloworld" and open a shell window (see your Workbench manual for help). Type "installer t:helloworld" and press enter. The Installer should open a window, which asks you, if you are "Novice", "Average" or "Expert". Select "Expert" and press the "Proceed" button. Currently, just ignore the next panel and press the "Proceed" again. Now you should see our "Hello world" text. Quit the Installer by pressing the "Proceed" button again.

Thats all... you did it!

1.9 The language - an overview

Have a look at the Hello World program to see a very small but legal script. The language has a very simple structure. Some may say, it is LISP but

they are wrong (LISP is an old dirty-functional language). It may look so, but ↵
 has
 nothing in common.

A script consists of a collection of functions. A function just starts with an opening bracket, followed by the functions name and several (or maybe zero) arguments for this function and ends with a closing bracket. Examples for such functions are

```
(+ 5 2) ; just add 5 and 2
(message "really simple, isn't it?!") ; show a message
```

You see, comments start with a semi-colon and end with the end of the line. The InstallerNG also supports multi-lined comments, which are enclosed in `"/*"` and `"*/"` (like comments in C). Furthermore, the Installer does not care for upper or lower letters!

It may look strange to you, that we write the function symbol at first, followed by its arguments. In mathematics this style is called "prefix notation". ↵
 Everyone
 knows "infix notation" - the school-like addition is infix, because we write the functional symbol between its arguments. Of course there is also an "postfix notation", guess, how this looks like!

Every function delivers a result and this result has a type. This makes the it possible to use every function as argument to another function, if the types are valid. This means, you cannot use a function, which evaluates to a string result, as argument to a function which expects a number argument. A runtime error will be produced in such cases. Try to calculate the result of this expression:

```
(+ 1
  (+ 2 3)
  4
  (- 5
    (* 2 3)
    (/ 9 3)
  )
)
```

Of course we need variables! A variable can be declared by using the SET function:

```
(set #number 5)
(set #string "hello")
```

The first SET defines a variable "number" of type NUMBER and gives it the value 5. The second function defines a variable "string" of type STRING and the value of this variable will be the string "hello". You see, the Installer ↵
 distinguishes

exactly two types: the numbers and the strings. Later, we will add a new type, ←
 but
 for now, this is quiet enough. Additionally, the Installer offers several builtin
 variables, which hold information about the current Installer environment. The
 script can use these variables as they were defined by the user. It is a ←
 convention,
 that builtin variables start with "@" and the user defined variables with "#", ←
 but
 this is definitely no must!

A script can become very large. In such cases it would be useful to have custom
 functions for maybe version checks, copying end so on. You can define your own
 functions by using the PROCEDURE function. A user defined function should start
 with a "P_" to avoid collisions with later extension to the builtin function set ←
 .

```
(procedure P_Error #errobjct #errcode
(
  (beep) {NG}
  (message "Error #" #errcode " with " #errobjct)
  (exit (quiet))
)
)

..

(P_Error "my_file" 5)
```

This defines a function "P_Error" which expects two arguments: #errobjct and
 #errcode. You can invoke such functions, just as they were builtin - simply call
 them.

1.10 How can I start the Installer

Just like nearly every other Amiga tool, you can start the Installer either
 through a shell or from Workbench.

1.11 Running from Shell/CLI

The Installer can be started by simply typing its name and the script file. The
 script file argument is the only one argument, which you must specify! Every
 other argument is optional. This is the argument template of the InstallerNG:

```
SCRIPT/A,APPNAME/K,MINUSER/K,DEFUSER/K,LOGFILE/K,LANGUAGE/K,  

NOPRETEND/S,NOLOG/S,NOPRINT/S,LAZYCOMPILE/S,DEBUGMODE/S,  

CREATEUNINSTALL=CUI/S,COPYFILECOMMENT=CFC/S,ALWAYSCONFIRM/S,  

NOSYSDELETE=NSD/S
```

APPNAME specifies the name of the application you want to install. Usually
 this is the name of your tool. MINUSER sets the minimal operation mode for

the Installer and DEFUSER presets the operation mode. The user may change the operation mode by selecting a mode in the first welcome panel (refer to the WELCOME function). Use LOGFILE to set the file, which will be handled as an installation protocol or set NOLOG, if you want to forbid any logging actions. NOPRINT disables the logging to the standard printer. If you set NOPRETEND then the user cannot turn on the pretend mode. In pretend mode, the Installer just simulates an installation process. The LANGUAGE specifies the language, which should be used in the script.

The rest of the arguments is valid only for the InstallerNG and they set the "Advanced options". LAZYCOMPILE turns off any check procedure at startup and the InstallerNG does not look for errors during compilation. DEBUGMODE turns on the debug console and prints useful warnings. Use CREATEUNINSTALL to produce an uninstall script from the current installation session. If you run this produced script again with the Installer, it will de-install the package. COPYFILECOMMENT just comments every copied file with the name of the current application name (see APPNAME argument) by appending the old file comment to the application name. For full installation control, you should set the ALWAYSCONFIRM argument, which forces the Installer to ask for confirmation everytime. NOSYSDELETE avoids the deletion from system drawers like C: or LIBS: or whatever...

1.12 Running from WB

If you run the Installer from Workbench, you can set up a working environment for it by specifying tooltypes. ↩

```
SCRIPT=<scriptfile>
APPNAME=<name>
MINUSER=<novice|average|expert>
DEFUSER=<novice|average|expert>
LOGFILE=<logfile>
LANGUAGE=<language>
PRETEND
LOG
NOPRINT
ICONIFY {NG}
LAZYCOMPILE {NG}
DEBUGMODE {NG}
CREATEUNINSTALL {NG}
COPYFILECOMMENT {NG}
ALWAYSCONFIRM {NG}
NOSYSDELETE {NG}
```

Except the ICONIFY tooltype, these tooltypes are equal to the shell arguments and, ↩
thus, I do not write the meaning here again.

ICONIFY holds, if you give no SCRIPT argument. Usually, the Installer would ask, whether the user wants to load a script or just iconify the Installer. Using ↩
this
tooltype forces the Installer to immediately iconify.

1.13 The types of the Installer

The Installer distinguishes between two main types: `STRING` and `NUMBER`. Additionally, the parameter functions do not return any of these main types, but a `PARAM` type just to notify, that such a parameter function was executed.

Now forget about the `PARAM` type, it is internally. Only work with the `STRING` and `NUMBER` types!

1.14 The Errors

To understand these errors think of the syntactical structure of any program:

A program consists of one or more functions or function lists. An expression can be either a number, a string, a variable or a new function. Functions are `↔` enclosed in paranthesis, the first symbol can be anything but a number and a function-specific number of arguments. An argument can be again any expression.

Syntax Errors

(expected
The Installer needs a new function

(or function expected
The Installer needs the beginning of a new function or the name of a function. (you may have wrote a number)

Function not allowed here
A function-name (like `ASKFILE...`) is used as a parameter to any other function. Remove this or enclose it with parenthesis.

Unexpected EOS
The end of the source was reached to early. Maybe a missing close- `↔` parenthesis leads this error.

Expression expected
Any expression is needed here.

Functional expression needed
The first expression behind opening parenthesis must be an identifier or a string. What you wrote is maybe a number.

) expected
You forgot a ")" ???

1.15 The Installer Language

The language used by the Installer is a simple, imperative language. Since I like functional languages, I tried to give this language a "functional"

touch, i.e. every expression can be evaluated and returns a typed result. Furthermore I started to make the language a bit type stronger, because types are very needful for preventing errors. But don't panic, this language is definitely not functional (it has side-effects!) and very easy to use.

Imagine of the Installer as the Interpreter of a given script. Interpreter means
 the Installer first looks at the whole program (i.e. the script) and then
 fetches
 the first function, evaluates it and maybe uses the result as an argument for
 the
 next function, then it gets the next function, evaluates it... and so on. For
 more
 detailed information see section Technical You may have noticed the syntax:
 it may look strange to some, but it is a simple prefix notation. "Prefix" means,
 that the functional symbol is at first position, followed by its parameters.
 Every
 function must be enclosed by parenthesis. For example to simply add two numbers,
 you must write: (+ 2 3)

A complete list of all functions you will find here. Of course you find
 everything
 of a good imperative language: conditionals, variables, a big set of built-in
 functions, the ability to define custom functions and much more.

Since the original Installer does not offer all the things I wanted to use, I added some more functions and features. See the What's New section for more information.

NOTE: everytime I talk about a string or a number value, you are allowed to use an identifier of type string or number or an expression (function, function list) which delivers a result of type string or number.

- Symbols
- Syntax
- Builtin functions
- Builtin variables
- Advanced features

1.16 The symbols of the language

Symbols are the bricks of every programming language. A variable, a number or even the keywords are the symbols (also called: tokens) of a language. By writing a meaningful sequence of symbols, you just write your program. Here you will find the symbols for the Installer programming language. This is not a formal definition, but I think it is useful.

Spaces

Spaces are the characters between other symbols and are skipped, when the InstallerNG scans the script-file. Every character with an ASCII less or equal 32 gets handled as a space.

Parenthesis

Parenthesis are used to enclose functions and function lists. Only "(" and ")" are legal for that.

Strings

A string is enclosed in either `"..."` or `'...'` and must not contain linefeeds. Special characters start with a backslash, followed by the character, which should appear in the string itself:

```
\0      for a NULL character (ASCII-0)
\b      beep (ASCII-8)
\t \h   tabulator (ASCII-9)
\n      linefeed (ASCII-10)
\v      ? (ASCII-11)
\f      ? (ASCII-12)
\r      carriage return (ASCII-13)

\\      for a backslash itself

\o      octal encoded number
\x      hex encoded number

\"      to use a " inside of a "..." string
\'      to use a ' inside of a '...' string
```

```
Example: "string"
         "first line\nsecond line"
         "numbers are: 123 \o70 \xffff"
         "string 'cite'"
         "string \"cite\""
         'string "cite"'
         'string \'cite\''
```

Numbers

There are three types of numbers:

```
binary: starting with "%" and followed by a sequence of "0" and "1"
decimal: starting with a number or a "+" or a "-" and followed
         by a sequence of "0"..."9"
hex: starting with "$" and followed by a sequence of "0"..."9"
     and "a"..."f" (lower or upper case allowed)
```

```
Example: -4 +53 23 %101011 $A35B
```

Identifiers

Functions

Functions are character sequences (like variables), but the Installer ↔ identifies them as function sybols. See the builtin functions section for which symbols are reserved. Case insensitive.

```
Example: < >= / AND ASKFILE
```

Variables

Are character sequences, which are not builtin functions. Note, that only ↔ the first 32 characters count! Case insensitive.

```
Example: #bla ____*A^ popopop
```

Comments

Single line comments start with a semicolon ";" and end with a return (ASCII ↵ -10)

Multi lined comments can be enclosed in "/*" and "*/" and may contain anything but a EOF (ASCII-0). Note, that multi lined comments are new with the ↵

InstallerNG

and NOT supported by the C= Installer!

Example: ; single lined comment

```
/*
    multi lined comment
*/
```

1.17 The layout of the language

Defining the syntax for a programming language means to say, which sequences of symbols build a correct source code. It does not make sense to write some numbers and variables -- the Installer has specific rules for which symbol must follow another symbol. You know, that a function must be enclosed in brackets and can have some arguments. This is a syntactical rule for the Installer programming language. This syntax definition does whether define the types of ↵ the

arguments nor the legal count of arguments for the functions! This so called "context sensitive" check can be done after the syntax check, or can be skipped by specifying the LAZYCOMPILE option at startup.

Below you find both, an informal and a formal syntax definition.

Informal

A legal script contains at least one function. A function opens with a "(" followed by the functional symbol (this is called "prefix notation") followed by zero or more argument expressions; a function ends with a ")". A valid expression can be either a number, a string, an identifier or a function again. In addition, you can group a collection of functions by ↵ enclosing them again with brackets.

Formal

Below you find the EBNF description:

```
<prog>      ::=  [ <func> ]+

<func>      ::=  "("  "IDENT"  [ <expr> ]* ")"
                |  "("  "STRING" [ <expr> ]* ")"
                |  "("  [ <func> ]+ ")"

<expr>      ::=  "NUMBER"
                |  "STRING"
                |  "IDENT"
                |  <func>
```

For a definition of the symbols NUMBER, STRING and IDENT see the

Symbols section.

1.18 Builtin variables

The builtin variables are declared and initialized by the Installer itself at startup. They hold useful information about the environment, in which the script will execute or you can modify the environment by setting these variables. A script can use these variables just like custom ones and may, for instance, `← localize` the texts. If you set a new value for some variable, you must care for its type, otherwise the script may run into runtime errors.

@abort-button

The text, which should be used for the "Abort installation" button

Default: "Abort installation"

Type: STRING

@app-name

Name of the application to install. This will be used for the "Comment every `← File` with Packagename" option too.

Default: "user-application"

Type: STRING

@icon

The path and name of the script, i.e. the icon, where the Installer was `← started` from (WB start) or the full path to the script when started from shell.

Default: the script, even

Type: STRING

@execute-dir

The working directory for the commands started with RUN or EXECUTE

Default: "" (should be the scripts dir)

Type: STRING

@default-dest

The Installer's suggested location for installing an application. If you `← installed` the application somewhere else (as the result of asking the user) then you `← should` modify this value -- this will allow the "final" statement to work properly.

Default: "Work:"

Type: STRING

@language

The language, which is currently used by the Installer. This depends on the `← preferred` system language and the available catalog file

Default: "english"
Type: STRING

@pretend

The state of the "pretend" flag (1 for pretend)

Default: 0 or set by startup-args
Type: NUMBER

@proceed-button {NG}

This holds the text for the "Proceed with Install"-button. Use this to ↵
customize
the button text. Useful if you run uninstall-scripts

Default: "Proceed with Install"
Type: STRING

@user-level

The user level, which is the Installer running on. (0 for "Novice", 1 for " ↵
Average",
2 for "Expert"). Note: this can be set by the USER function, do not use SET
for this case!
Note: the InstallerNG offers the builtin constants NOVICE, AVERAGE and
EXPERT for a easier usage.

Default: 0 or set by startup-args
Type: NUMBER

@installer-version

Current version of the Installer. Note: this does not equal the version of the
InstallerNG!

Default: 0x002c000a (which is a 44 in the upper word and a 6 in the lower one)
Type: NUMBER

@installer-ng-version {NG}

This holds the current InstallerNG version. By testing this value against zero ↵
,
you can determine whether you run on the old Installer (zero) or the ↵
InstallerNG
(not zero)

Default: 0x00010004 (which is 1 in the upper 16 bits and 4 in the lower)
Type: NUMBER

@error-msg

The text that would have been printed for a fatal error, but was overridden by ↵
a
trap statement.

Default: ""
Type: STRING

@special-msg

If a script wants to supply its own text for any fatal error at various points ↵
in

the script, this variable should be set to that text. The original error text will be appended to the special-msg within parenthesis. Set this variable to "" to clear the special-msg handling.

Default: ""
Type: STRING

@ioerr

In case of a DOS-error, this variable holds the error-code.

Default: 0, set by every DOS error
Type: NUMBER

@each-name

@each-type

Name and type (file or directory) of the currently examined file of the FOREACH function

Default: depends
Type: STRING/NUMBER

@askoptions-help

@askchoice-help

@asknumber-help

@askstring-help

@askdisk-help

@askfile-help

@askdir-help

@copylib-help

@copyfiles-help

@mkdir-help

@startup-help

The builtin help texts.

Default: depends
Type: STRING

1.19 Builtin functions

The Installer provides a large amount of functions for nearly everything you want. You can query the user, examine the system, manipulate files, run scripts and programs, you can show effects (needs the datatypes) and last but not least you have many functions for calculating stuff.

The InstallerNG offers some more functions which (I guess) are hardly needed today. These functions are marked with {NG}. Furthermore, the InstallerNG enhanced some functions without losing compatibility. These enhancements are noted by {+}.

With the new AmigaOS 3.5 the Installer offers some more functions. These functions are also supported by the InstallerNG and are marked with a {44.6} (which is the minimum version of the new Installer of the AmigaOS 3.5).

Note: the specification of the arguments (if any) uses a special notation -- i.e. [arg]⁺ means several arguments, but at least one has to be given; [arg]^{*} means that this function can have zero or more arguments and [arg]{n-m} (or even [arg]{n}) means n 'til m (even only n) arguments. For simplification, I write just [arg] to denote only one argument.

Conditional

These functions control the working flow of your script. Using conditions you can decide where to continue the script execution. Note, that for `←` conditions,
an empty string will be interpreted like the number zero: as FALSE

```
IF
SELECT
UNTIL
WHILE
```

Multimedia and visual support

For an entertaining installation, the new Installer provides functions for handling pictures, sounds, animations and so on via datatypes. In addition, you can run the Installer on a custom screen with simple background features by using the EFFECT function.

```
CLOSEMEDIA      {44.6}
EFFECT           {44.6}
SETMEDIA        {44.6}
SHOWMEDIA       {44.6}
```

Mathematical stuff

Comparison

```
=
<>
>
>=
<
<=
COMPARE          {NG}
```

Traditional math

```
+
```

```
-
```

```
*
```

```
/
```

Logical operations

```
AND
OR
XOR
NOT
```

Bit testing & manipulation

```
BITAND
BITOR
BITXOR
BITNOT
IN
```

```
SHIFTLEFT  
SHIFTRIGHT
```

Querying the user

In most cases the script needs information from the user, e.g. where to install the package or by asking what to install. This can be realized by these following functions.

```
ASKDIR  
ASKFILE  
ASKSTRING  
ASKNUMBER  
ASKCHOICE  
ASKOPTIONS  
ASKBOOL  
ASKDISK
```

Notifying the user

```
BEEP           {NG}  
COMPLETE  
MESSAGE  
WELCOME  
WORKING
```

Examining the system

In most cases the script needs to know about the system environment. Several functions can be used to find out different system's properties and you should use these functions rather than running external commands.

```
DATABASE       {+}  
FINDBOARD      {NG}  
GETASSIGN  
GETDEVICE  
GETDISKSPACE  
GETENV  
GETSIZE  
GETSUM  
GETVERSION  
QUERYDISPLAY   {44.6}
```

String manipulation

It is often needed to modify, append or extract strings.

```
CAT  
PATMATCH  
STRLEN  
SUBSTR
```

File handling and DOS

Everything you can think of for file manipulation, copying and handling icons and related stuff.

```
COPYFILES  
COPYLIB  
DELETE  
EARLIER
```

```
EXECUTE
EXISTS          {+}
EXPANDPATH
FILEONLY
FOREACH
ICONINFO
MAKEASSIGN
MAKEDIR
PATHONLY
PROTECT
RENAME
REXX
RUN
STARTUP
TACKON
TEXTFILE
TOOLTYPE
```

Debugging and additional execution control

In case of an error, a script could clean up its environment or undo some steps and so on by using some of these functions. Furthermore, this is important and very helpful when programming scripts.

For being more userfriendly, you should use the new functions SWING or TRACE/RETRACE just to give the user a chance to undo/redo his initial settings or something like that.

```
ABORT
DEBUG
NOP          {NG}
ONERROR
EXIT
REBOOT       {NG}
RETRACE      {44.6}
SIMULATE-ERROR {NG}
SWING        {NG}
TRACE        {44.6}
TRANSCRIPT
TRAP
USER
```

Workbench support

Starting with the new AmigaOS 3.5, there is an interface for tools to handle disks, drawers etc as so called "Workbench Objects". For the user these functions work, as the user itself had clicked on a drawer or tool and the AmigaOS will perform the related action automatically. The Installer also supports this interface with these functions:

```
CLOSEWBOBJECT {44.7}
OPENWBOBJECT  {44.7}
SHOWWBOBJECT  {44.7}
```

SOOP support

Only for the InstallerNG. I did this for fun and maybe someone makes use of these features?

```
GET-PROPERTY {NG}
```

PUT-PROPERTY	{NG}
REMOVE-PROPERTY	{NG}

Others

This is the rest of the functions

DELAY	{NG}
LET	{NG}
PROCEDURE	
RANDOM	{NG}
SET	
SETENV	{NG}

Parameter Functions

This set of functions is very special. It does not make sense to use them like the ones above, but you must use these functions as arguments to some other functions. These functions can modify the local environment of different functions like COPYFILES or the query functions.

ALL	
APPEND	
ASSIGNS	
BACK	{44.6}
CHOICES	
COMMAND	
CONFIRM	
DEFAULT	
DELOPTS	
DEST	
DISK	
FILES	
FONTS	
GETDEFAULTTOOL	
GETPOSITION	
GETSTACK	
GETTOOLTYPE	
HELP	
INCLUDE	
INFOS	
NEWNAME	
NEWPATH	
NOGAUGE	
NOPOSITION	
NOREQ	
OPTIONAL	
PATTERN	
PROMPT	
QUIET	
RANGE	
RESIDENT	
SAFE	
SETTOOLTYPE	
SETDEFAULTTOOL	
SETSTACK	
SOURCE	
SWAPCOLORS	

1.20 Advanced features

Defining custom functions

Often it should be useful to define custom functions, which are called as they were part of the Installer. Use the PROCEDURE function for this purpose. The name of custom functions should start with a "P_" just to avoid collisions with future builtin functions. In some cases it is very useful to have local variables for such a function. The old Installer does not provide this feature, but with my InstallerNG you can define so called "let environments" (see the LET function). This environment can be used to create a local environment for a custom function. You must do so, if your functions are recursive, i.e. if they call themselves.

A custom function is defined by its name, a number (even zero) of arguments and the body of the function itself.

```
/* convert a version number to a readable string */
(PROCEDURE P_version-to-string                ; name
  #ver                                         ; argument
  ("%ld.%ld" (/ #ver 65536) (BITAND #ver 65535)) ; body
)

/* count down recursively by using LET */
(PROCEDURE P_recursive                        ; name
  #arg                                         ; argument
  (LET (SET #local #arg)                     ; body
    (
      (IF #local
        (P_recursive (- #local 1))
        (NOP)
      )
    )
  )
)
```

String formatting

Some may know the ANSI-C function `sprintf()`, which takes a template string and a number of arguments and creates a new string by replacing the wildcards in the template string by the related argument. The Installer has this functionality too. If the functional symbol (remember: this is the leftmost one, because this is a prefix language) is of type string (and it does not matter whether it is a string itself or a variable of type string!), then this string gets handled like a format string (a template), and the following expressions are the format parameters. Possible wildcards are (in fact, the Installer uses `exec.RawDoFmt()` so that you can write

every valid template string here):

```
%s   - string
%lc  - character
%ld  - decimal number
%lu  - unsigned decimal number
%lx  - hex number
```

For example, if you write

```
("string '%s' at 0x%lx has %ld chars" "bla" $0000a123 3)
```

you will get the following as result of the evaluation:

```
"string 'bla' at 0xA123 has 3 chars"
```

Note: the Installer does no type checking for the arguments and every argument comes as a long value (32 bit).

Function groups

You can join as many functions as you want into one block: simply put ↵
 parenthesis
 around the functions you want to join. The result of this block is the result ↵
 of
 the last evaluated function. This is often used, if you want more than one
 functions be part of an (e.g.) IF or just to make the code more readable.

```
(IF (= #bla #surz)                ; the condition
  (MESSAGE "#bla equals #surz")   ; "THEN" expression
  (                               ; "ELSE" block
    (BEEP) {NG}
    (MESSAGE "#bla equals #surz")
  )
)
```

1.21 Some theoretical stuff

Here you find some additional information about the InstallerNG. One can find how the Interpreter itself works or some theoretical aspects of the language.

For a big overview about the specification and implementation (german only) please have a look at my homepage (note that this script is obsolete with version 0.3+).

Interpretation

The interpreter does it's job using "call-by-name" strategy. This means it ↵
 first
 evaluates the expression at the first (functional) position of a function, ↵
 which

results into a function call. The called function then evaluates the arguments and uses the results of this as arguments. As you can see this process is recursive.

An example: given the following functions (set i (+ 3 4)) the Installer produces

such a tree:

```

      set
      ^
     i  +
      ^
     3 4

```

Now the interpreter arrives at the top node "set". This means the interpreter calls the internal function "set" and gives as arguments its childs. These childs are an identifier "i" and a sub-tree. Now "set" knows it needs the value of the sub-tree (+ 3 4) so it calls the internal "add" function and this functions gets both, "3" and "4" as arguments. Now "add" evaluates to "7" and gives the result to "set" and now "i" is set to "7".

To give this an other name: interpreting a program means to visit every node of the tree in depth-first-left-to-right-order. Or: go down every (sub)-tree from left to right.

Grammar

The underlying grammar of the language is a context-free LL(1) grammar. Every functional symbol has some attributes (e.g. "Number of args" or "Scope" attributes).

The parser is a top-down one. While parsing the source it calculates some attributes for the nodes of the syntax tree. When done with the tree the optimizer starts to try to optimize the given tree. After this a special function checks whether the given tree is correct or not by comparing and calculating attributes. Don't mix it up with an Attribute Grammar -- this is no one. I just took some ideas from this formalism to make the interpretation more stable.

1.22 Very important notes!!!

There are some very important things you must respect:

Version

The variable @installer-version is set to the current version of the Installer. In this version, this variable contains the same value as the latest release of the C= installer: 44.6! Additional you can check, whether you run on the InstallerNG or not by testing the @installer-ng-version variable: the C= installer returns

a 0 (zero), but the InstallerNG holds its version in this variable.

```
(IF @installer-ng-version
  (
    ; this InstallerNG version
  )

  (
    ; the original amiga installer
  )
)
```

Most public programming faults

Uninitialized variables

Most of the programmers forget to set the variables before use. The original installer accepts this and sets these variables to 0 (zero). The InstallerNG warns you but behaves in the same way. Use the debug output to find uninitialized variables!

Wrong usage of parameter functions

There come some function calls like this:

```
(ASKFILE (IF (= 0 #bla) (PROMPT "Blurp"))
  (IF (= 1 #bla) (PROMPT "Barg"))
  (IF (= 2 #bla) (PROMPT "Tirz"))
  (HELP "Help...")
  (DEFAULT "SYS:"))
)
```

This results in a "Warning: wrong number of arguments", because ASKFILE is missing the PROMPT argument. Note, that this is only a semantic warning, the InstallerNG behaves in the right way! For future scripts use something like this:

```
(ASKFILE (PROMPT (IF (= 0 #bla)
  "Blurp"
  (IF (= 1 #bla)
    "Barg"
    "Tirz"
  )
))
  (HELP "Help...")
  (DEFAULT "SYS:"))
)
```

Weird syntactic/semantic constructs

It is amazing what people code and more funny what the C= Installer

compiles...

```
(IF <condition> <then> <else> <what-the-hell-is-this>)
```

Or something like this:

```
(ASKOPTIONS (CHOICES 1 2 3
                (DEFAULT 1
                  (HELP "little help..."
                    (PROMPT "choose!")
                  )
                )
            )
        )
```

Parameter functions at wrong positions

Some scripts come along with wrong positions for the parameter functions, e. ↵
g.

```
(MAKEDIR (SAFE) (INFOS) "sys:new_dir")
```

This does not work and if you have a look at the original documentation of ↵
the
installer language, you will find the correct expression:

```
(MAKEDIR "sys:new_dir" (SAFE) (INFOS))
```

1.23 All functions in alphabetical order

This is the index for all functions in alphabetical order. Go here for additional explanation of the functions and a grouped overview.

```
=
<>
>
>=
<
<=
+
-
*
/
ABORT
ALL
AND
APPEND
ASKDIR
```

ASKFILE	
ASKSTRING	
ASKNUMBER	
ASKCHOICE	
ASKOPTIONS	
ASKBOOL	
ASKDISK	
ASSIGNS	
BACK	{ 44.6 }
BEEP	{ NG }
BITAND	
BITNOT	
BITOR	
BITXOR	
CAT	
CHOICES	
CLOSEMEDIA	{ 44.6 }
CLOSEWBOBJECT	{ 44.7 }
COMMAND	
COMPARE	{ NG }
COMPLETE	
CONFIRM	
COPYFILES	
COPYLIB	
DATABASE	{ + }
DEBUG	
DEFAULT	
DELAY	{ NG }
DELETE	
DELOPTS	
DEST	
DISK	
GET-PROPERTY	{ NG }
EFFECT	{ 44.6 }
EXECUTE	
EXISTS	{ + }
EXIT	
EXPANDPATH	
EARLIER	
FILEONLY	
FILES	
FINDBOARD	{ NG }
FONTS	
FOREACH	
GETASSIGN	
GETDEFAULTTOOL	
GETDEVICE	
GETDISKSPACE	
GETENV	
GETPOSITION	
GETSIZE	
GETSTACK	
GETSUM	
GETTOOLTYPE	
GETVERSION	
HELP	
ICONINFO	

IF	
IN	
INCLUDE	
INFOS	
LET	{NG}
NEWNAME	
MAKEASSIGN	
MAKEDIR	
MESSAGE	
NEWPATH	
NOGAUGE	
NOP	{NG}
NOPOSITION	
NOREQ	
NOT	
ONERROR	
OPENWBOBJECT	{44.7}
OPTIONAL	
OR	
PATHONLY	
PATMATCH	
PATTERN	
PROCEDURE	
PROMPT	
PROTECT	
PUT-PROPERTY	{NG}
QUIET	
QUERYDISPLAY	{44.6}
RANDOM	{NG}
RANGE	
REBOOT	{NG}
REMOVE-PROPERTY	{NG}
RENAME	
RESIDENT	
RETRACE	{44.6}
REXX	
RUN	
SAFE	
SELECT	
SET	
SETDEFAULTTOOL	
SETENV	{NG}
SETMEDIA	{44.6}
SETSTACK	
SETTOOLTYPE	
SHIFTLEFT	
SHIFTRIGHT	
SHOWMEDIA	{44.6}
SHOWWBOBJECT	{44.7}
SIMULATE-ERROR	{NG}
SOURCE	
STARTUP	
STRLEN	
SUBSTR	
SWAPCOLORS	
SWING	{NG}
TACKON	

```
TEXTFILE
TOOLTYPE
TRACE          {44.6}
TRANSCRIPT
TRAP
UNTIL
USER
WELCOME
WHILE
WORKING
XOR
```

1.24 ABORT

This exits the installation with the given messages and executes the {"ONERROR" link ONERROR} functions (if any)

Template
(ABORT [msg]*)

Parameters
[msg] - strings which will be concatenated and shown right before the InstallerNG starts to execute the ONERROR functions

Options

Result
Type: NUMBER
Returns 0

Note

Example

```
(ABORT "Sorry, I have to quit cause: " #reason)
```

See also
ONERROR

1.25 ADD

Add all the parameters

Template
(+ [value]+)

Parameters
[value] - the value to be added

Options

Result

Type: NUMBER

Returns the sum of all arguments

Note

Example

See also

1.26 AND

The logical "and", i.e. AND delivers true if all its arguments are true. AND stops the evaluation with the first false-argument

Template

(AND [value]+)

Parameters

[value] - the value which should logically be tested

Options

Result

Type: NUMBER


Returns 1 for true and 0 for false

Note

Example

See also

1.27 ASKDIR

Ask the user for a name of a directory. The Installer will show a dir requester  panel which allows an easy selection of the requested directory.

Template

(ASKDIR [option]+)

Parameters

Options

PROMPT

HELP - tell the user what's going to happen

DEFAULT - the default directory; this can be a relative path

NEWPATH - allows to use non-existent paths for DEFAULT

DISK - initially show a list of all drives

ASSIGNS - logical assigns satisfy as well

Result

Type: STRING

Returns the user selected directory

Note

- does return the DEFAULT without a request in "Novice" mode

Example

```
(ASKDIR (PROMPT "select a directory")
        (HELP "...")
        (DEFAULT "C:"))
)
```

See also

1.28 ASKFILE

Ask the user for a file. The Installer will show a file requester panel whichs allows an easy selection of the requested file.

Template

```
(ASKFILE [option]+ )
```

Parameters

Options

PROMPT

HELP - tell the user what's going to happen

DEFAULT - the default file; this can be a relative one

NEWPATH - allows to use non-existent paths for DEFAULT

DISK - initially show a list of all drives

Result

Type: STRING

Returns the user selected file (with expanded path)

Note

- does return the DEFAULT without a request in "Novice" mode

Example

```
(ASKFILE (PROMPT "where can i find your 'delete' command?")
        (HELP "...")
        (DEFAULT "C:Delete"))
)
```

See also

1.29 ASKSTRING

Ask the user for string. The Installer will show a panel where the user can enter the desired text.

Template

```
(ASKSTRING [option]+ )
```

Parameters

Options

PROMPT

HELP - tell the user what's going to happen

DEFAULT - the default string

Result

Type: STRING

Returns the string, typed by the user

Note

- does return the DEFAULT without a request in "Novice" mode

Example

```
(ASKSTRING (PROMPT "gimme your name")
            (HELP "...")
            (DEFAULT "Linda Perry")
)
```

See also

1.30 ASKNUMBER

Ask the user for number. The Installer will show a panel where the user can enter the number. Furthermore, you can specify a range and the user cannot enter numbers outside of this range.

Template

```
(ASKNUMBER [option]+ )
```

Parameters

Options

PROMPT

HELP - tell the user what's going to happen

DEFAULT - the default number

RANGE - lower and upper range (if any) for the requested number

Result

Type: NUMBER

Returns the number

Note

- does return the DEFAULT without a request in "Novice" mode

Example

```
(ASKNUMBER (PROMPT "gimme a small number")
            (HELP "...")
            (DEFAULT 0)
            (RANGE 0 99)
)
```

See also

1.31 ASKCHOICE

Ask the user to select one out of 32 (max) choices. The Installer will show a panel with several mx buttons and the user has to select one of these.

Template

```
(ASKCHOICE [option]+ )
```

Parameters

Options

```
PROMPT
HELP    - tell the user what's going to happen
DEFAULT - the default choice (default is 0)
CHOICES - the list of choices, where the user has to select one
```

Result

```
Type: NUMBER
Returns the number of the selected choice (starting with zero)
```

Note

- does return the DEFAULT without a request in "Novice" mode
- an empty string for a choice means an invisible mx

Example

```
; should return either 0 (male) 1 (female) or 3 (don't know)
(ASKCHOICE (PROMPT "what's your sex?")
            (HELP "...")
            (DEFAULT 1)
            (CHOICES "male" "female" "" "don' know")
)
```

See also

1.32 ASKOPTIONS

Ask the user to select some out of 32 (max) options. The Installer will show a panel with several radio buttons and the user has to select the desired ones.

Template

```
(ASKOPTIONS [option]+ )
```

Parameters

Options

```
PROMPT
HELP    - tell the user what's going to happen
DEFAULT - the default choice (default -1)
CHOICES - the list of choices, where the user has to select one
```

Result

```
Type: NUMBER
Returns a bitmask of selected choices, where a set bit indicates, that
the related choices was selected
```

Note

- does return the DEFAULT without a request in "Novice" mode
- an empty string for a choice means an invisible mx

Example

```
; should return 0 (nothing), 1 (upper), 2 (lower) or 3 (both)
(ASKOPTIONS (PROMPT "what do you like for breakfast")
             (HELP "...")
             (DEFAULT 1)
             (CHOICES "tea" "toast")
)
```

See also

1.33 ASKBOOL

Ask the user to just answer "Yes" or "No" like questions. The Installer shows two mx buttons and the user selects the related button.

Template

```
(ASKBOOL [option]+ )
```

Parameters

Options

```
PROMPT
HELP    - tell the user what's going to happen
DEFAULT - the default choice (default 0)
CHOICES - replace at least one of the both "Yes" and "No" by custom ones
```

Result

```
Type: NUMBER
Returns 1 for "Yes" and 0 for "No"
```

Note

- does return the DEFAULT without a request in "Novice" mode

Example

```
(ASKBOOL (PROMPT "Amiga is really cool")
  (HELP "...")
  (DEFAULT 1)
  (CHOICES "Sure" "Never")
)
```

See also

1.34 ASKDISK

Ask the user to insert a specific disk. As long as this disk is not available, the Installer will wait.

Template

```
(ASKDISK [option]+ )
```

Parameters

Options

```
PROMPT
HELP    - tell the user what's going to happen
DEST    - the requested disk
NEWNAME - a name to assign to the disk when inserted for later reference
DISK    - show drives initially
ASSIGNS - also accept logical devices
```

Result

Type: NUMBER

Returns a bitmask of selected choices, where a set bit indicates, that the related choices was selected

Note

- the volume name must be supplied without a colon! (i.e. you must write "env" instead of "env:")

Example

```
; waits until the user inserts the disk "bla:"
(ASKDISK (PROMPT "insert disk 'BLA:('")
  (HELP "...")
  (DEST "bla")
)
```

See also

1.35 BEEP

{NG} Simply flashes the screen and beeps.

Template
(BEEP)

Parameters

Options

Result
Type: NUMBER
Returns 0

Note
This respects your prefs-settings when beeping.

Example
(BEEP)

See also

1.36 BITAND

Does a bitwise AND with the arguments

Template
(BITAND [value]{2})

Parameters
[value] - the arguments for the bitwise logical AND

Options

Result
Type: NUMBER
Returns the result of the bitwise AND

Note

Example

See also

1.37 BITOR

Does a bitwise OR with the arguments

Template
(BITOR [value]{2})

Parameters

[value] - the arguments for the bitwise logical OR

Options

Result

Type: NUMBER

Returns the result of the bitwise OR

Note

Example

See also

1.38 BITXOR

Does a bitwise OR with the arguments

Template

(BITXOR [value]{2})

Parameters

[value] - the arguments for the bitwise logical XOR

Options

Result

Type: NUMBER

Returns the result of the bitwise XOR

Note

Example

See also

1.39 BITNOT

Does a bitwise NOT with the argument

Template

(BITAND [value])

Parameters

[value] - the value to be bitwise negated

Options

Result

Type: NUMBER

Returns the result of the bitwise NOT

Note

Example

See also

1.40 CAT

Concatenate several strings.

Template
(CAT [string]+)

Parameters
[string] - the strings to be concatenated

Options

Result
Type: STRING
Returns the concatenation of all argument strings

Note
- CAT converts its number arguments into strings, such that you may use CAT for getting a string out of an number

Example

```
(SET #longstring (CAT "this is a long string with numbers..." 4 5 "82" "!!!"))
```

See also

1.41 CLOSEMEDIA

Closes an arbitrary media object, which must have been opened using SHOWMEDIA

Template
(CLOSEMEDIA [mediaobject])

Parameters
[mediaobject] - the object to be closed

Options

Result
Type: NUMBER
Returns 0

Note

see SHOWMEDIA

Example

see SHOWMEDIA

See also

SETMEDIA, SHOWMEDIA

1.42 CLOSEWBOBJECT

Closes an arbitrary workbench object, which currently only can be a disk or a drawer or a trashcan

Template

```
(CLOSEWBOBJECT [wbobject] )
```

Parameters

[wbobject] - the object to be closed

Options

Result

Type: NUMBER

Returns 1, if CLOSEWBOBJECT could perform this closing action, 0 if not or -1, if the machine (i.e. the Workbench) does not support this function.

Note

Example

see OPENWBOBJECT

See also

see SHOWWBOBJECT, OPENWBOBJECT

1.43 COMPARE

{NG}

This function compares two values of any, but the same type and returns the result of this comparison.

Template

```
(COMPARE [expr1] [expr2] )
```

Parameters

[expr1] - first value

[expr2] - value, which has to be compared with the first value

Options

Result

Type: NUMBER

```
Returns  1 - [expr1] greater than [expr2]
          0 - [expr1] equals [expr2]
         -1 - [expr1] is smaller than [expr2]
```

Note

- both arguments must be of the same type. The Installer tries to convert a string into a number if the types are not equal

Example

```
(COMPARE 2 2)           -> 0
(COMPARE 2 "2")          -> 0
(COMPARE "bla" "nana")   -> -1
```

See also

1.44 COMPLETE

Inform the user about the completion of an installation process. This message will be printed in the title bar of the installer window.

Template

```
(COMPLETE [done])
```

Parameters

[done] - a number between 0 and 100 which means the amount of work, which is already done

Options

Result

Type: NUMBER

Returns the argument [done]

Note

Example

```
(COMPLETE 75) ; print, that 75% of the installation is done
```

See also

1.45 COPYFILES

Copy a number of files from a source to a destination. The Installer shows the files and the user may select/deselect, which files of the predefined files should be copied.

Template

```
(COPYFILES [option]+ )
```

Parameters

Options

```
PROMPT
HELP      - tell the user what's going to happen
SOURCE    - the name of the source file or directory (may be relative)
DEST      - name of the destination file or directory (may be relative)
           Note: the destination directory will be created, if it does
           not exist
NEWNAME    - if copying one file only, and file is to be renamed, this is the
           new name.
CHOICES    - a list of files/directories to be copied (optional)
ALL        - all files/directories in the source directory should be copied.
PATTERN    - indicates that files/directories from the source dir matching ←
           this
           pattern should be copied
FILE       - Only copy files; by default the Installer will match and copy
           subdirectories
INFOS      - switch to copy icons along with other files/directories.
NOPOSITION - reset the position of every icon copied.
FONTS      - switch to not display ".font" files, yet still copy any that ←
           match
           a directory that is being copied
NOGAUGE     - don't display the status indicator
OPTIONAL    - dictates what will be considered a failure on copying; the first
           three options are mutually exclusive (they may not be specified
           together)

           FAIL: Installer aborts if could not copy (the default).
           NOFAIL: Installer continues if could not copy.
           OKNODELETE: aborts if can't copy, unless reason was "delete ←
           protected".
           FORCE: unprotect destination
           ASKUSER: ask user if the file should be unprotected (but not in
           novice) In the case of 'askuser', the default for novice mode
           is an answer of "no". Therefore, you may want to use 'force'
           to make the novice mode default answer appear to be "yes".
DELOPTS     - removes options set by "optional"
CONFIRM     - if this option is present, user will be prompted to indicate ←
           which
           files are to be copied, else the files will be copied silently.
SAFE        - copy files even if in PRETEND mode.
```

Result

```
Type: NUMBER
Return 0
```

Note

- the options ALL/CHOISES/PATTERN are mutually exclusive
- PATTERN only accepts standard AmigaOS patterns

Example

```
; just copy files beginning with "C" or "F" to t:
(COPYFILES (SOURCE "c:"))
```



```

        (DEST "T:")
        (PATTERN "(C#?|F#?)" )
    )

```

1.46 COPYLIB

Copies only one file using version checking, i.e. it only overwrites the destination file (if it exists) if the new file has a version/revision higher than the existing file. If the destination directory does not exist, it will be created.

Template

```
(COPYLIB [option]+ )
```

Parameters

Options

```

PROMPT
HELP      - tell the user what's going to happen
CONFIRM   - if this option is present, user will be prompted to confirm the
            copy operation, else the files will be copied silently. Note that
            an EXPERT user will be able to overwrite a newer file with an
            older one.

SOURCE     - the name of the source file(may be relative)
DEST       - name of the destination directory (may be relative)
NEWNAME    - if the file is to be renamed, this is the new name
INFOS      - switch to copy icons along with other files/directories.
NOPOSITION - reset the position of every icon copied.
NOGAUGE    - don't display the status indicator
OPTIONAL   - dictates what will be considered a failure on copying; the first
            three options are mutually exclusive (they may not be specified
            together)
            FAIL: Installer aborts if could not copy (the default).
            NOFAIL: Installer continues if could not copy.
            OKNODELETE: aborts if can't copy, unless reason was "delete ←
                        protected".
            FORCE: unprotect destination
            ASKUSER: ask user if the file should be unprotected (but not in
                    novice) In the case of 'askuser', the default for novice mode
                    is an answer of "no". Therefore, you may want to use 'force'
                    to make the novice mode default answer appear to be "yes".

DELOPTS    - removes options set by "optional"
SAFE       - copy the file even if in PRETEND mode.

```

Result

Note

- the destination directory will be created, if it does not exist

Example

```

(COPYLIB (SOURCE "libs/mylib.library_020")
        (DEST "libs:")
        (NEWNAME "mylib.library")

```

)

1.47 DATABASE

Returns information about the AMIGA that the InstallerNG is running on. The second argument [checkvalue] is meant to be optional. If you do not use this argument, DATABASE always returns a string with the result (see below for valid results). When using the [checkvalue], then InstallerNG returns a number which is either 0 or 1.

Template

```
(DATABASE [feature] [checkvalue]{0-1} )
```

Parameters

[feature]	This string argument describes the information you are looking for. Valid features are:
"CPU"	- which type of CPU ("68000", "68010", "68020", "68030", "68040", "68060")
"PPC" {NG}	- checks for PPC; returns "PPC" if there is a PPC installed, "" otherwise
"FPU"	- which type of FPU ("68881", "68882", "FPU040", "FPU060")
"MMU" {NG}	- which type of MMU ("68851", "MMU040", "MMU060")
"OS-VER" {NG}	- the version of exec (e.g. "40")
"GRAPHICS-MEM"	- amount of free chip memory
"FAST-MEM" {NG}	- amount of free fast memory
"TOTAL-MEM"	- total free memory
"CHIPREV"	- the revision of the graphic chipset ("AA", "ECS", "AGNUS")
"GFXSYSTEM" {NG}	- the installed graphics system ("CyberGraphics", "Picasso96")
"DATE" {NG}	- the current date of your computer
"TIME" {NG}	- the current time of your computer
"GUI" {NG}	- type of the used GUI

[checkvalue] optional; when given, this has to be a string. After evaluating the [feature], the result-string is compared to [checkvalue]. If this comparison matches, then DATABASE returns the number 1, otherwise the number 0

Options

Result

the only parameter is [feature]
a string containing the requested information or "unknown" if [feature] is an illegal string

both parameters [feature] and [checkvalue] specified
 a number; 1 if [checkvalue] matches the result of [feature], otherwise 0

Note

- InstallerNG accepts patterns for the [checkvalue] string, which will not work with the C= installer ↵

Example

```
(DATABASE "cpu")                ; e.g. "68060"
(DATABASE "bla")                ; "unknown"
(DATABASE "cpu" "68000")        ; 1 iff you run on a 68000, otherwise 0

; this worx on every installer!!!
(IF @installer-ng-version
  (
    (DATABASE "cpu" "(68040|68060)")
  )
  (
    (PATMATCH "(68040|68060)" (DATABASE "cpu"))
  )
)                                ; 1 iff you run on a 68040 or 68060, ↵
otherwise 0
```

See also

1.48 DEBUG

Print anything to the InstallerNG-DEBUG console. You can supress this output with switching off the "Show debug" option or by not setting the DEBUGMODE shell-argument/tooltype.

Template

```
(DEBUG [debuginfo]+ )
```

Parameters

[debuginfo] - this can be anything: a number, a string, an expression.
 DEBUG prints the evaluation-result of [debuginfo] to the console window, followed by a linefeed.

Options

Result

Type: STRING

The result of the last [debuginfo] - evaluation

Note

- if [debuginfo] is an uninitialized variable, then DEBUG prints an "<NIL>" to warn the user

Example

```
(SET a 0)
(DEBUG 1 "does not equal" a b)
```

See also

1.49 DELAY

{NG}

Sometimes it is useful to wait a specific time. Use the DELAY function for this purpose.

Template

```
(DELAY [ticks])
```

Parameters

[ticks] - a number whichs defines the ticks. A tick is 1/50 second.

Options

Result

Type: NUMBER

Returns the [ticks]

Note

Example

```
(DELAY 50) ; wait a second
```

See also

1.50 DELETE

Delete a specific file

Template

```
(DELETE [file] [options]* )
```

Parameters

[file] - the path and name of the file, which has to be deleted (may be ↵
relative)

Options

PROMPT

HELP - tell the user what's going to happen.

CONFIRM - if this option is present, the user will be asked for confirmation ↵

,

otherwise the delete proceeds silently

OPTIONAL - should deletions be forced. options:

FORCE: unprotect destination

```

        ASKUSER: ask user if the file should be unprotected (but not in
                    novice
                    mode) In the case of ASKUSER, the default for "Novice" mode is
                    an
                    answer of "No". Therefore, you may want to use FORCE to make
                    the novice mode default answer appear to be "Yes"
DELOPTS  - removes options set by OPTIONAL
SAFE     - delete even if in "Pretend" mode
INFOS    - also delete corresponding info file. Do not use this option
          together with ALL
ALL       - check all matching subdirectories, too

```

Result

```

Type: NUMBER
Returns 0

```

Note

```

- you are allowed to specify an AmigaOS pattern for the [file] parameter and
  by setting the ALL option, DELETE will delete all matching entries

```

Example

```

; deletes all libraries from LIBS:, which are named bla....library
(DELETE "libs:bla#?.library"
  (SAFE)
  (ALL)
)

```

See also

1.51 DIV

Divide a number by an other one

Template

```

(/ [value1] [value2])

```

Parameters

```

[value1]
[value2] - both values

```

Options

Result

```

Type: NUMVER
Returns the result of value1/value2

```

Note

Example

1.52 EARLIER

Check, whether a file is "younger" than another file

Template

```
(EARLIER [file1] [file2])
```

Parameters

```
[file1]  
[file2] - the files
```

Options

Result

Type: NUMBER

Returns 1 if [file1] is earlier than [file2]; 0 otherwise

Note

Example

1.53 EFFECT

If the script contains an EFFECT function, then this function will be executed before any other function. EFFECT opens a new screen (with same properties as the "Workbench") and forces the Installer to work on that new screen. Additionally, you can define simple grafix effects on this screen

Template

```
(EFFECT [position] [effect] [color1] [color2])
```

Parameters

```
[position] - moves the Installer window to a special position; valid  
            strings are - "upper_left"  
                        - "upper_center"  
                        - "upper_right"  
                        - "center_left"  
                        - "center"  
                        - "center_right"  
                        - "lower_left"  
                        - "lower_center"  
                        - "lower_right"  
[effect]    - specify the effect for the screens background; valid  
            strings are - "horizontal" (fades with horizontal lines)  
                        - "radial" (fade with circles)  
[color1]  
[color2]    - set the fading colors; both are NUMBERS and specify the  
            24 bit RGB value
```

Options

Result

Note

- using an own screen makes it impossible to use InstallerNG's drag-n-drop features
- the effect "radial" only works on true-color screens and falls back to "horizontal" on non-true-color screens

Example

```
; fade from black to white
(EFFECT "center" "horizontal" $00000000 $00ffffff)
```

See also

1.54 EQU

Checks, whether an expression equals an other expression

Template

```
(= [value1] [value2])
```

Parameters

```
[value1]
[value2] - the values to be compared
```

Options

Result

```
Type: NUMBER
Returns 1 if both values are equal, 0 otherwise
```

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

```
see COMPARE
```

See also

1.55 EXECUTE

Execute an AmigaDOS script with the given arguments

Template

```
(EXECUTE [script] [args]* [option]* )
```

Parameters

```
[script] - the script, which has to be executed
[args]   - the arguments for the script
```

Options

PROMPT
HELP - tell the user what's going to happen
CONFIRM - ask the user for confirmation
SAFE - execute even in "Pretend" mode

Result

Type: NUMBER
Returns the return value of the script

Note

- the secondary result will be stored in the variable @ioerr

Example

1.56 EXIT

Causes a normal termination of a script. The ONERROR functions are not evaluated.

Template

(EXIT [message]* [option])

Parameters

[message] - these strings are concatenated and displayed as the final report

Options

QUIET - skip the final message

Result

Type: NUMBER
Returns 0

Note

Example

1.57 EXISTS

Checks if a given path is valid or not. The result is a number, which describes the type of the path.

Template

(EXISTS [path] [option]*)

Parameters

[path] - this string is the object, which has to be examined, e.g. "s:blurp"

Options

NOREQ - when specified, then no requester will pop up, if [path] is not on an mounted volume

Result {NG}

Type: NUMBER

Returns 0 - [path] does not exist
 1 - [path] is a file
 2 - [path] is a directory
 3 - [path] is a link to a file
 4 - [path] is a link to a directory

Note

The old Installer just returns either 0 or not 0

Example

```
(EXISTS "s:startup-sequence")      ; should be 1
(EXISTS "C:")                      ; should be 2
(EXISTS "grfm:hlbzs/hsjs")         ; maybe 0
```

See also

1.58 EXPANDPATH

Get the full path of a file or a logical assign

Template

```
(EXPANDPATH [path])
```

Parameters

[path] - the path which should be expanded

Options

Result

Type: STRING

Returns the full path of [path]

Note

Example

```
(EXPANDPATH "c:") ; may deliver "System:C" or whatever
```

See also

1.59 FILEONLY

Returns the file part (i.e. the last path component) of a given path

Template

```
(FILEPART [path])
```

Parameters

[path] - the path

Options

Result

Type: STRING

Returns the file part of the [path]

Note

Example

See also

PATHONLY

1.60 FINDBOARD

{NG}

This functions makes you able to find a specific hardware expansion board in the system.

Template

(FINDBOARD [manufacturer] [product])

Parameters

[manufacturer] - the manufacturer id of the board. this id is unique for every (registered!) hardware producer and is assigned by C=
[product] - the number of the product of a specific manufacturer.

Options

Result

Type: NUMBER

Returns the number of found boards

Note

To get a list of valid manufacturers and their products, please have a look at the "board.library" package or related tools like "ShowBoardsMUI" by Torsten Bach

Example

```
(SET #boardcount (FINDBOARD 8512 67)) ; how many CV64/3D gfx-cards has the ↵  
system?
```

See also

1.61 FOREACH

For each file of a directory, which matches a given pattern, a sequence of functions will be executed. The variables @each-name and @each-type will hold the name and the AmigaDOS object type (file/directory) for each of the matching files.

Template

```
(FOREACH [dir] [pattern] [fun]+)
```

Parameters

[dir] - the directory which will be used for the walk
 [pattern] - an AmigaDOS pattern, which specifies the files, for which some functions will be executed
 [fun] - functions for matching files; these functions should make use of the variables @each-name and @each-type

Options

Result

Type: NUMBER
 Return 0

Note

- @each-type is less than zero for files; greater than zero for directories

Example

```
; recursively print a directory tree of a given dir
(PROCEDURE P_PrintDirTree #d
  (LET (SET #dir #d)
    (FOREACH #dir "#?"
      (
        (DEBUG @each-name)
        (IF (> @each-type 0) (P_PrintDirTree (tackon #dir ←
          @each-name)))
      )
    )
  )
)
```

See also

1.62 GE

Checks, whether an expression is greater or equal to an other expression

Template

```
(>= [value1] [value2])
```

Parameters

[value1]
 [value2] - the values to be compared

Options

Result

Type: NUMBER

Returns 1 if [value1] is greater or equal than [value2], 0 otherwise

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

see COMPARE

See also

1.63 GETASSIGN

Returns the pathname of an AmigaDOS object.

Template

```
(GETASSIGN [name] [spec]{0-1} )
```

Parameters

- [name] - the name of the object, for which the path should be found
- [spec] - specifies, in which list the installer should search; valid strings are:
- "a" for the list of assigns (default)
 - "v" for the volume list
 - "d" for the device list

Note that you are allowed to specify several lists by appending the specification characters (i.e. if you want to search all three list, simply write "adv")

Options

Result

Type: STRING

Returns the pathname or an empty string, if the pathname could not be found

Note

- without setting a [spec], only the assign list will be checked
- [name] must be specified without colons; i.e. instead of "ENV:" you must write "ENV"

Example

See also

1.64 GETDEVICE

Returns the name of the device, on which a given path resides

Template

```
(GETDEVICE [path])
```

Parameters

[path] - the path, for which the device name should be found

Options

Result

Type: STRING

Returns the device name

Note

- the device name comes without colons

Example

```
; find out, on which device the mountlist resides  
(GETDEVICE "devs:mountlist") ; may return "System"
```

See also

1.65 GETDISKSPACE

Returns the available free disk space in bytes on the disk given by a path.

New for v44+

Additionally, you may specify the unit for the calculated space. Typical hard drives are larger than 4 G today and partitions may also be larger than 2 G. Older versions of Installer returns illegal values for partitions larger than 2 GB. The new installer returns the maximum integer (2147483647) if the partition is too large.

Template

```
(GETDISKSPACE [path] [unit]{0-1} )
```

Parameters

[path] - the path, which specifies device

[unit] - optional and defines the unit for the returned disk space:
"B" (or omitted) is "Bytes", "K" is "Kilobytes", "M" is "Megabytes"
and "G" is "Gigabytes"

Options

Result

Type: NUMBER

Returns the free disk space or -1, if [path] was illegal

Note

- you should use at least unit "K" in new installer scripts to avoid overflows with large harddrives.

Example

See also

1.66 GETENV

Returns the content of a environment variable, which is usually located in the "ENV:" drawer

Template

```
(GETENV [varname])
```

Parameters

[varname] - the name of the variable

Options

Result

Type: STRING

Returns the content of the variable

Note

- currently, the content is limited to 64 bytes, which should be enough in most cases
- binary data are not supported

Example

See also

1.67 GET-PROPERTY

{NG}

Read a specific property of a symbol.

Template

```
(GET-PROPERTY <symbol> <property>)
```

Parameters

<symbol> - the target symbol

<property> - the desired property of the symbol

Options

Result

Type: depends on the property's type

Returns the value of the property

Note

Example

```
(SET #bla "savage is cool :-)") ; declare a symbol #bla
(PUT-PROPERTY #bla "property" 20) ; add property "property" to the symbol # bla
```

```
(MESSAGE                                ; get the value of #bla's property " ←  
    property"  
    (GET-PROPERTY #bla "property")  
    )  
(REMOVE-PROPERTY #bla "property")      ; remove "property" from #bla
```

See also

```
PUT-PROPERTY  
REMOVE-PROPERTY
```

1.68 GETSIZE

Returns the size of a file in bytes

Template

```
(GETSIZE [filename])
```

Parameters

[filename] - the path and name of the file

Options

Result

Type: NUMBER

Returns the size of the file

Note

Example

See also

1.69 GETSUM

Calculate a checksum for a file. This could be used for checking version or if the content of files differs

Template

```
(GETSUM [filename])
```

Parameters

[filename] - the name of the file, for which you wanna calc the checksum

Options

Result

Result: NUMBER

Returns the checksum for a file

Note

- use the "GetSum" shell command (provided with the InstallerNG package) to calculate checksums for files from a shell

Example

See also

1.70 GETVERSION

This returns the version of a file. The file must have a valid RomTag structure or a valid AmigaDOS 2.x version string. If you do not provide the filename, this simply returns the version of the OS.

Template

```
(GETVERSION [name]{0-1} [option]* )
```

Parameters

[name] - the file, for which you need the version

Options

RESIDENT - specifying this, causes the Installer to search the systems library and device lists for the [name] entry

Result

Type: NUMBER

Returns the version of the file or OS; returns 0 if [name] was invalid

Note

The result is a 32 bit value; the upper 16 bits contain the version and the lower 16 bits the revision.

Example

```
(GETVERSION) ; returns the version of the OS
(GETVERSION "c:dir") ; returns DIR's version
(GETVERSION "dos.library" (RESIDENT)) ; returns the version of the dos.library

; this function converts a version number to a readable string
(PROCEDURE version-to-string #ver ("%ld.%ld" (/ #ver 65536) (BITAND #ver <-
65535)))
(MESSAGE "OS version of your Amiga: " (version-to-string (GETVERSION)) " !!!")
```

See also

1.71 GT

Checks, whether an expression is greater than an other expression

Template

```
(> [value1] [value2])
```

Parameters

[value1]

[value2] - the values to be compared

Options

Result

Type: NUMBER

Returns 1 if [value1] is greater than [value2], 0 otherwise

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

see COMPARE

See also

1.72 ICONINFO

Obtain information about an icon's tool type and more. Except for the result, this function differs from other functions. The arguments for most parameters are not values but names of symbols that will be set to those values by the function. Be careful!

Template

(ICONINFO [option]+)

Parameters

Options

PROMPT

HELP

- tell the user what's going to happen.

DEST

- the name of the icon to be modified. There is no need to ↩

specify a

".info" extension.

CONFIRM

- if this option is present, the user will be asked for ↩

confirmation,

otherwise the modification proceeds silently.

SAFE

- make changes even if in "Pretend" mode

GETTOOLTYPE

- the tooltype name and result symbol name string.

GETDEFAULTTOOL

- symbol name for the default tool name of a project.

GETSTACK

- symbol name for the current stack size of the icon.

GETPOSITION

- Two symbol names for the saved icon position in X and Y ↩

direction.

Do not use this lightly. It is intended to keep icon positions on updates with help of the parameter SETPOSITION of the TOOLTYPE function. Arbitrarily changing icon positions will lead to annoyed users due to different Workbench and ↩ font

setups. If the icon doesn't have a position set, -1 is ↩ returned

for the respective position value. This may be passed to TOOLTYPE

Result
Type: NUMBER
Returns 0

Note

Example

```
; show the initial size of the stack of the InstallerNG
(ICONINFO (DEST "C:InstallerNG")
           (GETSTACK "stack")
)
(MESSAGE stack)
```

See also

1.73 IF

Conditionally execute functions. If [condition] is TRUE (i.e. not 0) then the [then] will be executed, otherwise [else]

Template
(IF [condition] [then] [else])

Parameters
[condition] - any expression
[then] - functions which are executed if [condition] is TRUE
[else] - functions which are executed if [condition] is FALSE

Options

Result
Type: depends
Returns the result of [then] or [else]

Note

Example

```
(IF (= 2 4) ; condition
    (MESSAGE "TRUE") ; then
    ( ; else
      (MESSAGE "FALSE")
      (BEEP)
    )
)
```

See also

1.74 IN

Returns 0 if none of the given bit numbers (starting at 0 for the LSB) is set in the value, else returns a mask of the bits that were set.

Template

(IN [value] [bitnum]+)

Parameters

[value] - the value to be checked
[bitnum] - the numbers of bits, which are checked, whether they are set in [value] or not

Options

Result

Type: NUMBER

Returns 0 or a mask

Note

Example

See also

1.75 LE

Checks, whether an expression is less or equal to an other expression

Template

(<= [value1] [value2])

Parameters

[value1]
[value2] - the values to be compared

Options

Result

Type: NUMBER

Returns 1 if [value1] is less or equal than [value2], 0 otherwise

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

see COMPARE

See also

1.76 LET

```
{NG}
This function creates a new environment. This means, you can declare new ↵
variables
within the <init> functions and use them in the <body> functions. If you define
local variables, which have the same name like existing ones, you "replace" the ↵
existing
by the local variables. Nevertheless you can access existing variables, which ↵
are
not overwritten.
Imagine of the new environment as a layer, which overwrites variables with the ↵
same name
but keeps all other variables.
Put this function as the first into a PROCEDURE definition and write the body of ↵
the
PROCEDURE as the body of the LET function! Now you have private variables for ↵
the
procedure :)
```

Template

```
(LET <init> <body> )
```

Parameters

```
<init> - one function, which initializes the local environment. It does not ↵
make
sense to use other functions than SET here
<body> - the body of a LET function are the functions, which use this local
environment
```

Options

Result

```
LET returns the result of the last function of <body>
```

Note

```
Since LET is a simple function, you can create LET environments inside of LET
environments inside of...
```

Example

```
; this "creates" the value 7 by adding values of the local environment
(LET (SET x 3 y 4)
    (+ x y)
)

; a procedure with local variables
(PROCEDURE P_bla #arg1 #arg2
  (LET (SET #local_x #arg1
           #local_y #arg2
        )
    (
      ; do anything with #local_x and #local_y
    )
  )
)
```

1.77 LT

Checks, whether an expression is less than an other expression

Template

```
(< [value1] [value2])
```

Parameters

[value1]

[value2] - the values to be compared

Options

Result

Type: NUMBER

Returns 1 if [value1] is less than [value2], 0 otherwise

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

see COMPARE

See also

1.78 MAKEASSIGN

Assigns an assign to a path or removes a specific assign.

Template

```
(MAKEASSIGN [assign] [path]{0-1} [option]* )
```

Parameters

[assign] - the name for the assign

[path] - optional; the path, which should be assigned to [assign]

Options

SAFE - if specified, the assign will be created even in "Pretend" mode

Result

Type: NUMBER

Returns 0

Note

- omit [path] to clear the assign

Example

See also

1.79 MAKEDIR

Just create a new directory. Furthermore you are allowed to specify a complete path and the Installer will create all the necessary sub-directories

Template

```
(MAKEDIR [name] [option]* )
```

Parameters

[name] - the name or path of the directory

Options

PROMPT
HELP - tell the user what's going to happen
CONFIRM - ask for confirmation; otherwise the directory will be created silently
INFOS - also create an icon for the drawer
SAFE - make the directory even in "Pretend" mode

Result

Type: NUMBER

Returns 0

Note

Example

See also

1.80 MESSAGE

~Display some text to the user

Template

```
(MESSAGE [string]* [option]* )
```

Parameters

[string] - the strings, which, all concatenated into one single string, gets displayed

Options

ALL - Show the text also to "Novice" users

Result

Type: STRING

Returns the displayed text

Note

- in "Novice" mode, the text will not be shown as long as you do not specify the ALL option

Example

See also

1.81 MUL

Multiply some values

Template

```
(* [value]* )
```

Parameters

[value] - all the values, from which the result will be calculated

Options

Result

Type: NUMBER

Returns the product of the multiplication

Note

Example

See also

1.82 NE

Checks, whether an expression is equals an other expression

Template

```
(<> [value1] [value2])
```

Parameters

[value1]

[value2] - the values to be compared

Options

Result

Type: NUMBER

Returns 1 if [value1] does not equal [value2], 0 otherwise

Note

- see COMPARE
- causes a "type conflict" error, if both types are not equal and when they were not convertible

Example

see COMPARE

See also

1.83 NOP

{NG}

Does nothing...

Since my language definition does not allow empty function-lists,
I thought it would be useful to have a NOP function for this case :)

Template

(NOP)

Parameters

Options

Result

Type: NUMBER

Returns 0

Note

Example

```
; if @bla equals 5, then do nothing, else beep and pop a message
(IF (= @bla 5)
  (NOP) {NG}
  (
    (BEEP) {NG}
    (MESSAGE "@bla does not equal 5")
  )
)
```

See also

1.84 NOT

Negates the boolean value of an expression

Template

(NOT [value])

Parameters

[value] - the value to be negated

Options

Result

Type: NUMBER

Returns the boolean "Not" of the value

Note

Example

See also

1.85 ONERROR

When a fatal error occurs that was not trapped, a set of statements can be called to clean-up after the script. These statements are logged in by using the onerror construct. Note that onerror can be used multiple times to allow context sensitive termination.

Template

```
(ONERROR [fun]* )
```

Parameters

[fun] - some functions, which will be executed in case of not trapped errors

Options

Result

Type: NUMBER

Returns 0

Note

Example

```
; execute this in case of an error
(ONERROR (BEEP) {NG}
          (DEBUG "bad error!!!")
          (EXIT (QUIET)))
)
```

See also

TRAP

1.86 OR

The logical "or", i.e. OR delivers true if at least one of its arguments is true. ↵

OR stops the evaluation with the first true-argument

Template

```
(OR [value]+ )
```

Parameters

[value] - the value which should logically be tested

Options

Result

Type: NUMBER

See also

see SHOWWBOBJECT, OPENWBOBJECT

1.88 PATHONLY

Returns the non-file part of a given path by extracting the last component (the file part) from the path

Template

(PATHONLY [path])

Parameters

[path] - the path, from which you need the path part

Options

Result

Type: STRInG

Returns the path part of [path]

Note

Example

See also

FILEONLY

1.89 PATMATCH

Determines, if a given string matches an AmigaDOS pattern or not. The pattern has to fulfill the conventions for patterns of the AmigaDOS!

Template

(PATMATCH [pattern] [string])

Parameters

[pattern] - an AmigaDOS pattern

[string] - the string, which gets matched against the [pattern]

Options

Result

Type: NUMBER

Returns 1 if the string matches the pattern, 0 otherwise

Note

Example

See also

1.90 PROCEDURE

Using this function, you can define your own functions.

Template

```
(PROCEDURE [name] [params]* [fun]+ )
```

Parameters

```
[name] - an identifier, which defines the name of the procedure
[params] - a list of parameters for the function
[fun] - the body of the function
```

Options

Result

```
(internally, this does not execute like other functions and, thus,
has not return value/type)
```

Note

- for future compatibility, please name your functions starting with "P_" as prefix, so that collisions with new functions will be avoided
- PROCEDURE should be named "DEF-FUNCTION" or something similar, but for compatibility I kept the name for the InstallerNG

Example

```
see GETVERSION or FOREACH for sample functions
```

See also

1.91 PROTECT

Either get or set the protection values of a given file or directory. You can define the protection mask by a string or by a number mask.

Template

```
(PROTECT [file] [mask]{0-1} [option])
```

Parameters

```
[file] - the file for this operation
[mask] - optional; either a string or a decimal number, which specifies the
mask of bits for the file. The bits and the related characters
are defined as follows
```

```
8 7 6 5 4 3 2 1  <- bit number
```

```
h s p a r w e d  <- corresponding protection flag
```

```
^ ^ ^ ^ ^ ^ ^ ^
| | | | | | | |
| | | | | | | +- \
| | | | | | +---- | 0 = flag set
| | | | | +----- | 1 = flag clear
| | | | +----- /
```

```

| | | |
| | | |
| | | +----- \
| | +----- | 0 = flag clear
| +----- | 1 = flag set
+----- /

```

Options

SAFE - change protection even in "Pretend" mode

Result

Type: NUMBER

Returns 0 (for failure) or 1 (for success) if you changed the protection bits of a file or, if you want to read a protection (in this case, omit the [mask] argument), returns the mask of protection bits of the given file

Note

- this follows the AmigaOS rules for protection bits
- you must not use the "H" bit since this is currently not supported by the AmigaOS

Example

See also

1.92 PUT-PROPERTY

{NG}

Bind a property to a symbol. Imagine of a "property" as an attribut, i.e. a property-name and a related value. If the property already exists, its value just gets updated.

Template

```
(PUT-PROPERTY <symbol> <property> <value>)
```

Parameters

- <symbol> - the target symbol
- <property> - the property you wish to create or modify
- <value> - the (new) value of the property

Options

Result

Type: depends on the type of <value>

Returns <value>

Note

If the <property> for the <symbol> already exists, the value of the property will be changed to <value>

Example

see GET-PROPERTY

See also

GET-PROPERTY
REMOVE-PROPERTY

1.93 QUERYDISPLAY

~Returns information about the current display of the Installer window

Template

```
(QUERYDISPLAY [object] [attribute])
```

Parameters

[object] - the target object, must be "screen" or "window"
[attribute] - the attribute of the object, which has to be examined;
valid attributes are for
windows: "width", "height", "upper", "lower" "left" "right"
screens: "width", "height", "depth", "colors"

Options

Result

Type: NUMBER
Returns the value of the attribute

Note

Example

See also

1.94 RANDOM

{NG}

This results in a random number, which ranges in given bounds

Template

```
(RANDOM <lower> <upper>)
```

Parameters

<lower>
<upper> - the numbers which specify the range, where the result ranges in

Options

Result

Type: NUMBER
Returns a random number from <lower> ... <upper>

Note

Example

```
(RANDOM 20 50) ; give a number between 20 and 50
```

See also

1.95 REBOOT

{NG}

This function causes a reboot of your Amiga. Several scripts may need this to mount new drivers to the system. Be careful with this ;)

Template

```
(REBOOT <options>)
```

Parameters

Options

(SAFE) - specifying this will cause a reboot even in pretend mode

Result :)

Type: NUMBER

Returns 0

Note

Example

```
(REBOOT)           ; reboots, but not in pretend mode
(REBOOT (SAFE))    ; always reboot
```

See also

1.96 REMOVE-PROPERTY

{NG}

Remove a specific property from a symbol. This does really remove the property itself, not only a reset of the property!

Template

```
(REMOVE-PROPERTY <symbol> <property>)
```

Parameters

<symbol> - the target symbol

<property> - the property you wish to remove

Options

Result

Type: NUMBER

Returns 0

Note

Example

see GET-PROPERTY

See also
GET-PROPERTY
PUT-PROPERTY

1.97 RENAME

Rename a file/directory or a disk.

Template
(RENAME [oldname] [newname] [option*])

Parameters
[oldname] - the source file/directory or the disk to be renamed; in case of an disk, the name must contain a colon (e.g. "DF0:")
[newname] - new name; in case of a disk, the new name must NOT contain the colon

Options
PROMPT
HELP - tell the user what's going to happen
CONFIRM - if this is present, then the user will be asked for confirmation
DISK - you must specify this, if you want to rename a disk (called "relabeling")
SAFE - rename even in "Pretend" mode

Result
Type: NUMBER
Returns 0

Note

Example

See also

1.98 RETRACE

This will skip the last evaluated TRACE and does continue to work at the previous one. A tracepoint gets lost if the evaluation leaves the scope of the TRACE.

Template
(RETRACE)

Parameters

Options

Result
Type: NUMBER
Returns 0

Note

Example

```
(TRACE) ; set the first tracepoint
(MESSAGE "now follows an IF")
(IF (= 1 1)
  (
    (TRACE) ; this tracepoint gets lost when the installer
            ; leaves this then-block!
    (MESSAGE "then")
  )
  (MESSAGE "else")
)
(TRACE)
(RETACE)
```

This will result in an infinite loop, because the inner TRACE (situated in the then-block) gets lost and RETRACE skips to the trailing TRACE

See also

TRACE

1.99 REXX

Executes a given ARexx script with the given arguments.

Template

```
(REXX [script] [arg]* [option]* )
```

Parameters

[script] - the script to be executed
[arg] - arguments for the script

Options

PROMPT
HELP - tell the user what's going to happen
CONFIRM - if specified, the user will be asked for confirmation
SAFE - execute, even in "Pretend" mode

Result

Type: NUMBER
Returns the primary result of the script and stores the secondary result in @ioerr

Note

- this needs an active ARexx server

Example

See also

1.100 RUN

Executes a binary program with the given parameters

Template

```
(RUN [command] [arg]* [option]* )
```

Parameters

[command] - the command, which should be executed
[arg] - arguments for the command

Options

PROMPT
HELP - tell the user what's going to happen
CONFIRM - if specified, the user will be asked for confirmation
SAFE - run command, even in "Pretend" mode

Result

Type: NUMBER
Returns the primary result of the command and stores the secondary result in @ioerr

Note

Example

1.101 SELECT

Execute only one special out of more functions.

Template

```
(SELECT [num] [fun]* )
```

Parameters

[num] - specify the number of function, which should be evaluated
(starting with zero)
[fun] - several functions

Options

Result

Type: depends
Returns the result of the evaluated functions

Note

Example

```
; writes "zap"  
(SELECT 2 (MESSAGE "bla") (MESSAGE "burp") (MESSAGE "zap"))
```

See also

1.102 SET

Set a value to a variable. If this is the first setting, then this value will be declared. Access to not initialized variables will cause a runtime warning and will deliver the number zero.

Template

```
(SET [[name] [value]]* )
```

Parameters

[name] - the name of the variable
[value] - the (new) value for this variable

Options

Result

Type: depends
Returns the last setting

Note

Example

See also

1.103 SETENV

{NG}

Sets a system variable. This is only temporary done in the ENV: directory and the variable will be lost after a reset.

Template

```
(SETENV <varname> <value>)
```

Parameters

<varname> - a string which is the name of the variable
<value> - this string must contain the value for the variable

Options

Result

Type: STRING
Returns <value>

Note

The variable is only temporary set to ENV:

Example

```
(SET var "MY_TEMP_VARIABLE")  
(SETENV var "the value of my temp variable")
```

See also

GETENV

1.104 SETMEDIA

Modify properties of a media object.

Template

```
(SETMEDIA [object] [action] [actionparam]{0-1} )
```

Parameters

[object] - the media object identifier; {NG} can be either a string or an identifier of type STRING

[action] - the action, which has to be performed with the media object ↵
and
depends on the objects type; valid actions strings are
"pause"
"play"
"contents"
"index"
"retrace"
"browser_prev"
"browser_next"
"command"
"rewind"
"fastforward"
"stop"
"locate"

[actionparam] - if [action] is "command" or "locate", then this will hold the ↵
command
string argument

Options

Result

Type: NUMBER

Returns 0

Note

Example

see SHOWMEDIA

See also

SETMEDIA, SHOWMEDIA

1.105 SHIFTLEFT

Bit oriented shifting of a value. Zeros are shifted in on the opposite side.

Template

```
(SHIFTLEFT [value] [shiftamount])
```

Parameters

[value] - the value to be shifted
[shiftamount] - the amount of shifts

Options

Result

Type: NUMBER

The left-shifted [value]

Note

Example

See also

1.106 SHIFTRIGHT

Bit oriented shifting of a value. Zeros are shifted in on the opposite side.

Template

(SHIFTRIGHT [value] [shiftamount])

Parameters

[value] - the value to be shifted

[shiftamount] - the amount of shifts

Options

Result

Type: NUMBER

The right-shifted [value]

Note

Example

See also

1.107 SHOWMEDIA

This opens a datatype object (you need at least AmigaOS 3.0 for this) and presents it to the user. Depending on the type of the media object, this function can open a custom window to show the file.

Template

(SHOWMEDIA [name] [file] [position] [size] [borderflag] [attr]*)

Parameters

[name] - a string, which specifies the name for this media object; this will be used by SETMEDIA and CLOSEMEDIA functions later

[file] - the name of the file to show

[position] - if the media object needs a window (e.g. pictures or animations ←)

```

        this defines the (relative) size of the window; valid strings ←
        are:
        "upper_left"
        "upper_center"
        "upper_right"
        "center_left"
        "center"
        "center_right"
        "lower_left"
        "lower_center"
        "lower_right"
[size ] - if the media object needs a window, then this defines the
        (relative) size of the window; valid strings are:
        "none"
        "small"
        "small_medium"
        "small_large"
        "medium"
        "medium_small"
        "medium_large"
        "large"
        "large_small"
        "large_medium"
[borderflag] - if set, then the window will have scrollers in its borders, ←
        otherwise
        it gets no borders
[attr] - some attributes, which specify the datatypes attributes, valid
        strings are:
        "wordwrap"
        "panel"
        "play"
        "repeat"

```

Options

Result

Type: NUMBER

Returns 1 if the datatype could be opened, 0 otherwise

Note

Example

<to come>

See also

1.108 SHOWWBOBJECT

Makes an arbitrary workbench object visible, i.e. it scrolls the view of a workbench drawer, until the named object becomes visible

Template

```
(SHOWWBOBJECT [wbobject] )
```

Parameters

[wbobject] - the object to be viewed

Options

Result

Type: NUMBER

Returns 1, if SHOWWBOBJECT succeeded, 0 if the [wbobject] could not be found, or -1 if the machine (i.e. the Workbench) does not support this function

Note

Example

see OPENWBOBJECT

See also

see SHOWWBOBJECT, OPENWBOBJECT

1.109 SIMULATE-ERROR

{NG}

A runtime error will be simulated. This is very useful for testing and debugging scripts.

Template

(SIMULATE-ERROR <error>)

Parameters

<error> - a number value which ranges from 1 to 5. The meaning of the numbers are:

- 1 - Quit
- 2 - Out of mem
- 3 - Error in script
- 4 - DOS error (@ioerr is set to 236 (← ERROR_NOT_IMPLEMENTED))
- 5 - Bad parameter data

every other number simulates the "Out of range" error.

Options

Result

Type: NUMBER

Returns <error>

Note

The <error> argument numbers are the same as used by the TRAP function.

Example

```
(ONERROR (
    (BEEP)
    (MESSAGE "Damn, an error!")
)
(SIMULATE-ERROR 2)
```

```
(SET #err (TRAP 3 (SIMULATE-ERROR 3)
)
)
(IF (= #err 3) (MESSAGE "There was an error in the script..."))
```

See also
ONERROR, TRAP

1.110 STARTUP

Using this function, you can add commands to the users startup files. First, the Installer tries to modify the "user-startup" and if this failes, it creates a new "user-startup" and adds a call to this "user-startup" file to the "startup-sequence" (but asks for confirmation befor it writes to the "startup-sequence"). Old modifications of the application will be replaced by these new ones.

Template
(STARTUP [appname] [option]*)

Parameters
[appname] - The Installer will comment the modifications by noting the name of the application, which caused the modifications; use the @app-name variable here

Options
PROMPT
HELP - tell the user what's going to happen
CONFIRM - if specified, the user will be asked for confirmation
COMMAND - used to declare an AmigaDOS command line, which will be added to the startup script.

Result
Type: NUMBER
Returns 0

Note

Example

See also

1.111 STRLEN

Calculates the length of a given string, i.e. the number of characters

Template
(STRLEN [string])

Parameters
[string] - the string

Options

Result

Type: NUMBER

Returns the length of the string

Note

Example

1.112 SUB

Subtract all the parameters

Template

(- [value]+)

Parameters

[value] - the values to be subtracted, starting with the first one

Options

Result

Type: NUMBER

Returns the result of this chain of subtractions

Note

Example

See also

1.113 SUBSTR

Returns a substring of a given string by extracting a part of the string

Template

(SUBSTR [string] [offset] [count]{0-1})

Parameters

[string] - the original string

[offset] - number of the first character of the new substring

[count] - optional; the length of the new substring

Options

Result

Type: STRING

Returns the created substring

Note

Example

```
(SUBSTR "this is cool, isn't it?" 8 4) ; returns "cool"
```

See also

1.114 SWING

{NG}

This allows you to jump (inside of this block) from one function to its ↵ neighbour function. Thus, you may use all the ASK... functions to set the installation environment AND to have an undo/redo option

Template

```
(SWING <stmt> ...)
```

Parameters

<stmt> - one or more functions. SWING will jump between them

Options

Result

Type: number

Returns 0

Note

Example

```
(SET number 5
  text "bla"
)

(SWING
  (SET number (ASKNUMBER (PROMPT "Enter a number")
                        (HELP "...")
                        (DEFAULT number)
                      )
  )
  (SET text (ASKSTRING (PROMPT "Enter a text")
                     (HELP "...")
                     (DEFAULT text)
                   )
  )
)
```

1.115 TACKON

Add a component to an existing path. This function also cares for handling the ":" and "/" delimiters correctly

Template

```
(TACKON [path] [file])
```

Parameters

[path] - the path, which has to be expanded
[file] - the file, which will tacked on

Options

Result

Type: STRING
Returns a new path

Note

Example

see FOREACH

See also

1.116 TEXTFILE

Creates a new text file from other text files or by strings. This is useful to create configuration files scripts or environments.

Template

```
(TEXTFILE [option]* )
```

Parameters

Options

PROMPT
HELP - tell the user what's going to happen
CONFIRM - if present, then the user will be asked for confirmation
SAFE - create the file even in "Pretend" mode
APPEND - write this string to the text file
INCLUDE - include the given file into th new text file

Result

Type: NUMBER
Returns 0

Note

Example

See also

1.117 TOOLTYPE

Modify the tooltypes of an existing tool. I.e. you can set, change and delete tooltypes and the related values.

Template

```
(TOOLTYPE [option]* )
```

Parameters

Options

```
PROMPT
HELP          - tell the user what's going to happen
CONFIRM       - if specified, the user will be asked for confirmation
SAFE          - modify even in "Pretend" mode
DEST          - the name of the icon to be modified; there is no need
                to specify the ".info" extension
SETTOOLTYPE   - the tooltype name and its value string
SETDEFAULTTOOL - specify the default tool for the icon
SETSTACK      - the stack value
NOPOSITION    - clear the position of the icon
SETPOSITION   - two numbers to specify the position for the icon
SWAPCOLORS    - <obsolete, ignored>
```

Result

```
Type: NUMBER
Return 0
```

Note

Example

```
(TOOLTYPE "InstallerNG"
  (SETSTACK 50000)
  (NOPOSITION)
  (SETTOOLTYPE "MINUSER") ; remove the MINUSER tooltype
  (SETTOOLTYPE "DEFUSER" "AVERAGE") ; set the DEFUSER=AVERAGE ↵
  tooltype
  (SETTOOLTYPE "ALWAYSCONFIRM" "") ; specify the ALWAYSCONFIRM
)
```

See also

1.118 TRACE

Set a "Tracepoint" somewhere in the code. Use the function RETRACE or BACK to jump to this point. You are allowed to set as many tracepoints as you want.

Template

```
(TRACE)
```

Parameters

Options

Result

Type: NUMBER
Returns 0 (zero)

Note

Example

see RETRACE

See also

RETRACE
BACK

1.119 TRANSCRIPT

Write some text to the logfile.

Template

(TRANSCRIPT [string]*)

Parameters

[string] - the strings to write to the log. All strings will be concatenated and appended by a linefeed.

Options

Result

Type: STRING
Returns the written text

Note

Example

See also

1.120 TRAP

Used for catching errors. Works much like C "longset" function, i.e. when an error occurs while interpreting the functions inside of the TRAP, control is passed to the function rights after TRAP.

[flags] determine which errors are trapped. The trap function itself returns the error type or zero if no error occurred.

Template

(TRAP [flags] [fun]*)

Parameters

[flags] - specify the error, which should be caught; valid error codes are 1 - user abort

- 2 - out of memory
- 3 - error in script
- 4 - DOS error
- 5 - bad parameter data

[fun] - the functions, which are interpreted inside of the TRAP

Options

Result

Type: NUMBER

Returns the error code itself or zero, if no error occurred.

Note

Example

```
; #errcode holds 1 in case of an error or 0, if no error occurred
(SET #errcode (TRAP 1 ( /* do anything here, what should be trapped */ ))) {NG ←
}
```

See also

1.121 UNTIL

A list of functions will be executed until the condition holds (or: while this condition does not hold)

Template

```
(UNTIL [condition] [fun]* )
```

Parameters

[condition] - a boolean expression

[fun] - a list of functions which are executed as long as [condition] is ←
FALSE

(or until [condition] is TRUE)

Options

Result

Type: depends

Returns the result of the last function

Note

Example

```
(SET i 5) ; set a variable i to value 5
(UNTIL (= i 0) ; check whether i equals to zero
  ( ; if i doesn't equal to zero then:
    (MESSAGE "i = " i) ; - print the value of i
    (SET i (- i 1)) ; - decrement i with 1
  )
)
```

)

See also

1.122 USER

Change the user mode. You must not SET the @user variable - use USER for this.

Template
(USER [level])

Parameters
[level] - the new user level. Must be either 0 (or "novice"), 1 (or "average") or 2 (or "expert")

Options

Result
Type: NUMBER
Returns [level]

Note

Example

See also

1.123 WELCOME

Use this function to show the Welcome panel of the Installer. If the Installer cannot find WELCOME in your script, it pretends that its first function is WELCOME and, thus, initially shows the Welcome panel.

Within the Welcome panel you select the User mode (Novice, Average or Expert) and set the Logfile, the installation mode (Real or Pretend) and with the InstallerNG you can also set advanced features.

In addition, WELCOME sets the @user-level and @pretend variables.

Template
(WELCOME [string]*)

Parameters
[string] - The string arguments are prepended to the standard help text for whichever of the two initial displays appears first

Options

Result
Type: STRING

Returns the concatenated strings

Note

Example

See also

1.124 WHILE

Execute a list of functions as long as a condition holds.

Template

```
(WHILE [condition] [fun])
```

Parameters

[condition] - a boolean expression

[fun] - a list of functions which are executed as long as [condition] is \leftarrow TRUE

Options

Result

Type: depends

Returns the result of the last function

Note

Example

```
(SET i 5)                ; set a variable i to value 5
(WHILE (> i 0)            ; check whether i is greater then zero
  (
    (MESSAGE "i = " i)    ; if i is greater than zero then:
    (SET i (- i 1))       ;   - print the value of i
                          ;   - decrement i with 1
  )
)
```

See also

1.125 WORKING

The strings will be concatenated to form a message which will appear below a standard line that reads "Working on Installation". Useful if you are doing a long operation other than file copying (which has its own status display).

Template

```
(WORKING [string]* )
```

Parameters

[string] - the strings for the working text

Options

Result

Type: STRING

Returns the text

Note

Example

See also

1.126 XOR

The logical "xor", i.e. XOR delivers true if exactly one argument is true.

Template

(XOR [value1] [value2])

Parameters

[value1]

[value2] - the values which should logically be tested

Options

Result

Type: NUMBER

Returns 1 for true and 0 for false

Note

Example

See also

1.127 ALL

Template

Parameters

Options

Result

Note

Example

1.128 APPEND

Template

Parameters

Options

Result

Note

Example

1.129 ASSIGNS

Template

Parameters

Options

Result

Note

Example

1.130 BACK

Template

Parameters

Options

Result

Note

Example

See also

1.131 CHOICES

Template

Parameters

Options

Result

Note

Example

1.132 COMMAND

Template

Parameters

Options

Result

Note

Example

1.133 CONFIRM

Template

Parameters

Options

Result

Note

Example

1.134 DEFAULT

Template

Parameters

Options

Result

Note

Example

1.135 DELOPTS

Template

Parameters

Options

Result

Note

Example

1.136 DEST

Template

Parameters

Options

Result

Note

Example

1.137 DISK

Template

Parameters

Options

Result

Note

Example

1.138 FILES

Template

Parameters

Options

Result

Note

Example

1.139 FONTS

Template

Parameters

Options

Result

Note

Example

1.140 HELP

Template

Parameters

Options

Result

Note

Example

1.141 INCLUDE

Template

Parameters

Options

Result

Note

Example

1.142 INFOS

Template

Parameters

Options

Result

Note

Example

1.143 NEWNAME

Template

Parameters

Options

Result

Note

Example

1.144 NEWPATH

Template

Parameters

Options

Result

Note

Example

1.145 NOGAUGE

Template

Parameters

Options

Result

Note

Example

1.146 NOPOSITION

Template

Parameters

Options

Result

Note

Example

1.147 NOREQ

Template

Parameters

Options

Result

Note

Example

1.148 OPTIONAL

Template

Parameters

Options

Result

Note

Example

1.149 PATTERN

Template

Parameters

Options

Result

Note

Example

1.150 PROMPT

Template

Parameters

Options

Result

Note

Example

1.151 QUIET

Template

Parameters

Options

Result

Note

Example

1.152 RANGE

Template

Parameters

Options

Result

Note

Example

1.153 SAFE

Template

Parameters

Options

Result

Note

Example

1.154 SETTOOLTYPE

Template

Parameters

Options

Result

Note

Example

1.155 SETDEFAULTTOOL

Template

Parameters

Options

Result

Note

Example

1.156 SETSTACK

Template

Parameters

Options

Result

Note

Example

1.157 SOURCE

Template

Parameters

Options

Result

Note

Example

1.158 SWAPCOLORS

Template

Parameters

Options

Result

Note

Example
