AnalayDocV1.1

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Contents

Chapter 1

AnalayDocV1.1

1.1 Analay V1.1 Documentation

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Analay V1.1 Documentation

Chapter 1 : Introduction
Chapter 2 : Copyrights
Chapter 3 : Warranty
Chapter 4 : Key-File
Chapter 5 : How to order
Chapter 6 : Installation
Chapter 7 : General information
Chapter 8 : Math Mode
Chapter 9 : Layout Mode
Chapter 10: File operations
Chapter 11: About the program
Chapter 12: Known program bugs
Chapter 13: Future prospects
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1.2 Chapter 1: Introduction

```
Analay is a new math graphing program with integrated page layout. It
combines its math functions with a DTP program, enabling the user to lay out
scientific pages very quickly and easily.

For optimum speed, the two parts of the program run as separate tasks.
This means that functions can be entered and examined in the Math Mode
without being slowed down by the CPU-intensive WYSIWYG of the
Layout Mode. All windows in the Math Mode with function graphs, tables,
lists or legends are carried over into the Layout Mode automatically and can
then be combined on a page with simple graphic elements and text blocks.
Formulas can be integrated into text very easily. In addition, the page
can be created in color and, with AmigaOS 3.0, printed in color as well.
The program will make use of the highest resolution the printer driver
provides.

The possibilities for designing the functions are practically endless.
Functions and families of curves can be connected and drawn in windows
```

combined in any way. Thus you can design the function graphs and the system of axes in any way you like. In addition, texts, points, markers and hatchings can be added to the graphs.

The program supports graphic cards and the AA chipset. In addition to the bitmap fonts of the operating system, the Layout Mode supports Intellifonts®, which make a very attractive printout!

1.3 Chapter 2: Copyrights

I retain all rights to the program. The program and every key-file for the program fall under the following license:

1.1 Permitted use:

1. The program and key-file may be installed and used on multiple computers as long as they are only used by you. You may create multiple copies on hard disks and floppy disks, as long as the copies remain in your possession and the copies are not used by more than one person at the same time. The program without a key-file may be installed on as many computers and used by as many people as you like.

1.2 Unauthorized use:

The following are not allowed without the authorization of the author:

1. Changing the program or key-file.

2. Converting the program to another computer system.

3. Giving copies of the program or key-file away. If you want to pass the program on to others, you must delete all copies in your own possession.

4. Lending or renting the program or key-file, or borrowing it from others.

The program was written with the Amiga-Oberon Compiler of the A+L AG. Therefore it also falls under the license of the Amiga-Oberon Compiler of the A+L AG:

5. Neither the program nor data derived from its use may be used for military purposes, directly or indirectly.

6. Neither the program nor data derived from its use may be used in any situation where failure or inaccuracy may create a hazard to life.

Restrictions of the license for the program without key-file:

Item 3 does not apply to the program without a key-file. The program may be freely distributed and spread without a key-file, as long as no commercial use is made of it. This also includes distribution via computer networks. Inclusion of the program without key-file in PD series or PD CDs is welcome. However I would appreciate being informed of any such use.

The list of features disabled when the program is used without a key-file
can be found in the chapter Key-file.

Rights to the following files are retained by the A+L AG:

garbagecollector.library
GarbagePrefs
GCStat
garbagecollector.liesmich

1.4 Chapter 3: Warranty

The use of the program is at your own risk. The author does not guarantee
the function of the program and is therefore not responsible for
miscalculations of the program, system crashes, destroyed files, unloadable
documents, etc.

1.5 Chapter 4: Key-File

The program may be distributed without a key-file as described in the chapter
Copyrights. If the program is started without a key-file, some
functions are automatically disabled.

1. Printing and saving are not possible.
2. Loading a configuration is not possible.
3. Without a key-file, the program presents a "nag screen" before opening.

If you wish to order a key-file, refer to the chapter How to order.
This key-file must be present in the same directory as the main program
or in a directory assigned as Analay:. If the program finds a valid key-file,
all program functions are fully operable.

1.6 Chapter 5: How to order

The price of the latest version of the program with a key-file is 30.00 DM
(postage included). To order, please send cash or check in that amount to:

    Marc Necker
    Sulzauerstr. 15
    70563 Stuttgart
    Germany

E-Mail:

    UUCP   : Marc@buster.tynet.sub.org
    Fido-Net : 2:246/1115.15

You can remit the money to my bank account at the Deutsche Bank
(Konto-Nr.: 4921110, Blz.: 600 700 70) as well. Please write me a
letter/e-mail in any case, or the order might get lost.

Please send your mailing address, and your e-mail address if available.

You will receive the program and key-file by mail. Please let me know which
version of the program you are using. If I have not released a later version,
you will only need the key-file sent to your e-mail-address. This saves
both of us time and money, and you will probably get your key-file much
earlier.

Because I can only work with development and support of the program in
my leisure time, there may be a short wait before you receive your copy.
However I try to do the mailing within one or two weeks of receiving orders.

Please let me know the details of your computer system when ordering.
This will help me in planning future versions. I would especially appreciate
the foloowing information:

    Amiga model
    Version of operating-system
    Memory
    Processor/Co-processor
    Hard disk
    Printer
    Graphic card

You also can use the enclosed order form to order the program. If you
want to print out the order form, use the CD command to change the
current directory to the directory in which the order form is found.
Then type the following line in a CLI/Shell:

    copy OrderForm.asc to prt:

Ordering from foreign countries:

Outside of Germany, the same price of 30.00 DM applies. Please try to
make payment in DM. However, if you must use your local currency, please
observe the following prices:

    $20 US
    15 £ Brit.
    30 SFr.
    220 Ös.
    100 FFr.

1.7 Chapter 6: Installation

Installation of the program varies depending on your system.

1.8 Chapter 6.1: Installation on a floppy disk

This procedure requires that you have the Analay archive on a floppy disk.
Insert the disk in drive df0. To unpack the archive you need the archiver Lha
and two blank floppies.
Enter the following lines in a CLI/Shell:

```
lha e df0:Analay ram: Install2Disk
execute ram:Install2Disk
```

Everything else is done by the installation script. It will request
insertion of the disks at the appropriate times, format them, and write
the program and other files on them.

1.9 Chapter 6.2: Installation on a hard disk

Just unpack the archive to any directory on your hard disk! The program
needs the garbagecollector.library. It is to be found in the libs directory
of the Analay drawer and can be loaded from there. You also can copy this
library to the libs: drawer of your System: partition. To do this, go to a
CLI/Shell and use the CD command to change the current directory to the
Analay directory. Then enter the following line:

```
copy libs/garbagecollector.library to libs:
```

1.10 Chapter 7: General information

This chapter contains general information on the program.

1.11 Chapter 7.1: Starting the program

From the Workbench, the program can be started by double-clcking its icon.
It may also be started from the CLI, but if so, the stack might have to be
reset. To do this, use the command:

```
stack 20000
```

1.12 Chapter 7.2: System requirements

Minimum system configuration

    1.5 MByte RAM
    AmigaOS 2.0

Recommended system configuration:

    2 MByte RAM or more
    Hard disk
    AmigaOS 2.0 or later

Some functions require AmigaOS 3.0 or higher. The following restrictions apply when using AmigaOS versions earlier than 3.0:

    Only gray scales are available in the Layout Mode.
    Only black-and-white or grayscale printout is available.
    The color wheel is not available in the Layout Mode.
    The asl ScreenMode requester is available beginning with AmigaOS 2.1.
    The program is language-independent beginning with AmigaOS 2.1.

1.13 Chapter 7.3: Asynchronous program design

The program has an ansynchronous design. This means that the Math Mode and the Layout Mode run as separate tasks at the same time. Moreover the Axis limits requester of the Math Mode is also started asynchronously. Therefore you can work in the Layout Mode while analyzing a function in the Math Mode. All changes performed in the Math Mode are carried over to the Layout Mode automatically.

A window can be drawn by only one part of the program at a time. If the Math Mode and the Layout Mode attempt to draw the same window at the same time, one part of the program has to wait until the other part has finished. Similarly, a family of curves can be drawn by only one part of the program at the same time, even if the family is displayed in different windows.

The priority of each program part can be adjusted in the Priorities requester.

1.14 Chapter 7.4: The Garbage Collector

The program was written using the Amiga Oberon-Compiler of the A+L AG. It uses the Garbage Collector of this Oberon system.

The Garbage Collector takes care of memory management. It is responsible for deciding when memory blocks may be freed again. It runs as a separate task parallel to the main program and constantly checks the memory blocks which were allocated with it to determine whether they may be freed again. To prevent it from blocking the whole system it runs at a very low priority by default.

Using the Garbage Collector's preferences program GarbagePrefs you
can change the parameters of the Garbage Collector. To let the prefs program
recommend parameters which fit your system, choose the item
Werte vorschlagen in the Editieren menu. To save these settings
select the gadget Speichern.

Complete documentation for the Garbage Collector is to be found in the
enclosed file, garbagecollector.liesmich.

1.15 Chapter 7.5: Entering numerical values

When entering values, you are not restricted to simple numerals. You also
can use constant names, the built-in functions, and even arithmetical
expressions. These functions should be entered like normal functions
as described in the chapter Functionformat. For instance, instead of
6.28, you can write 2*pi.

1.16 Chapter 7.6: Online help

The program contains an online help function which can be called up from
nearly any requester. To do so, press the Help gadget to the right
of the OK gadget or press the HELP key. For reasons of space, not
every requester contains a Help gadget. In these cases you must use the
HELP key to access the online help. Please note that all string gadgets
must be deactivated for the HELP key to be operable.

1.17 Chapter 7.7: Language independence

Since AmigaOS 2.1, the program supports the locale.library and therefore
uses, if possible, the language selected in the Workbench Preferences.
The following languages are currently supported:

    German
    English

Under AmigaOS 2.0, the program only supports the English language.

1.18 Chapter 8: Math Mode

In the Math Mode, functions may be entered, processed and changed.

1.19 Chapter 8.1: Input of functions and variables

To enter new functions or variables, or to change old ones, choose
Input in the Functions menu. The requester which opens will

display two lists. The left list shows all functions entered up to this
point, and the right one shows all variables. The functions and variables
are entered in one of two special formats, the Function format or the
Variable format respectively. Selecting an existing item
in the list causes it to be displayed in the string gadget below, where it
can be edited. Hitting Return or selecting another item completes the editing
process, replacing the old item with the edited version.

New function: This gadget allows you to enter a new function to the
function list using the string gadget below the list view.

Delete function: The current function is removed from the list.
No confirmation of this action is requested!

Copy function: Pressing this gadget copies the function currently
selected into memory. It is then pasted onto (i.e. replaces) the next
function to be selected. Pressing the gadget a second time before selecting
the second function aborts the operation.

Append function: This gadget works exactly like Copy function
except that the selected function is appended to the second one instead of
replacing it.

Differentiate function: After selecting this gadget the current function
is differentiated with respect to x and the result appended to the list as
a new function. If you want to differentiate a function with respect to a
variable other than x, you will need to use the Process functions requester.

New variable This button creates a place in the list for a new
variable and places the cursor in the string gadget, where the variable can
be entered. Hitting Return adds it to the list of variables, although it
remains selected as the current one and can still be changed in the string
gadget.

Delete variable: The current variable is deleted without confirmation.

Copy variable: This gadget corresponds to the gadget Copy function.

1.20 Chapter 8.1.1: The function format

The format used to express mathematical functions is the same as in
most high-level programming languages. The four fundamental operations of
arithmetic are represented by +,-,* and /, a power by "^". Brackets are
indicated by "()". The normal "." is used as the decimal point in rational
numbers. Exponents can be appended with an "E" to figures. The multiplication
operator "*" must always be used.   (I.e. 2*x, NOT 2x.)

In all operations, the usual order of calculation is observed.

Functions are not case-sensitive.

The program understands a multitude of mathematical operations, as
listed below:

    Input   Function

sin(x)	Calculates the sine of the argument x
cos(x)	Calculates the cosine
tan(x)	Calculates the tangent
cot(x)	Calculates the cotangent
asin(x)	Calculates the arc sine
acos(x)	Calculates the arc cosine
atan(x)	Calculates the arc tangent
acot(x)	Calculates the arc cotangent
sinh(x)	Calculates the hyperbolic sine
cosh(x)	Calculates the hyperbolic cosine
tanh(x)	Calculates the hyperbolic tangent
coth(x)	Calculates the hyperbolic cotangent
sqrt(x)	Calculates the square root
root(n)(x)	Calculates the nth root
ln(x)	Calculates the natural logarithm
log(n)(x)	Calculates the logarithm base n
exp(x)	Raises e to the power of x; (e^x)
abs(x)	Calculates the absolute value

All parameters of functions must be enclosed in brackets. Exceptions are the functions with two parameters, e.g. root or log. Their first parameters may be given without brackets as long as they are composed of a single term. For example:

root3(8)	but	root(2+1)(8)
logsin(1)(8)	but	log(sin(1)+1)(8)

The program understands the following constants:

Input	Value	Units	Name
pi	3.141592654		PI
e	2.718281828		Base of natural logarithms
h	6.62618E-34	J*s	Planck's constant
c	2.99792458E8	m/s	Speed of light in vacuum
el	1.6022E-19	C	Elementary charge
me	9.1095E-31	kg	Electron rest mass
mn	1.6749E-27	kg	Neutron rest mass
mp	1.6726E-27	kg	Proton rest mass
u	1.6605519E-27	kg	Atomic mass unit
v0	22.414	dm^3/mol	Molar volume, ideal gas
n	6.02252E23	1/mol	Avogadro's constant
f	6.670E-11	m^3/(kg*s^2)	Gravitational constant
r0	8.3143	J/(mol*K)	Molar gas constant
p0	1013.25	mbar	Atmospheric pressure
k	1.38062E-23	J/K	Boltzmann's Konstante
e0	8.85419E-12	F/m	Permittivity of vacuum
m0	1.25664E-6	T*m/A	Permeability of vacuum

Symbols for constants are entered and treated exactly like numbers.
Your own constants or variables can also be used, provided that the name is not a reserved word like sin, cos, tan or x. If a variable or constant symbol is used without first having been declared as a variable or as a constant, its value is set to 0. This is not a problem if you only want to calculate a derivative.

```
Examples of proper function format:

    sin(pi/2)/(sqrt(2^3)+1)
    1e-3*sin(pi+2e6)
```

1.21 Chapter 8.1.2: The variable format

```
Variables may be used to create a family of related curves. Variables
are used in functions exactly like constants, but their values are
incremented between two limits by an amount which you specify.
When such a function is drawn, one graph for each combination of variable
values is drawn into the window. Any number of variables may be used in a
function.

Variables are entered in the following format:

    <Name>=a..b,c

<Name> is the name of the variable as it will be used when writing functions.
a is the lower limit, b the upper limit. c is the increment between
successive values as the variable is stepped from a up to b.
If c is not provided, the increment is set to 1.

Examples:

    a=1..10
    b=-1..5,2
    variable=2..0,-1
    ab=-10..10,5

The variable format can also be used to assign constant values. Simply make
the upper limit equal to the lower limit. If no upper limit is provided, this
is done automatically:

    a=1..1
    a=1
```

1.22 Chapter 8.1.3: Changing the domain of a function

```
The domain of a function is calculated automatically.
If you want to place additional restrictions on the domain,
choose the item Domain in the Functions menu. In the
requester, all currently entered functions are listed on the right side. On
the left side, all elements of the user-defined domain of the current
function are shown. This user-defined domain must not be confused with
the actual domain of a function. This item allows you to narrow the
domain further for the purpose of constructing the desired graph.


New domain: Selecting this gadget adds a new item to the list of
ranges within the user-defined domain.
```

Delete domain: This gadget deletes the current element.

Copy domain: This operation corresponds to the copy operation of the
Function input requester.

The items of the list must fit one of the following patterns:

```
    x<a    x>a     x<=a    x>=a     x=a
    a<x    a>x     a<=x    a>=x

    x#a

    a<x<b  a<x<=b  a<=x<b  a<=x<=b
    a>x>b  a>x>=b  a>=x>b  a>=x>=b
```

You must insert values for a and b. If no ranges are entered the
function is regarded as being defined at all x. As soon as ranges are
entered, the function is considered by Analay to be defined at a value x
only if this value is included in at least one of the entered ranges.
The function is not defined at a value which is excluded by x#a, even if
this value is included in other ranges. Examples:

```
0<=x<=2*pi  Plots the function in the interval [0;2*pi]. If it is a
            sine function this would be exactly one period.
```

Example with functions:

```
Entered function:            Entered user-defined domain:

x*ln(x^2/a)                  x#0
0                            x=0
```

Both function can then be connected. Since the user-defined domains
of connected functions must not overlap you have to restrict them manually
as shown in this example.

1.23 Chapter 8.1.4: Connecting functions

To connect functions, choose the item Connect functions in the
Functions menu. A requester will open which shows, on the right,
a list of all functions entered so far. On the left side, all connected
functions are listed. In the middle, all functions making up the selected
connection on the left are listed. In the string gadget below the left
listview, you can change the name of the current connection.

New connection: Appends a new connection to the list.

Delete connection: Deletes the current connection.

Copy connection: This operation works like the copy function of the
Function input requester.

Take function: This gadget adds the selected "available function"
to the list of connected functions.

Delete function: This gadget removes a function from a connection.

The domains of functions making up a connection may not overlap. This will
probably necessitate changing the user-defined domain.

Connected functions are processed and treated in other ways exactly like
ordinary functions.

1.24 Chapter 8.1.5: Processing functions symbolically

To process functions symbolically choose the item Process in the
Functions menu. A requester will open which has gadgets for all
operations. Select the function you wish to process, and then click on
the appropriate gadget.

Differentiate function: After selecting this gadget you'll be asked by the
String input requester for the variable with respect to which the function
will be differentiated. The derivative will be inserted in the list as a new
function, just after the original one.

Tangent at point P: After you have entered the coordinates of a point
using the Point input requester, the formula for the tangent at this point
is created and inserted in the list after the original function.
The y-value of the point is calculated automatically. Tangents may not be
calculated in undefined ranges.

Normal at point P: This function corresponds to the operation
Tangent at point P. The formula for the normal is entered in the list.

Reflect function: With this operation, you can reflect the current
function horizontally, vertically, or through a point. When this gadget is
selected, the Reflect requester opens and you can select
how you want the function to be reflected. The new function is inserted after
the original one in the functions listview.

1.25 Difference between symbolical and numerical

The analysis and the processing of functions is divided up into two
methods: symbolical and numerical methods.

When analysing a function with a numerical method the program only works
with a table of the function values to find e.g. the zeros of this
function. When doing this symbolically the program does not use the table
of the function but the function term itself. That means the symbolical
processing of functions is much more precise than the numerical. For example
the numerical analysis of the function sin(x) would give for the zeros
0, 3.14, 6.28, ... Instead, the symbloical analysis would give
0, pi, 2*pi, ... When analysing the function sin(tan(x)) a numerical

method could never find all zeros of this function, because there is an
infinite number of zeros. A good symbolical math program could say
exactly this, that there is an infinite number of zeros.

Though Analay is not yet capable to analysis functions symbolically it can
process functions symbolically. Therefore you can, e.g., differentiate
functions symbolically what means that the function term of the
derivative is created, whereas a numerical differentiation only could
plot the graph of the derivative, but could not create the function term.

1.26 The String input requester

In this requester you can enter a string.

1.27 The Point input requester

This requester lets you enter the coordinates of a point on the system of axes.

x-coord: Here you can enter the x-coordinate of the point.

y-coord: Here you can enter the y-coordinate of the point. If this
gadget says auto and is not selectable, the y-coordinate is calculated
automatically from the x-coordinate given.

1.28 The Reflect requester

This requester lets you determine how the function is reflected.

through line x=: If this item is selected, the function is reflected at a
line parallel to the y-axis. The distance from the y-axis can be specified
in the string gadget after the text.

through line y=: If this item is selected, the function is reflected at a
line parallel to the x-axis. The distance to the x-axis can be specified
in the string gadget after the text.

through point: If this point is selected, the function is reflected through a
point. The coordinates of the point are entered in the string-gadgets
below the text.

1.29 Chapter 8.2: Plotting functions

In Math Mode a window is opened for each separate display. The number of windows
is not limited. To create new function windows, choose the item Create
in the Windows menu. A requester will open showing on its left side a
list of all windows opened at the moment. You can change the name of the
current window in the string gadget below the list. If you have more than one

window, you should give each one its own name to keep from confusing them.

The list in the middle contains all functions plotted in the current window.

The list on the right side contains all currently entered functions and connections.

New window: A new window is created and appended to the list of windows. It is selected as the current window so that you can edit it immediately.

Delete window: The current window is deleted.

Copy window: This gadget enables you to make a copy of a window in order to continue working on a project while preserving the original. After selecting the window you wish to copy and clicking the gadget, either select an existing window name for replacement or click in a space previously created with the "New window" button. Only the functions of the first window get copied to the second one. Other attributes, such as ranges colors and styles, are not copied.

Selecting this gadget a second time aborts the operation.

Append window: This gadget works like Copy window except that the functions of the first window are added to those of the second window.

Take function: The current function of the right list is entered in the list of functions of the current window.

Delete function: The current function in the list of functions of the current window gets deleted.

1.30 Chapter 8.2.1: Changing the axis limits

The ranges of the x- and y-axes of a graph may be changed by using either the keyboard or the mouse.

Changing axis limits in requester
Changing axis limits with the mouse

1.31 Changing axis limits in requester

To change the axis limits of a window, choose the item Axis range in the Windows menu. After you select the window on which you want to perform the changes, a requester displays x- and y-axes, with a string gadget indicating the current extent of each axis. New values may be entered in these string gadgets.

Undo changes: Selecting this gadget restores the values to those in place when the requester was opened the last time. If you changed the

axis ranges unintentionally by mouse, you can undo the change
with this gadget.

1.32 Changing axis ranges with the mouse

The axis limits can also be very easily changed with the mouse.

If the desired range is completely visible within the window and the pointer
is dragged from one point to another, the box that is visible while the
left mouse button is depressed will show the margins of an area which will,
when the button is released, be expanded to the boundaries of the window.

If you wish to expand the graph to include areas not visible in the window,
start dragging the mouse at a point within the window, but release it outside
the window at a point which would correspond to the desired values if the
window were larger. The area within the box will then be shrunk into the
existing window.

Expanding the range outside the existing window in all directions is thus a
two-stage process of dragging from, say, upper left (in the window) to lower
right, then from the newly included point in the lower right to the desired
point outside the window at the upper left.

This function can be aborted by pressing the right mouse button.

1.33 Chapter 8.2.2: Changing the axis labels

To change the design of a window's system of coordinate axes, choose the
item Axis design in the Windows menu. After selecting a window,
you can perform the changes in the requester which opens.

Axis system on: When this box is checked, axes and scales are
visible. Clicking the check box will toggle them off.

Axis design This area is used to determine labels, figures and
markers along the axes.

Values: Specify the interval between the values appearing along
the axes. The points referred to by these values are indicated by tick
marks on the axes. The figures can be switched on and off by using the
check box.

Ticks 1: Two lengths of tick marks may be used. Ticks 1 refers to
the major or longer ticks. The interval between tick marks is entered in
the text gadget. Ticks may be switched on or off with the check box.

Ticks 2: The interval between the smaller ticks is entered in the
same way as above. The markings can be switched on or off using the
check box.

x-axis label: The label on the x-axis may be changed by entering

a string in the text gadget. However, you still must use "x" to indicate the independent variable when writing function terms! The status of the check box determines whether the label is displayed.

y-axis label: The y-axis label may be changed by entering a new string in the text gadget. The check box switches the name on or off.

Font: This gadget opens the font requester of the operating system, enabling the font of the axis labels and figures to be selected.

Axis design: In this area you can change the design of the system of axes.

Color: Enables selection of the color of the axes.

Line pattern: Enables selection of the line pattern of the axes.

Line thickness: Enables selection of the thickness of the axis lines.

Arrow: Enables selection of the arrow at the end of each axis.

1.34 Chapter 8.2.3: Changing the grid

To change the grid which is drawn as the background of the window, choose the item Grid in the Windows menu. After selecting a window you can change the grid in the requester.
Two independent grids can be displayed in one window.

Grid active: This check box switches the grid on or off.

Settings: These specifications determine the placement and intervals of the grids.

Interval: The text gadgets allow you to specify the interval between the grid lines. x and y intervals are independent and specified separately.

Start coordinates: Here you can specify the origin of the grid. The lines of the grid are drawn in each direction starting at the origin.

Grid design: These specifications determine the design of the grid lines.

Color: Here you can select a color for the grid lines.

Line pattern: Here you can change the pattern of the grid lines.

Line thickness: Here you can change the thickness of the grid lines.

1.35 Chapter 8.2.4: Changing the graph design

To change the appearance of the function curves in a window, choose the item Graph design~in the Windows menu. After selecting a window you can independently alter the design of each of the functions displayed in this window.

All functions plotted in the window are listed in the listview titled "Functions". If the currently selected function represents a family of curves, all possible combinations of its variables are listed in the list on the right. Each appearance of each curve in the family can also be changed independently. On the left side are gadgets for changing the design of the currently selected function.

Color: Enables selection of color of the current function's curve.

Line pattern: Enables selection of the line pattern of the current function's curve.

Line thickness: Enables selection of the thickness of the line used to draw the curve of the current function.

1.36 Chapter 8.2.5: General settings of function windows

To change the general settings of a function window, choose the item Settings in the Windows menu. After selecting a window, you can change the general settings of this window in the requester. The upper area contains some information about the window. Below this are the gadgets with which you can change the settings of the window.

Transparent: If this item is activated, other windows in the back will appear through it. This only has an effect on the Layout Mode.

Border free: If this item is activated, the drawing area reaches to the border of the window. Otherwise, the border of the window will also be used for drawing.

Auto y-range: If this item is activated, the range of the y-axis is automatically calculated in order to show the full extent of the curve in the specified domain. If the y-axis range is changed by mouse or by using the requester, this item is automatically deactivated.

Auto axis labels: If this item is activated, the labels of the axes are adapted to new window sizes automatically. This prevents them from overlapping. As soon as the labels are changed by hand, this item is automatically deactivated.

Auto grid: If this item is activated, the background grid of the window is adapted automatically to the axis labels. If the grid is changed by hand, this item is automatically deactivated.

Background color: Here you can select the color of the background

of a graph. In order for this function to work correctly in the Layout Mode, Transparent must be deactivated in this requester.

Calculation This text gadget allows you to specify the number of points that are calculated for a graph. The more points, the more exact the function will be drawn, but also the longer the calculation will take. More points than the horizontal screen resolution do not improve the quality very much.

1.37 Chapter 8.3: Quick-input

If you only want to create one window with a single function graph, the use of the Input requester and the Plot requester is a bit complicated. In this case you can choose the item Quick-input in the Windows-menu. A requester opens in which you can enter a function. Pressing RETURN or clicking on OK will close the requester and open a new window with a plot of the new function.

1.38 Chapter 8.4: Input of constants

Analay is able to understand frequently used numerical values if they have been entered into its tables of constants.

Each entry in a constant table consists of a symbol, a value, and an optional comment. The symbol is the alphanumeric string which, when used within a function, will be recognized by Analay, and for which Analay will substitute the corresponding value. The comment is a convenient place to note the name of the constant, the units it designates, or the use to which you might put it.

There are two such tables, referred to as internal constants and temporary constants respectively. Both tables may be changed by the user.

The table of internal constants initially contains those constants listed in the chapter Function format. These, along with any that are added to this table, are saved with the configuration in the Settings menu, and can therefore be brought into Analay each time the program is started, or imported with various configurations which have previously been saved.

Temporary constants, on the other hand, are saved with individual files, and are not available in projects other than the one in which they were created.

To enter new constants or change old ones, choose the item Change constants in the Functions menu. The requester which opens contains a list of all constants. You can change the symbol, the value and the comment of a selected constant in the string gadgets below the listview or enter a new one. Also the chapter The Analysis data requester for an alternative way of entering calculated values into the table of temporary constants.

Internal constants, Temporary constants: This gadget switches between
internal and temporary constant tables in the listview.

New constant: This gadget allows a new constant symbol, value, and
comment to be entered in the string gadget below the list. It is appended
to the list and selected as the current constant.

Delete constant: Deletes the current constant.

Copy constant: This gadget copies the current constant. When
a second constant (or a blank line created by "New constant") is selected,
the copy is pasted.

1.39 Chapter 8.4.1: The constant input requester

In this requester you can change one single constant. Three gadgets are
provided to enter the symbol, the value and the comment of the constant
respectively. See Input of constants for further information.

1.40 Chapter 8.5: Analysis of curves

The operations for analyzing functions are to be found in the Analyze menu.
All analyses are performed with a numerical precision of six decimal places.
The examinations of a Complete analysis can be performed with
a precision of up to 8 decimals.
Analyses are restricted to the domain of the function shown in the
selected window.

1.41 Chapter 8.5.1: Zeros

To determine the zeros of a function, choose the item Find zeros in
the Analyze menu. After selecting a window, you are asked to select the
function to be analyzed. After that a window is opened which shows the
progress of the analysis.

When the program has finished the search, all zeros in the domain examined
are listed in the Zeros requester.
The comments indicate the change in sign as the value of x increases.

Every zero the program finds meets the following condition:

```
-0.00001<=f(x)<=0.00001
```

1.42 Chapter 8.5.2: Extreme points

To determine the extreme points of a function, choose the item
Find extremes in the Analyze menu. After the selection of a window
you are asked to select the function whose extreme points are to be found.

After that a window opens in which you can follow the search by watching
the bar. The search is performed separately for maximum and minimum points,
so you will see the bar get built up twice.

When the program has finished the search, all extreme points found are
displayed in the Extreme points requester. Comments
will note whether a point is a maximum or a minimum and if it is
an absolute or a local one. If the program writes a question mark behind
absolute, the program is unable to determine that this is an absolute extreme
for the entire domain in which the function is defined, but it will represent
the limit of the function's range in the domain which has been analyzed.

1.43 Chapter 8.5.3: Points of inflection

To determine the points of inflection of a function, choose the item
Find points of inflection in the Analyze menu. After the
selection of a window, you are asked to choose the function whose
points of inflection you wish to locate.

A window opens in which you can follow the search by watching the bar.

First, the second derivative of the function is calculated, and then a
value-table of the derivative is created. Therefore you will see the bar
get built up twice.

As soon as all points of inflection are found, they are displayed in
the Points of inflection requester. The comments note whether
the function's curvature changes from right to left or vice versa.

1.44 Chapter 8.5.4: Definition gaps

To determine the definition gaps of a function, choose the item
Find gaps~in the Analyze menu. After selecting a window,
you are asked to choose the function whose definition gaps you want the
program to determine.

After that a window is opened in which you can follow the search by
watching the bar.
When the program has finished the search, the gaps are listed in the
Gaps requester.

1.45 Chapter 8.5.5: Points of intersection

To determine the points of intersection of two functions, choose the item
Find intersections in the Analyze menu. After selecting a window,

you are asked to select from the window's function list the two functions
whose intersections you want the program to calculate.

After that, a window is opened in which you can follow the search by
observing the bar.

As soon as all points of intersection are found they are displayed
in the Intersections requester.

1.46 Chapter 8.5.6: The Analysis data requester

After a function is analyzed by Analay, the results are displayed in the
Analysis data requester. In the upper area, the function or functions under
consideration and their domain are displayed. Beneath that, the results of
the analysis of the curve are listed. Every entry consists of an abscissa
(x-coordinate), an ordinate (y-coordinate) and a comment.

By double-clicking on an entry with the left mouse button, you can
define the x-coordinate as a constant for the program. It will be appended
as a temporary constant to the list of constants. Then you can change
the constant in the Constant input requester.
See chapter Input of constants for further information.

as list, as points, as markers: Here you can state how the results
will be recorded when leaving the requester with OK. If you select list,
a new list will be created containing the abscissa and
the ordinate of each result in two columns. If points is selected, the results
are indicated as points on the graph of the function.
If markers is selected, vertical lines are drawn on the
graph at the abscissa.

When selecting point or marker, a requester opens in which a default name
for the first point or marker appears. The last digit or letter of the name
is incremented with each successive point or marker as shown:

```
A1, A2, A3, A4, ...
A, B, C, D, ...
```

default, custom: Here you can choose whether the program will use the
default list, point, and marker formats to record the results, or open a
requester to allow you to customize their appearance.

1.47 Chapter 8.5.7: Complete analysis

To perform a complete analysis of a function choose the item
Complete analysis in the Analyze menu. After selecting a window,
choose out of the list of functions presented the function which you wish
to have analyzed.
A window with a listview and several gadgets at the bottom will open. The
listview contains the results of the examination. By selecting Cancel you
can abort the examination.

Print: The results are printed using the printer driver and settings
selected in Workbench Preferences.

Textbox: A text block containing a description of the curve will be
created in the Layout Mode, where it may be further formatted prior to
printing.

The following attributes of the function can be calculated and described:

    Derivatives
    Symmetry
    Zeros
    Extreme points
    Points of inflection

You can determine which examinations the program actually performs with
the Complete analysis settings requester.

1.48 Chapter 8.5.8: Complete analysis settings

To change the settings for the complete analysis, choose the item
Compl. analysis settings in the Analyze menu. The requester
lets you choose which operations will be performed by toggling the check
boxes.

max. degree: Allows you to specify the number of derivatives the program
will calculate. If you want to calculate past the tenth derivative, you will
have to do this in the Input requester or in the Process requester.

Decimal places: Allows you to specify the precision of the calculations.

1.49 Chapter 8.5.9: Calculation of areas

To obtain the area between two functions, choose the item Calculate area
in the Analyze menu. In the requester which opens, you can enter
two functions and two x-coordinates between which the surface will be
calculated. The calculation uses the trapezium method.

Area between functions: In this area, you can specify the boundaries
of the area.

Functions: Here you may type two different functions or select
the A after the string gadgets, which brings up the list of functions
which have previously been entered. Selecting a function copies it into
the corresponding string gadget. If you only want to calculate the area
between a function and the x-axis, you may just enter 0 or nothing for the
second function.

from: Enter the lower limit of x.

to: Enter the upper limit of x.

absolute, oriented, rotation: There are three options for calculations of area on a graph. The items are defined as follows:

absolute: The absolute area between the two functions is calculated. This means the real contents of the area between both functions.

oriented: The oriented area between the two functions is calculated. In contrast to the absolute area the sign is considered. The contents of the area is positive if function 1 lies above function 2. Otherwise it is negative. For example a simple sine function comprises with the x-axis an absolute area of which the contents is>0. However the contents of the oriented area is=0 since the same amount of area lies above and below the x-axis.

Rotation: If rotation is selected not the contents of te area between the functions is created but the volume of the figure which is created by rotating the area around the x-axis.

0.1 .. 0.0001: This selection determines the precision of the calculation. The values correspond to the width of the trapeziums used in the calculations.

Smaller values don't necessarily improve the result very much, and they can require much more time.

Calculate: This gadget starts the calculation. The result of the calculation is displayed in the field next to Result. By pressing the right mouse-button you can abort the calculation.

Hatch surface: This part of the requester gives you an opportunity to choose whether to highlight the area defined in the top part of the requester, and if so, in what way.

Hatch surface: The status of the check box determines whether the area is hatched. If this item is checked when you leave the requester with OK, another requester will pop up to allow you to select a window in which the area will be highlighted.

Default hatching, Custom hatching: If Custom hatching is chosen, a requester will open, giving you a chance to choose hatching color and pattern.

1.50 Chapter 8.6: Objects in function windows

The following objects can be placed in a function window:

- Text lines
- Points
- Markers
- Hatchings

Objects can be changed using the menu items Text, Point, Marker, Hatching
in the Windows menu.

These menu items are subdivided as follows:

Create: This item will open a requester allowing you to enter the
parameters needed to define the particular object. It will appear on the
graph when the requester is closed.

Change: To change an already existing object, select this item.
Afterwards select a window out of the given list. Then move the pointer over
the object you want to change. As soon as the object is framed, press the
left mouse button. This will open the specific requester in which you can
change the object.

Hatchings form an exception. They cannot be selected by clicking,
but must be selected out of a list by their names.

Delete: You may delete an already existing object by selecting this item
and afterwards the window containing the object. Then move the pointer
over the object to frame it and press the left mouse button.

The hatchings form an exception. They cannot be deleted by clicking, but
must be selected out of a list by their names.

Default: This allows you to choose the corresponding default format
for each object type. The settings of the default object are used when
creating a new object.

1.51 Chapter 8.6.1: Input of object coordinates

The method of entering coordinates is identical for texts, points and markers.
The coordinates are entered in the lower region of the requester.

Hatchings have their own method of dimensioning.

x: Enter an x-coordinate here.

y: Enter a y-coordinate here.

Snap to graph: The status of this check box determines whether the
y-coordinate of the object is to be adjusted to the y-coordinates of
functions displayed in the window.

Mouse: After selecting this gadget, the window containing the object is
brought to the foreground and you can place the object with the mouse. After
pressing the left mouse button, the requester is brought to the foreground
again. You can abort this operation by pressing the right mouse button.

Axis coordinates, Screen coordinates: Here you can determine
whether the coordinates you enter will be interpreted as graph or screen
coordinates.

Axis coordinates are entered as normal coordinates in the system of

coordinate axes. Changing the axis limits or the size of a window therefore
affects the position of the object in the window.

Screen coordinates are entered as pixel coordinates relative to the
upper left edge of the window. Changing the axis limits or the size of
the window does not affect the position of the object in the window.

1.52 Chapter 8.6.2: Moving objects by mouse

Texts, points and markers can be moved by the mouse just by moving
the pointer over an object, pressing the left button, and dragging the object
to its new position. Release the mouse button to drop the object.

Pressing the right mouse button aborts the operation.

1.53 Chapter 8.6.3: Text input on objects

With texts, points and markers, you can enter text to be attached to
the object. Any text you type into the string gadget or select from the
listview above it will be inserted. Within the text, you can
use any of several commands, all of which are indicated by a $-sign. All
commands supported at this time are for inserting the coordinates of the
object into the text.

$x : Inserts the x-coordinate of the object into the text.
$y : Inserts the y-coordinate of the object into the text.
$$: Inserts a $-sign into the text.

1.54 Chapter 8.6.4: Texts

In the upper area of the text requester, you can change the appearance
of the text. In the lower region you can change the coorinates of the
text, as described in the chapter Input of object coordinates.

Text: Use the string gadget to enter the text that you want to
place on the graph.

Foreground color: Select the color of the text.

Background color: Select the color for the background of the text.
This is disregarded if the item Transparent is checked.

Font: You may choose any font in your system for the text. This is
done using the font requester of the asl library.

Bold: If this item is checked, the text is written bold.

Italic: If this item is checked, the text is written italic.

Underlined: If this item is checked, the text is underlined.

Transparent: If this item is checked, the text is written transparent. Otherwise, the background of the text is filled with the selected background color.

1.55 Chapter 8.6.5: Points

In the upper area of this requester, you can change the appearance of the point. In the lower region, the point's coordinates can be entered, as described in the chapter Input of object coordinates.

Name: Here you can enter the name of the point. It will be written to the right of the point.

Pattern: Selecting a pattern out of the list will cause certain text, such as coordinates, to be appended to the name of the point. The current pattern can be edited in the string gadget below the listview. The pattern is entered as described in the chapter Text input on objects.

New pattern: This gadget allows you to append a new pattern to the list.

Delete pattern: This gadget deletes the currently selected pattern. of the list.

Foreground color: Select the color for the point and its label.

Background color: Select the color for the background of the point's label. This is disregarded if the item Text transparent is checked.

Text transparent: If this item is checked, the point's label is transparent. Otherwise the background is filled out with the selected background color.

Point design: Selecting this gadget brings up the Point design requester, which permits selection of any of several point designs.

Number format: You may specify the format of numbers which are inserted into the text using the commands described in the chapter Text input on objects. After selecting this gadget the Number format requester opens, and you may specify the number of decimal places and whether or not exponential format will be used.

Font: You may specify the font of the point's label. This is done through the Font requester of the asl library.

1.56 The point design requester

In this requester you can change the appearance of the point itself.

Point: This area lets you select from the point types presented.

Fill point: This item only works if you have selected a rectangle or
a circle as the point type. If it is checked, the point will be filled with the
background color you have selected.

1.57 Chapter 8.6.6: Markers

This requester corresponds to the Point requester. Only the
differences are described in the following passage.

The marker's label is written beside the marker at the height of the
y-coordinate.

Marker design: This button brings up the Marker design requester, in
which you can change the design of the marker.

1.58 The marker design requester

In this requester you can change the appearance of the marking.

Marker design: In this area you can change the appearance of the marker.

Marker pattern: You can select from several line patterns the one you
desire for the marker.

Marker width: Here you can select the width of the marker.

Marker label: In this area you can change the appearance of the
marker's label.

Text orientation: The orientation of the label is controlled here.
The label can be written either in the ordinary way from left to right,
from top to bottom, or rotated by 90 degrees either way.

Text position: Here you can select which side of the marker the label will
be written on.

1.59 Chapter 8.6.7: Hatchings

The hatching requester lets you change the appearance and the boundaries of a
hatching. The boundaries can be changed in the upper section of the requester,
and the design can be changed in the lower part. The nature of hatchings
dictates that they be controlled in a completely different way from other
objects.

A hatching is restricted by several boundary elements. For example a hatching
can be drawn between two function curves. In a more complicated graph, you
might wish to specify an area to the left of a pre-defined marker, above the

x-axis, below a function curve, and less than a specified y value.

Hatching bounds: In this area, you can specify the elements which border the hatching.

Boundary elements: In this list, all boundary elements of the hatching are shown. In the string gadget below the listview, you can change the name of the currently selected element. You can change the type of the current element using the radio buttons below the list.

New element: This button makes space in the list to add a new boundary-element.

Delete element: This button deletes the current boundary element.

x-axis: This button causes the hatching to be drawn above or below the x-axis.

y-axis: This button causes the hatching to be drawn to the right or left of the y-axis.

x-value: This button causes the hatching to be drawn to the right or left of a certain x-value.

y-value: This button causes the hatching to be drawn above or below a certain y-value.

Function: This button causes the hatching to be drawn above or below a function curve.

Point: This button causes the hatching to be drawn in one of four quadrants relative to the point specified by the coordinates, either upper right, upper left, lower right, or lower left.

Marker: This button causes the hatching to be drawn to the right or left of a specified marker.

Hatching name: You may identify each hatching by name. Separate names for each may eliminate confusion when referring to them later.

Current element: Here you can change the position of the hatching relative to the current boundary element. The type of element is represented in the field (in a standardized form, not as you have defined the specific element) with the hatching position relative to that element indicated by the shaded area. By clicking in the field with the mouse, you can change the position of the hatching. You can do this with the cycle gadget below the field, as well.

Function, Point, Marker: A boundary element may be either one of the axes, a specified x- or y-value, or any of the other object types (except text, of course) which you define and place on the graph. If you wish a certain boundary to be a function, point or marker, select that type with one of the buttons, and you will see that choice appear to the left of the long text gadget. If you have pre-defined objects of that type, the list of such objects will appear in a separate window if you click the "A" button to the right of the gadget, and you may select the object from that list. Alternately, you may enter its name into the text gadget from the keyboard.

x: If you wish the hatching to appear only where x is more or less
than a certain value, enter that value here.

y: If you wish the hatching to appear only where y is more or less
than a certain value, enter that value here.

Hatching design: In this area you are given several choices about
how the hatching will appear.

Color: You may select the color of the hatching lines.

Pattern: You may select a pattern for the hatching from several
predefined patterns.

Clear background: If this item is checked, the hatching will appear
opaque, obscuring everything behind it.

Hatching to the back: If this item is selected the hatching is
drawn behind the axes, curves, and other objects on the graph. Otherwise
the hatching is drawn in the foreground and will obscure these objects.

1.60 Chapter 8.7: Legends, tables, lists

Legends, tables and lists can be created very easily. The menu items for
these are found in the Special menu. They are subdivided, like
the menu items for objects, into the following subitems:

Create: This selection is for creating a new legend, table or list.

Change: This selection lets you change an already existing legend,
table or list. You will be given a list of existing objects of the same type
from which to select the one you want to modify.

Delete: This selection deletes the existing legend, table or
list which you have selected from the listview.

Default: This allows you to change the default style of the legend,
table, or list. The parameters you select are used whenever a new one is
created.

Every legend, table or list is displayed in its own window. The contents of
the window are adapted to the size of the window automatically when changing
its size.

1.61 Chapter 8.7.1: Legends

The right side of the legend requester contains a preview of the legend.
The controls for changing the legend are found on the left side.

Every line of a legend consists of a symbol and a text following the symbol. The lines of a legend are either functions or families of curves. Families can be indented, so that with a family the general version is written first and the combinations of the variables indented in the following lines.

Legend general: This area contains controls for the general layout of the legend.

Append line: This button appends a new line to the legend.

Insert line: This button inserts a new line before the current line.

Delete line: This button deletes the current line.

After window: This button instructs the program to create a legend automatically from a function window. Each function displayed in the window will be symbolized in the legend by a line with the same color, pattern and thickness as used to graph that function.

This gadget will open a requester permitting you to choose the function window first.

Afterwards you may determine how the window's contents are to be inserted into the legend using the opening requester.

Functions uniform: If this item is checked, all functions in the legend will be represented by the same type of symbol.

Families uniform: If this item is checked, all families in the legend will be represented by the same type of symbol.

Indent families: If this item is checked, lines for families are indented.

Link to window: If this item is checked, the legend is linked to the window from which it was automatically created, and it will be updated when changes are made in this window.

Current line: In this area, you can change attributes of the currently selected line.

Color: Select the color of the symbol on the current line.

Line pattern: Select the line pattern for the symbol.

Symbol design: Select a symbol for the line.

Line thickness: Select the thickness of the current line's symbol.

Family: Check this box if the current line represents a family of curves.

1.62 The requester to take over functions of a window

In this requester you can determine how the contents of a function window will be inserted into the legend. If the cycle gadget shows "Delete legend," the legend preview will be cleared before the legend of the function window is written into it. If it reads "Append window," the legend for the selected window will be added to the existing legend in the preview. If it reads "Insert window," the legend of the window will be inserted before a line you have previously selected in the preview.

The lower part of this requester lets you specify the symbols for functions and families. Every function of the window is included in the legend. If the window contains a family of curves, the general form of the function is inserted into the legend first, followed by the combinations of the variables.

1.63 Chapter 8.7.2: Tables

The upper portion of the table requester displays a preview of the table, and the lower area contains gadgets for designing it.

Every table consists of several rows, each containing the same number of columns.

To process a row, select it by clicking on it.

At the lower right, all columns of the currently selected row are listed. You can change the contents of the current column with the string gadget below the listview.

Process table: In this realm you can change the general arrangement of the table.

Append row: Selecting this will append a new row to the table.

Insert row: This gadget will insert a new row in the table above the current row.

Delete row: This gadget will delete the current row.

Font: You can use any font in your system for the table. This is done using the font requester of the asl library.

Table design: This button opens the Table and list design requester, in which you may specify the way in which rows and columns are separated.

Uniform col-width: If this item is selected, all columns have the width of the widest column.

Center text: If this item is activated, the text is centered in the cells. Otherwise, text is left-justified.

This item and Decimal tabulator are mutually exclusive.

Decimal tabulator: If this item is activated, the text in each
column is aligned on the decimal point.

This item and Center text are mutually exclusive.

Separate column 1: If this item is activated, the first column of
every row is set off a small amount from the rest.

Name: You may specify a name for each table you create. This will
eliminate confusion when referring to them in requesters.

Append column: This gadget appends a new column to every row.

Insert column: This gadget inserts a new column before the current one.

Delete column: Selecting this gadget deletes the currently selected row.
Note that the column is deleted in every row!

Value range: You can insert a sequence of numbers into the current row.
New columns are created which are empty in all other rows. After selecting
this gadget the Value range requester opens, allowing you to
specify the range of values.

Calculate row: The program will calculate a row of values
using a function and x-values you specify.

First, select the row into which the calculated values are to be entered.

Next, select this gadget, and then click on the row which contains the
x-values.

You will then be prompted to select a function. The Number format requester
will open, letting you specify the format of the values entered into the
table.

The row will then be filled out with the calculated y-values.

1.64 Chapter 8.7.3: Lists

The right portion of the list requester contains a preview of the list.
The area on the left is for setting up or changing the list.

Every list consists of several columns, each of which may contain a different
number of lines. The current column to be changed is selected by clicking on
it. At the lower left, all lines of the current column appear in a listview
entitled "Entries." You can alter the current line in the string gadget below
the list.

Process list: This area contains controls with which you can change
the general arrangement of the list.

Append column: This gadget appends a new column to the list.

Insert column: This gadget inserts a new column into the list before
the current column.

Delete column: This gadget deletes the current column.

List design: This button opens the Table and list design requester,
in which you may specify the way in which lines and columns are separated.

Font: You can use any font in your system for the list. This is
done using the font requester of the asl library.

Column width uniform: If this item is checked, all columns will be
adjusted to the width of the widest column.

Center text: If this item is activated, the text is centered in the
cells. Otherwise the text is left-justified.

This item and Decimal tabulator are mutually exclusive.

Decimal tabulator: If this item is activated, the text in each
column is aligned on the decimal point.

This item and Center text are mutually exclusive.

Separate headline: If this item is activated, the first line of the
list is separated from the rest.

N° of fields uniform: If this item is activated, all columns will
have the same number of lines. If you append, insert or delete a line in one
column, all columns will be affected.

Name: You may specify a name for each list you create. This will
eliminate confusion when referring to them in requesters.

Current column: In this area, you can modify the current column.

Append line: A new line is appended to the end of the current column.

Insert line: A new line is inserted before the current line.

Delete line: The current line is deleted.

Value range: You can insert a sequence of numbers before the
current line into the column. New lines are created and inserted into the
column. Selecting this gadget opens the Value range requester,
in which you can specify the range to be used.

Calculate column: The program will calculate a row of values
using a function and x-values you specify.

First, select the column into which the calculated values are to be entered.

Next, select this gadget, and then click on the column which contains the
x-values.

You will then be prompted to select a function. The Number format requester

will open, letting you specify the format of the values entered into the table.

The column will then be filled out with the calculated y-values.

1.65 The table and list design requester

In this requester you can change the appearance of tables and lists. The right section displays a preview of the table or list. You can change the design with the gadgets on the left.

Horizontal separation: Select the type of horizontal line used to separate the rows.

Vertical separation: Select the type of vertical line used to separate the columns.

Color: Select the color for the separation lines. Only the lines with a single color are affected, not the three-dimensional lines.

1.66 The number format requester

In this requester you can determine the format for numbers which the program creates automatically.

Exponent: If this item is checked, numbers are written using an exponent.

Decimal places: This determines the numbers of digits after the decimal point.

1.67 The value range requester

In this requester, you select the range for a sequence of numbers.

Start: Here you can enter the start value of the sequence.

End: Here you can enter the end value of the sequence.

Interval: Here you can enter the interval between values of the sequence.

Exponent: If this box is checked, an exponent is used when writing the numbers of the sequence.

Decimal places: This gadget determines the number of digits after the decimal point.

1.68 Chapter 8.8: Changing the screen resolution

To change the resolution of the screen of the Math Mode, choose the item Resolution in the Settings menu.

Changing the resolution under AmigaOS 2.1 or higher
Changing the resolution under AmigaOS 2.0

1.69 Changing the resolution under AmigaOS 2.1 or higher

Starting with AmigaOS 2.1, the screen mode requester of the asl library is used.

1.70 Changing the resolution under AmigaOS 2.0

The points in this requester correspond to those of the screen mode requester of the asl library.

1.71 Chapter 8.9: Changing the screen colors

To change the colors of the screen, choose the item Palette in the Settings menu. A requester will open with gadgets which allow you to change the colors of the palette.

Color: To change one of the colors in the palette, select it, and then adjust the components of the color with the sliding gadgets below.

Red: This gadget changes the red component the selected color.

Green: This gadget changes the green component of the selected color.

Blue: This gadget changes the blue component of the selected color.

Reserved: If the Math and Layout Modes run on the same screen they have to share the same palette. Because the Layout Mode is normally able to change any color of the screen except the first four, you can adjust here how many colors, beginning with the first one, you want it to leave unaltered.

1.72 Chapter 8.10: Changing the task priorities

The program is designed so that its modules run asynchronously, i.e. the Math Mode and the Layout Mode run as separate but parallel tasks. Moreover the axis limits requester also runs as an independent task.

To change the priorities of the tasks, choose the item Priorities
in the Settings menu. A requester opens in which you can change the
priorities of the tasks. You should not give too high a priority to
any task, because it may then block your whole system. A priority
that is too low may lead to the task not getting any CPU time at all.

Math Mode: This slider allows you to adjust the priority of the Math
Mode.

Layout Mode: This slider allows you to adjust the priority of the
Layout Mode.

Math-Requesters: This slider allows you to adjust the priority of
the requesters in the Math Mode.

1.73 Chapter 8.11: Options in the Math Mode

Several adjustments can be done in the Settings menu of the Math Mode.

1.74 Chapter 8.11.1: Use Workbench screen

If the menu item Use Workbench screen is checked, the program opens
its windows on the Workbench screen instead of creating its own screen.

1.75 Chapter 8.11.2: Quick-select

Normally, when you have to select a function, a window or other object out
of a list, this is done in a requester, even if only one function or window
is available for selection. If the item Quick-select is checked, any
time that only one such object is available, it will be selected
automatically, without opening the requester.

1.76 Chapter 8.11.3: Auto active window

If the menu item Auto active window is checked, the program will,
without asking the user, automatically select the active window whenever there
are several windows from which to choose.

1.77 Chapter 8.11.4: Clone Workbench

If the menu item Clone Workbench is checked, the screen mode and the
colors of the Workbench screen are used on the Analay screen.

1.78 Chapter 9: The Layout Mode

The Layout Mode provides all the tools you will need to precisely control
the appearance of the final printed page.

1.79 Chapter 9.1: Concept

To enter the Layout Mode, choose the item Layout in the Program menu.

Because the Layout Mode runs parallel to the Math Mode, you can work
with the Layout Mode while the Math Mode is busy with calculating or vice
versa.

The Layout Mode is organized like most DTP programs. It is true WYSIWYG,
and is box-oriented--all objects are displayed in boxes which can be moved
and stretched freely with the mouse.

In version 1.1 of the program you can only process one page. This page
is displayed in its own window. The window borders contain scroll bars
and arrows, like the Workbench, with which you can change the visible part
of the page. Rulers at the top and to the left show the position on the page,
which is given in centimeters. The Layout Mode is controlled by menus or by
the icon box, which is displayed in its own window. If the item
Toolbox in the Preferences menu is activated, the toolbox is displayd.
Otherwise it is not opened.

All distances are measured in centimeters.

1.80 Chapter 9.2: Changing the page dimensions

To change the dimensions of the page select the item Global page settings
in the Work menu. A requester will open in which you can make your
changes. New page dimensions can be entered by hand in the upper portion.
The lower portion already contains some predefined settings.

Width: Enter the width of the page.

Height: Enter the height of the page.

DinA3, DinA4, DinA5, Standard, Legal, custom: Here you can select from
predefined dimensions. If you have entered other dimensions the
program activates "custom" automatically.

1.81 Chapter 9.3: Changing the magnification

The magnification of the screen display is shown in the third line of the
toolbox. If the width of the whole page on the screen is equal to the
maximum width of the working area, the zoom is 100%.

There are two different ways to change the magnification.

1. Changing the magnification in the requester
2. Changing by mouse

1.82 Changing the magnification in the requester

To change the magnification of the page, choose the item Zoom in the
Preferences menu or click in the field with the zoom display in the
toolbox. A requester opens in which you can change the zoom to any value.

Zoom in %: Here you can change the magnification of the page display
either by typing a value in the string gadget or using the mouse to adjust
the slider.

1.83 Changing by mouse

After selecting the magnifying glass in the toolbox, you can outline an
area on the page which you wish to zoom in on. Move the pointer to one edge
of the area and press the left button. Then drag the pointer to the
opposite edge and release the button. This operation can be aborted
by pressing the right button. The contents of the area which was framed will
be expanded to fit the width of the window, and the height will be adjusted
proportionally to preserve the current aspect ratio.

Remember that this process changes only the screen display, not the page
itself.

1.84 Chapter 9.4: Boxes

All objects in the Layout Mode except lines are displayed in boxes. To move
and size a box, the box mode must be active by selecting the pointer in the
toolbox.
Only one box can be activated at a time, and only the active box can be
changed. A closed border is drawn around the active box.
If the item Show inactive in the Preferences menu is selected,
a border with dotted lines is drawn around inactive boxes.

A box can be moved like an icon on the Workbench. To do so, simply place the
pointer anywhere within it, click, and drag. This operation can be aborted
by pressing the right mouse-button.

The corners and edges of an active box contain small handles with which it can
be re-sized horizontally or vertically (with the edge handles) or both
simultaneously (with the corner handles). This operation can also be aborted
with the right mouse button.

Double-clicking on the box opens the Box settings requester, allowing
you to change the position, size and settings of a box.

Lines are displayed without boxes. The ends of a line can be moved simply by
dragging them with the mouse. The whole line can be moved by picking it up
anywhere along its length.

To delete the active box, choose the item Delete box in the Work-menu
or select the symbol with the crossed-out rectangle in the toolbox.

To change the depth of boxes, select the symbol with the two overlapping
text-boxes in the toolbox. The active box is brought in front of all others.
If the active box is already the top box, it will be moved behind the others.

1.85 Chapter 9.5: Box settings

To change the settings of the active box, choose the item Change active box
in the Work menu. You can change the settings of the box in the opening
requester. All distances must be given in centimeters.

Box coordinates: Here you can enter the position and size of the box.

Left: Enter the position of the left edge of the box.

Top: Enter the position of the top edge of the box.

Width: Enter the width of the box.

Height: Enter the height of the box.

Box parameters: Here you can change the parameters of the box.

Lock box: If this item is activated the box cannot be changed or moved.
This prevents you from changing it inadvertently.

Display box fast: If this item is activated the contents of the box
are not drawn. Diagonal lines will appear instead, which greatly increases the
refreshing of the display.

1.86 Chapter 9.6: Graphics

Graphics can be created by choosing the appropriate menu item in the
Create menu or by selecting the proper gadget in the toolbox.
The following graphic elements can be created:

Rectangles
Ellipses
Lines

1.87 Chapter 9.6.1: Rectangles

To create a rectangle, choose the item Rectangle in the Create menu
or the symbol with the filled rectangle in the toolbox. You then can
create a box with a rectangle by holding the left mouse button while dragging
the pointer from one corner to the diagonally opposite one.

A rectangle initially consists of a border, but may be filled if desired.

1.88 Chapter 9.6.2: Ellipses

To create an ellipse, choose the item Ellipse in the Create menu
or the symbol with the filled ellipse in the toolbox. You then can
generate a box with an ellipse by holding the left mouse button while dragging
the pointer from one corner to the diagonally opposite one.

An ellipse is initially drawn with a line, but may be filled if desired.

1.89 Chapter 9.6.3: Lines

To create a line, choose the item Line in the Create menu or
select the symbol with the line in the toolbox. You then can generate a
line by dragging the pointer from one end to the other.
A line is not displayed in a box. The ends of a line can be moved
with the mouse. The whole line can be moved by picking it up somewhere other
than the ends.
As with a box, you get the Box settings requester with a double-click on
the line.

1.90 Chapter 9.7: Textlines

For the easy creation of textlines, choose the item Textline in the
Create menu or select the gadget with the textline in the toolbox.
The textline requester will open, allowing you to
enter text or change the existing text. After closing the requester with OK,
you can position the textline on the screen with the mouse simply by
moving it to the desired position and pressing the left button. Pressing the
right button aborts the operation.

A box containing a text line cannot be changed in size.
To change an existing textline, activate the box with the textline and
choose the item Change textline~in the Text menu. This opens the
Textline requester, allowing you to make changes to the textline.

1.91 Chapter 9.7.1: The textline requester

The textline requester is for changing the design of the textline.
On the left side the foreground color, the background color and the font
of the textline are displayed. Selecting the A after the corresponding field
brings up a requester in which the colors and the font can be changed.

Textinput: Enter the text of the textline.

Bold: Check this item for bold text.

Italic: Check this item for italic text.

Underlined: If this item is checked the text is underlined.

Transparent: If this item is checked, the text appears directly on
the underlying graphics. If not checked, the text will appear in a rectangle
of the background color selected.

1.92 Chapter 9.8: Textblocks

Apart from simple textlines, you can also create textblocks which
contain longer texts. Textblocks are displayed in boxes. To create a
textblock, choose the item Textbox in the Create menu or
select the symbol with the textbox in the toolbox. Then drag the pointer from
one corner to the opposite one of the area you wish to enclose in the box.

1.93 Chapter 9.8.1: Input of text

To insert text in a textbox, select the gadget with the cursor symbol in the
upper right of the toolbox. Then move the pointer to the desired position in the
textblock and press the left button. You can move the cursor with the
arrow keys or place it again with the mouse. Text can be typed in using
the keyboard as usual. The line-breaking is done automatically. To start
a new paragraph, press the RETURN key.

1.94 Chapter 9.8.2: Marking ranges

To change the text you first have to select a range in the textblock.
Hereto move the mouse to the beginning of the range and press the left
mouse-button. Then move the mouse to the end of the range and release
the mouse-button again. The selected range gets displayed inverted.

1.95 Chapter 9.8.3: Changing the font

To change the font of a text range choose the item Font in the
Text-menu. The Font requester is opened in which you can change
the font.

1.96 Chapter 9.8.4: Changing the text style

The style of the characters of a text range can be changed with the
item Style in the Text menu. To do so, select the
sub-item for the style you wish to apply to the selected text.

The following styles are available:

Bold: Select this item for bold text.

Italic: Select this item for italic text.

Underlined: If this item is selected the text is underlined.

1.97 Chapter 9.8.5: Changing the text color

To change the color of a text range, choose the item
Color in the Text menu. You then can select the color out of a list.

1.98 Chapter 9.8.6: Aligning text

The alignment of selected text can be changed with the item Alignment in
the Text menu by selecting the appropriate sub-item.
The alignment is applied to the entire paragraph containing the selected text,
but paragraphs may be justified separately.
all paragraphs of a text range completely.
The following orientations are available:

Left: The text is left-aligned.

Right: The text is right-aligned.

Middle: The text is centered.

Block: The text is justified left and right.

1.99 Chapter 9.9: Text processing

Currently only one method to process textblocks is available.

9.9.1 Import of ASCII-files

1.100 Chapter 9.9.1: Importing ASCII files

To import an ASCII file, choose the item Import ASCII in the Text menu.
You may then select an ASCII file you want to import from the file requester.
The file is inserted as text at the current cursor position in the active
text-block.

1.101 Chapter 9.10: Formulas

One major feature of the program is its ability to display formulas. This allows you to create complex formulas with powers, fractions, roots and indexes. All formulas must be entered using a special formula format.

1.102 Chapter 9.10.1: Format for the input of formulas

Formulas are entered as strings using a special format, the same one used by the program LaTeX. This format uses special commands to design formulas.

The characters "\" are used to designate a format command. Essential parameters are given in curly brackets "{}". Optional parameters are given in square brackets "[]".
At present the following commands are supported:

^{a}: This will write the letter a as a superscript or exponent.
Note that this command is not preceded by "\".
e.g.: x^{2n}

_{a}: This will write the letter a as an subscript or index.
Note that this command also is not preceded by "\".
e.g.: x_{0}

\frac{a}{b}: Creates a fraction with a as numerator and b as denominator.
e.g.: \frac{1}{x}

\sqrt[n]{a}: Creates an nth root. The a is written under the radical sign. n stands for the degree of the root and is optional.
e.g.: \sqrt{a^{2}+b^{2}}
\sqrt[3]{27}

Commands may also be nested to any level within parameters of other commands.

Parameters consisting of single characters need not necessarily be written in brackets. However optional parameters always have to be written in square brackets.
To link a power and an index to the same character, just append one command to the other, e.g.:

```
x_{0}^{2} or
x_0^2
```

Examples for formulas:

```
\frac{1+x^2}{\sqrt{2+x}}
1+\sqrt{\frac{2x_0^2+3x_1+1}{\sqrt{2}}}
```

1.103 Chapter 9.10.2: Formulas in textlines

Formulas may be typed directly into the text in the Textline requester if
you first switch on the formula mode by typing a "$". It is switched off
again with a second "$". A textline with a such formula could for example
look like this:

Determine the zeros of the function $f(x)=\frac{1}{x}+1$.

1.104 Chapter 9.10.3: Formulas in textblocks

To use formulas in textblocks, choose the item Insert formula in the
Text menu. You may then enter a formula in the String input requester.
In this case, the formula mode is already active. You can switch it on and
off with a "$" as described in the chapter Formulas in textlines.
The formula then gets inserted at the current cursor position. It is
treated like a single character. To change the formula again, select it
with the cursor and choose the item Change formula in the Text menu.
You then can change the formula in the String input requester. You can
delete the formula like an ordinary character in the textblock.

1.105 Chapter 9.11: Taking over windows out of the Math Mode

Each new window in the Math Mode is automatically adopted by the Layout Mode
as a separate box. Every change to the contents of a window in the Math Mode
has an immediate effect on the Layout Mode. However, if a window in the
Math Mode is closed, the corresponding box in the Layout Mode is not
deleted.

In the process of adopting the windows from the screen display of the Math
Mode, the Layout Mode uses previously defined conversions, which you can
change in the Conversion menu.

1.106 Chapter 9.11.1: Color conversion

To change the way in which the colors are converted from Math Mode to
Layout Mode, choose the item Color in the Conversion menu.
A requester opens in which the original and converted colors can be selected.

Math mode color: Select a color of the Math Mode for conversion.

Document color: Here you can select the corresponding document color
into which the color of the Math Mode will be converted.

1.107 Chapter 9.11.2: Line thickness conversion

To change the conversion of the thickness of lines, choose the item
Line thickness in the Conversion menu. The
Line thickness conversion requester opens, letting you change the
conversion of the line thicknesses.

Math mode thickness: Select a line thickness of the Math Mode.

Print thickness: Here you can specify the line thickness in pica points
which the Layout Mode will use for all Math Mode lines of the weight selected.

1.108 Chapter 9.11.3: Font conversion

To change the conversion of the fonts choose the item Font in the
Conversion menu. The font conversion requester opens, letting
you change the conversion of the fonts. You can select a
conversion font in the Layout Mode for every font of the Math Mode. This
is done using conversion elements which are displayed in the left area of
the requester. Every conversion element represents one font of the math Mode
for which you can select a font of the Layout Mode. The right area contains
all fonts available in the Layout Mode. They can be changed using the
Font requester. In this list you can select the conversion font
for the current conversion element. The element "rest" stands for all other
fonts of the Math Mode which do not have their own conversion elements. In
the string gadget below the Math Mode list, you enter the name of the font
of the current conversion element. This name has to be the name of the font
in the Math Mode, e.g. topaz.font.

In the lower region, you may specify how all font sizes in the Math Mode
will be converted by the Layout Mode. Enter a Math Mode size in pixels and the
corresponding size in Pica points for the Layout Mode. All other sizes
will be scaled using the same ratio.

New font: A new conversion element is created and appended to the list
of Math Mode-fonts.

Delete Font: Deletes the selected conversion element.

Math Mode size: Enter the size of a font in the Math Mode.

Layout Mode size: Here you can give the corresponding size in
Pica points. All other Math Mode fonts will be resized
with the same ratio.

1.109 Chapter 9.11.4: Axis system conversion

To control the conversion of axes, choose the item Axis system in the
Conversion menu. This will open the axis system conversion requester.

Font: The font used for the axis labels is displayed.
Selecting the A after the field brings up the Font requester.

Color: The color of the axes and the axis labels is displayed.
Selecting the A after the field lets you choose a new color.

Line thickness: Here you can specify the thickness of the axes in
Pica points.

Default: If this item behind a particular field is activated, the
corresponding default conversion is used to draw the systems of axes.
Note that all systems of axes will have for example the same font in the
Layout Mode if you deactivate the item "Default" with the font conversion,
even if they have different fonts in the Math Mode.

1.110 Chapter 9.11.5: Grid conversion

To change the conversion of grids, choose the item Grid in the
Conversion menu. The grid conversion requester will open.

Color: The color of the grid is displayed here. By selecting
the A after the field you can select a new color.

Line thickness: Here you can adjust the thickness of the grid lines
in Pica points.

Default: If this item after a particular item is activated, the
corresponding default conversion is used to draw the grid. Note that all
grids will for example have the same color in the Layout Mode if you
deactivate this item with the color conversion, even if the grids have
different colors in the Math Mode.

1.111 Chapter 9.12: Changing the contents of boxes

To change the contents of the active box choose the item
Change box contents in the Work menu. The requester which
opens will allow different settings according to the selected box.

Changing boxes containing graphics
Changing the contents of math boxes

1.112 Changing boxes containing graphics

If the active box contains graphics, the following settings can be changed:

Outline color: The outline color of the object is displayed.
Selecting the A after the field lets you choose a new color.

Fill color: This section shows the color with which the object
is filled. Selecting the A after the field lets you select a
new color. This item is only applicable if the item Fill is
activated.

This option is not displayed with lines.

Line thickness: Here you can adjust the thickness of the outline
in Pica points.

Fill: If this item is activated, the graphic object is filled
with the selected color. Otherwise the object is transparent.

This option is not displayed with lines.

1.113 Changing the contents of math boxes

If the active box contains a window of the Math Mode, the following settings
can be done:

Font: In this field the font for all texts of the window apart from the
axis labels is displayed. Selecting the A after the field lets you
choose a new font from the Font requester.

Text color: This field displays the color to be applied to texts in the box.
Selecting the A after the field lets you choose a new color. In addition to
the normal texts in a table, the following objects are seen as
texts:

    Texts
    Points
    Markers

Graphic color: In this field the color for all graphics in the box is
displayed. Selecting the A behind the field lets you choose a new color.

The following objects of a window are seen as graphics:

    With function windows:

        Hatchings

    With lists and tables:

        Separation lines

Axis system: By selecting this gadget, you can change the system of
coordinate axes of the box. This is done using the
Axis system conversion requester.

This item is only displayed with function windows.

Grid: By selecting this gadget you can change the grid in the box.
It opens the Grid conversion requester.

This item is only displayed with function windows.

Default: If this item after a particular field is selected, the corresponding default conversion is used to display the box's contents. Note that if, for example, you switch off the default conversion for the fonts, all texts of the window in the Layout Mode are displayed with the same font selected in this requester. If you switch on the default conversion, you can specify the font for each text in the Font conversion requester.

1.114 Chapter 9.13: Adapting the size of function boxes

To get a printout of systems of axes true to scale you can scale the box either by hand or let it be scaled by the program automatically. A graph may be scaled manually or automatically, according to specifications you enter. To let Analay do the scaling, choose the item Adapt box size in the Work menu. A requester opens in which you can specify the correspondence between x- and y-units of the graph and centimeters on the printed page.

1.115 Chapter 9.14: Changing the document colors

To change the colors of the document, choose the item Document colors in the Preferences menu. The document color requester opens, letting you adjust the colors of the document. The list on the right shows all the entered colors. You can change the currently selected color on the left side. With Amiga OS 3.0 and later, the left side contains a color wheel with a gradient slider with which you can change the current color. Beneath this, there are three RGB sliders which enable you to change the red, green, and blue components of the current color.

New color: A new color is appended to the list of colors.

Delete color: The current color is deleted from the list.

1.116 Chapter 9.15: Changing the screen grid

A grid can be displayed on the working area. If desired, all positions and sizes of boxes on the screen snap to the grid, so that you can place them exactly. To change the grid choose the item Grid in the Preferences menu. The grid requester opens, letting you make changes in the grid.

Display grid: If this item is activated the grid is displayed.

Snap: If this item is activated all screen operations using the mouse will snap to the grid.

x: Enter the horizontal distance (cm.) between grid points.

y: Enter the vertical distance (cm.) between grid points.

1.117 Chapter 9.16: Changing the fonts

The program can handle both bitmap and Compugraphic-Intellifont® fonts.
To specify fonts and their paths, choose the item Fonts
in the Preferences menu. A requester will open in which you can
enter names of fonts and their paths. On the left side, all currently
entered fonts are listed. To the right, all paths are listed. You can
specify a path for every font. Note that you can only select one path for
each font! You can change the current font and the current path in the
string gadgets below the listviews.

New font: This gadget lets you add to the list of selectable
fonts.

Delete font: The selected font will be removed from the list.

Sort fonts: The list of fonts will be sorted alphabetically.

New path: Lets you add a new path to the list.

Delete path: The current path will be deleted from the list.

1.118 Chapter 9.17: Changing the screen presentation

Because the bullet.library is not supported directly when using
Intellifonts®, all Intellifonts® are currently loaded using the
diskfont.library. However this library only offers the fonts in a
square resolution. If the screen resolution is not square, additional
scaling of the fonts must be done by the program, which requires time.

Text display can be sped up very much if you are willing to accept a
small distortion on the screen. To adjust the maximum distortion, choose the
item Screen presentation in the Preferences menu. In the
requester which opens, you can adjust the maximum permissible distortion
as a percent. Please note that the whole page will be displayed distorted, so
that you won’t notice the distortion up to a certain degree!

1.119 Square resolution

With a square resolution every pixel on the screen is square. However,
with many resolutions the pixels are not squares, but rectangles.

The program assumes a width/height ratio of 4:3 on the monitor.

1.120 Chapter 9.18: Printing the document

To print the document, choose the item Print in the Program menu.
The Print requester will open, allowing you to change the settings.
Afterwards a window opens in which you can follow the progress of printing by watching the bar.

Printing is done through the printer driver set in the Workbench preferences.

Do not do any work in the Math Mode that would change windows as they are being printed. If you do, the changes will be taken over to the printout immediately, and may have unexpected results. However, you may close a window, since this does not affect the Layout Mode. You also may do analysis of functions in these windows. New windows may also be created at any time.
(see also chapter Known program-bugs)

1.121 Chapter 9.18.1: The print requester

In this requester you can control several aspects of printout.

Driver: The current printer driver is displayed. It can be changed by using the Printer program in the Preferences drawer.

Resolution: Here you can change the printing resolution. To the left of the slider, the resolution is displayed in dpi. Higher resolutions will increase the time required for printing.

Draft, High quality Select the print quality you desire.

Landscape, Portrait: Here you can select whether the page is printed horizontally or vertically. If you print the page in landscape format be sure the long dimension appears as "width" in the page format requester.

Black & White, Grayscale, Color: Here you can select whether the document will be printed in black & white, in grayscale or in color. A black & white printout is fastest.

Printing on ECS computers uses a maximum of 32 colors or 16 gray levels. Using a AA machine, up to 256 colors or 256 gray levels are possible.

Grayscale rastering: Here you can adjust the shading of gray levels.

Number of graysteps: Here you can adjust the number of graysteps used with a grayscale printout. The more gray steps you use, the longer the printing will take. Too many graysteps are not practical in many cases, because so many printers are unable to display them properly. The printout will just be slowed down unnecessarily.

Color correction: This gadget lets you turn the color correction for color printing on or off.

1.122 Chapter 9.19: Options in the Layout Mode

In the Layout Mode you can control several processes in the Preferences menu.

1.123 Chapter 9.19.1: Show inactive

If the item Show inactive is checked, a border with dotted lines is drawn around every inactive box. See also the chapter Boxes.

1.124 Chapter 9.19.2: Toolbox

If the item Toolbox is checked, the toolbox is displayed. See also the chapter Concept.

1.125 Chapter 9.19.3: Custom screen

If the item Custom screen is activated, the Layout Mode uses a separate screen instead of the Math Mode's screen.

1.126 Chapter 9.20: Changing the screen resolution

To change the resolution of the Layout screen, choose the item Resolution in the Preferences menu. This only works if the Layout Mode is running on a custom screen. The selection of the screen mode is done as described in the chapter Changing the screen resolution in the Math Mode section.

1.127 Chapter 9.21: Changing the palette

To change the colors of the Layout screen, choose the item Palette in the Preferences menu. This only works if the Layout Mode is running on a custom screen. The adjustment of the colors is done as described in the chapter Changing the palette in the Math Mode section.

1.128 The font requester

This requester lets you choose a font. In the left section, all available fonts are listed. The right section contains all currently available sizes of the current font. To generate a new size, simply enter it in the string gadget below the list of sizes.

1.129 Chapter 10: File operations

If an already existing file is to be overwritten by the program, the old
file will first be saved with the appendix .bak in the same directory.
If your machine then crashes while saving, you can find the old file
with the appendix .bak in the same directory.

The following chapters contain some information about the saved objects.

9.1 Preferences
9.2 Documents

1.130 Chapter 10.1: Preferences

Many of your preferences for Analay can be saved so that they are in effect
each time you start the program.

Preferences are:

- positions and sizes of requesters
- screen resolutions
- palettes
- task priorities

Specifically in the Math Mode:

- internal constants
- default styles for objects: texts, points, markers, hatchings, legends, lists, tables
- pattern list (of points and markers)

Specifically in the Layout Mode:

- Layout active/inactive
- toolbox active/inactive
- position and size of the Layout window
- position of the toolbox
- show inactive
- custom screen
- zoom
- grid
- document colors
- fonts
- maximum distortion
- conversion settings
- page dimensions
- printer settings

To save the preferences, choose the item Save in the Settings menu.
The preferences will be saved in the directory Analay: under the name
Analay.config. When the program is started, it searches for this file in the
directory Analay: or in the current directory. If found, it is loaded
automatically.

To save the preferences under another name, choose the item Save as in the
Settings menu. You then can enter a separate file name for each
configuration you want to save.

To load the preferences from a file, choose the item Load in the
Settings menu. The requester lets you select the configuration you
want to use at the time.

1.131 Chapter 10.2: Documents

To save the current document, choose the item Save as in the Program menu.
You then can select a file name in the requester or enter a new one.

To load a saved document, choose the item Load in the Program menu.
You then can select a file to be loaded from the list presented by the file
requester.

To save the current document under the name under which it was previously loaded
or saved, choose the item Save in the Program menu.

The following data are saved with each document:

    All data created and entered.

Specifically in the Math Mode:

    constants
    pattern lists (of points and markers)

Specifically in the Layout Mode:

    page dimensions
    zoom
    grid
    document colors
    fonts
    conversion settings
    maximum distortion
    printer settings

1.132 Chapter 11: About the program

The program was written using the Amiga-Oberon compiler by Fridtjof Siebert.
It uses the garbage collector of this Oberon system, which makes it
much larger than programs not using the garbage collector. However
it runs very fast and, using the garbage collector, very stably.

Bug reports and suggestions for improvement are always welcome!
Please send them to the address given in the chapter How to order.

Thanks go to (in alphabetical order):

Mr. Nagel
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Ralf Rothfuß

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Mrs. Groß (who has an answer to every mathematical question)
Boris Jakubaschk (my major beta-tester and major information source)
David Thomson (who revised the English program texts and co-edited the English documentation)

Program history:

Beginning 1991 : Start of the development of SuperCalc

Middle 1991, V0.1 : First version, only for one tester. Not yet very great.

Middle 1993, V0.5 : First good version, now completely re-programmed in Oberon.

Spring 1994, V0.8 : Implemented Layout Mode

Summer 1994, V0.9 : New test version

October 1994, V0.95 : Beta version of the published V1.0
New name: Analay

November 2, 1994, V1.0 : First published version, unfortunately German only

January 4, 1995, V1.1i : Beta version

- Language-independent. Supported languages:
  Program texts: German, English
  Documentation: German, English

- Zoom up to 500 1n the Layout Mode possible

February 27, 1995, V1.1: Published version

1.133 Chapter 12: Known program bugs

The following bugs are known, but do not disturb the function of the program substantially. They'll probably be removed in a future version.

1.) Not all input is checked for correctness. The program should not crash when entering an incorrect function term or number value, but it may give incorrect results.

2.) Analay MAY calculate incorrectly with numbers that are too small or too large, i.e. outside the range 10E-8 to 10E+8. Large numbers might lead to an overflow, small numbers might be below the accuracy of the program's calculations. This should not affect normal functions.

    If you want to use larger or smaller numbers, just try them, but check the results.

3.) While printing a page in the Layout Mode, you may not change any of the windows in the Math Mode which are being printed. They may be closed and you also may analyze the functions displayed in these windows.
    Also, functions being printed at the moment may not be changed. If this happens, it will affect output to the printer with unpredictable results.
    New windows may be created at any time.
    (see also chapter Printing the document)

4.) The program is not font sensitive! The use of fonts that are too large may lead to an incorrect screen display. It works properly up to a size of 12 pixels.

5.) It often occurs that the Layout Mode stops drawing when building up a page. When this happens, the Layout Mode is waiting for the Math Mode to finish plotting a window. As soon as the Math Mode has finished plotting the window, the Layout Mode continues.

    If the Layout Mode pauses without an obvious reason and seems to hang during the page layout, try resizing each window in the Math Mode so that they get redrawn. The Layout Mode then should continue with the layout. This also can happen during printing. Because this error only occurs very rarely, it is very difficult to trace it. In fact, I may have already fixed it!

6.) The derivative of function terms containing the abs function is not generated correctly at the moment. Therefore it is also not possible to determine the points of inflection of an abs function.

1.134 Chapter 13: Future prospects

The following features and changes are planned for future versions:

- font-sensitive user interface
- completely asynchronous program design
- polar coordinates
- 3D graphs
- further simplification of function terms

- new concept for carrying windows over into the Layout Mode
- multiple-page documents
- direct support of the bullet.library
- better editing functions in the Layout Mode

1.135 WYSIWYG

WYSIWYG = What You See Is What You Get

You can see your page on the screen as it will appear in the printout.

1.136 Pica point

1 point = 1/72 Inch

1.137 Inch

1 inch = 2.54 cm

1.138 Index

Lists

M

N

O

P

Q

R

S

This index was created using AGIndex by Camiel Rouweler.