

KFracPlus_Documentation

COLLABORATORS

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WRITTEN BY		July 29, 2024	

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Chapter 1

KFracPlus_Documentation

1.1 KFracPlus Documentation :

KFracPlus V4.1

- FREWARE -

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This program was written under OS V3.00 and is therefore fully compatible. It needs OS V2.04+

This program needs :

- the 'superview.library' V2+ (in "LIBS:")
- the 'iffparse.library' V37+ (in "LIBS:")
- the 'asl.library' V37+ (in "LIBS:")
- the 'mathieeedoubbas.library' V37+ (in "LIBS:")
- the 'mathieeedoubtrans.library' V37+ (in "LIBS:").

Full AGA-Support via Screen-Mode-Requester.

Release Date : 27.06.1994

Copyright
Disclaimer
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1.2 copyright

The program KFracPlus V4.1 and its documentation files are
(C)opyright 1991-94 by Andreas R. Kleinert. All rights reserved.

1.3 disclaimer

The author takes no responsibility for any results of the use of this program.

This software is provided "AS IS" and there is no warranty of any kind, so that you use this software at your own risk.

1.4 distribution

The program KFractPlus V4.1 is freely distributable (FREeware). You may copy it, if the copyright notice is left intact and all of its parts are included in the distribution. This program must not be included in commercial packages or commercial program collections without my written permission. This program must not be sold in any way, but it is allowed to take a nominal fee including the costs for copying.

This program may be put on public domain disks or included in public domain disk libraries.

Special permission hereby goes to Fred Fish's AmigaLib-Disks and the german series (in alphabetical order) :
AmigaSzene, BerndSPD, FRANZ, GPD, SaarAG, TAIFUN and TIME.

This program may also be distributed via electronic mail and may be put into mailboxes as long as the redistribution conditions are respected in all points.

By using or distributing this program you automatically agree to all of the above conditions and terms.

1.5 function

Up to this version you have the possibility to generate the following types of fractals :

- 1) Feigenbaum
- 2) Julia-Sets
- 3) Mandelbrot-Sets ("Apfelmännchen")

Usage :
=====

Julia-Set :

'ze_re' and 'ze_im' determine, which part of the fractal, which results out of the 'c_re' and the 'c_im' value, is shown.

'ze_re' influences the X-Coordinates, 'ze_im' the Y-Coordinates. The 'Iteration' value determines the depth - the 'clearness' - of the picture, and the 'width' and 'height' are responsible

for the size of the picture.
Speed may be increased by selecting less colors, a smaller size
or less 'Iterations'.

Mandelbrot-Set :

'c_re' and 'c_im' determine, which part of the fractal,
which is always similarly, is shown.
'c_re' influences the X-Coordinates, 'c_im' the Y-Coordinates.

The Rest is the same as with the Julia-Set.

Feigenbaum :

This implementation does not seem to be fully bug-free, but with
the default-values it works !

Tooltypes and File-Keywords :

=====

Tooltypes "neutralize" File-Keywords.

SCREEN_MODE=<0x.....>	Mode-ID (Hex-Number like in "C")
SCREEN_WIDTH=<Screen-Width>	(depending on Screen-Mode)
SCREEN_HEIGHT=<Screen-Height>	(depending on Screen-Mode)
SCREEN_DEPTH=<Screen-Depth>	Colordepth of the Screens
WINDOW_WIDTH=<Window-Width>	Width and Height of the Display-
WINDOW_HEIGHT=<Window-Height>	Window on the Screen
FEIGENBAUM_KMIN=<Double-Number>	(described above)
FEIGENBAUM_KMAX=<Double-Number>	
FEIGENBAUM_Q0=<Double-Number>	
FEIGENBAUM_VALS=<Integer-Number>	
FEIGENBAUM_SKIP=<Integer-Number>	
MANDELBROT_C_REMIN=<Double-Number>	(described above)
MANDELBROT_C_REMAX=<Double-Number>	
MANDELBROT_C_IMMIN=<Double-Number>	
MANDELBROT_C_IMMAX=<Double-Number>	
MANDELBROT_STEPWIDTH=<Integer-Number>	
JULIA_Z_REMIN=<Double-Number>	(described above)
JULIA_Z_REMAX=<Double-Number>	
JULIA_Z_IMMIN=<Double-Number>	
JULIA_Z_IMMAX=<Double-Number>	
JULIA_C_RE=<Double-Number>	
JULIA_C_IM=<Double-Number>	
JULIA_STEPWIDTH=<Integer-Number>	
SELECTED=<FEIGENBAUM MANDELBROT JULIA>	selected Fraktal-Type

Construction :
=====

The graphical surface of this program has been created under use of the famous program "GadToolsBox V2.0c", which is written and © by Jan van den Baard.

KFracPlus makes use of :

- the 'superview.library' V2+ (FREEWARE, by me)
- the 'iffparse.library' V37+ (Workbench V2.04+)
- the 'asl.library' V37+ (Workbench V2.04+)
- the 'mathieeedoubbas.library' V37+ (Workbench V2.04+)
- the 'mathieeedoubtrans.library' V37+ (Workbench V2.04+)

The first versions of KFractPlus have been written between July 1991 and April 1992.

Those versions were still called only "KFract" - without this "Plus". They were partially developed during a 'project week' at the G.A.L. (Gymnasium am Löhrtor) in Siegen. Thanks to all, who gave me the knowledge to write the first version of this program and to fix its (many) bugs !!!

Explicitely thanks go to Mr. Schnell, Steffen Dingel and René Koch, who organized our project about 'chaos : fractals and their meanings' !

Background :
=====

About the Mandelbrot- and Julia-Set :

Mandelbrot and Julia are both some ways of a partially display of an object, which depends on 4 parameters.

Mandelbrot uses fix 'z_re' and 'z_im' and displays the fractal as a graphic, where the x- and y-position depend from 'c_re' and 'c_im'.

Julia uses fix 'c_re' and 'c_im' and displays the fractal as a graphic, where the x- and y-position depend from 'z_re' and 'z_im'.

Both use the same (recursive) algorithm, which looks as follows :

$$z_{n+1} = z_{new} = z_n^2 - c$$

This is transferred to a 'complex platform', where z_n and c are complex (imaginary) numbers :

$$\begin{aligned} z_{re_new} &= z_{re}^2 - z_{im}^2 - c_{re} && \text{(new real part for iteration)} \\ z_{im_new} &= 2 * z_{re} * z_{im} - c_{im} && \text{(new imaginary part for iteration)} \end{aligned}$$

With this formula it is possible to describe the behaviour of

the above recursive algorithm in a 2-dimensional way, where 'convergency' and 'divergency' (don't know if these are the right words) are represented and marked with different colors (each pixel).

1.6 correspondence

If you like, you may send me some money. Perhaps this will motivate me to continue programming such programs or just making updates of this one. Send bug-reports, money or whatever to :

Andreas R. Kleinert,
Grube Hohe Grethe 23,
D-57074 Siegen,
Germany. email : ...

1.7 systeminformation

KFracPlus was programmed on an Amiga 4000 with 68030EC (25Mhz), 4 MB, 85/260 MB IDE/AT-HD and OS 3.00 under SAS/C V6.51.

1.8 history

V4.2 : (27.06.1994, original-size : 51824 Bytes
----- and (68030-Version) : 51548 Bytes)

- Sorry, there was some busy-waiting. Fixed.
- fixed a possible bug-source (odd-address error)

V4.1 : (19.06.1994, original-size : 51764 Bytes
----- and (68030-Version) : 51488 Bytes)

- use of SAS/C V6.51
- GUI is now font-sensitive and uses the default PublicScreen
- Documentation now as AmigaGuide-File
- added AmigaGuide-Online-Help (HELP key)
- added ESC-key support to many windows
- ak_gen0.library no longer needed :
created own ScreenMode-Requester replacement for V37
(gadtools-Gadgets, font-sensitive)
- and many more little changes

V4.00 : (30.04.1994, original-size : 43980 Bytes
----- and (68030-Version) : 43768 Bytes)

- use of SAS/C V6.5
-

- removed 68020-Version (compatible with 68030 version)
- improved drawing speed by using WritePixelLine8()
- using utility.library (SAS/C's UTILLIB option)
- graphics now can be saved in all formats of the superview.library
- and many more improvements

V3.50 : (31.10.1993, original-size : 43276 Bytes
 ----- and (68020-Version) : 43132 Bytes
 and (68030-Version) : 43132 Bytes)

- optimized Mandelbrot-Calculation (big/small radius)
- bug-fixes in the Zoom-Routines
- changed Screen (Interleaved (V39+), Showtitle, ...) and Window (Backdrop, Borderless, ...) Flags
- Icon-Graphics was not always in Chip-Memory
- added UNDERSCOREs for all GadTools-Gadgets
- now with special "68030+"-Version
- at least 'ak_gen0.library' V38+, as already used in the last version

V3.20 : (10.10.1993, original-size : 40956 Bytes
 ----- and (68020-Version) : 40820 Bytes)

- use of SAS/C V6.3
- use of "superview.library" V1+ for writing of Pictures
- use of "iffparse.library" for ColorMap-Reading
- new Message-Requester function (V33/V37)
- own Installer-Script

V3.05 : (25.07.1993, original-size : 42248 Bytes
 ----- and (68020-Version) : 42088 Bytes)

- use of GadToolsBox V2.0c
 - bug-fixes
 - new color-set for the higher 16 colors of the internal 32-Color-Table
 - IFF-Code slightly improved
 - Color-Table is now read from external File (IFF-ILBM-File with BHMD- and CMAP-Chunk(s), no color limit), if available :
1. Attempt : "ENV:KFracPlus.cmap"
 2. Attempt : "S:KFracPlus.cmap"
 3. Attempt : ":KFracPlus/KFracPlus.cmap"
 4. Attempt : "KFracPlus.cmap"
 5. : [internal Default-Colors, max. 32]

V3.04 : (20.06.1993, original-size : 41372 Bytes
 ----- and (68020-Version) : 41224 Bytes)

- "crash-bug" fixed
- remembering values when switching fractal-type

- Load-/Save-Option
- more failure-checks and error-requester
- Window is now cleared before Feigenbaum-Zoom
- Icon is written (Default-Tool depending on program version)
- Tooltype-Support

V3.03 : (April 1993, original-size : 26884 Bytes
----- and (68020-Version) : 26712 Bytes)

- now with special "68020+"-Version

V3.02 : (March 1993, original size : 26884 Bytes)

- use of SAS/C V6.00
- another fix of the OS V3.0-IDCMP_CLOSEWINDOW-gadtools.library-Bug (use "==" instead of "&" to check this bit !)
- changes to the doc-file
- use of "ak_gen0.library" V37+ and of its new ScreenMode-Requester, so that now ALL available ScreenModes (Std., ECS, AA) are useable
- made use of some global optimizations (calcing- and IFF-ILBM routines)

V3.01 : (March 1993, original size : 28716 Bytes)

- fixed bug in Screen-Requester :
forgot to convert "depth" into "number of colors"
- new Icon
- WB-Console-Window will be closed.
Side effect : If no Intuition-based error-report is possible, you'll get none (because no CLI available).
- now checking legality of values for window-width and -height
- there was a small bug in the setting-routine for the ColorDepth-Slider-Gadget. Under OS V2.04 there only occurred wrong values, but under OS V3.0 the whole surface disappeared !
This bug is now hopefully fixed !!!
- now runs as a Background-Task (using "cback.o")

V3.00 : (February 1993)

- complete redesign of surface in general :
 - new Start-Panel, from which all other areas (Settings, Actions) can be reached
 - new OnLine-Panel
 - and more
 - separate Screens for Interaction and Drawing
 - ScreenMode-Requester, which allows to select between the following modes (non- and interlaced) :
-

- Lores (max. 32 Colors)
- Hires (max. 16 Colors)
- Superhires (max. 4 Colors)
- Productivity (max. 4 Colors)
- VGA-Lores (max. 4 Colors)
- VGA-ExtraLores (max. 4 Colors)
- A2024 (max. 4 Colors)

There may be more modes supported in the future.

- removed CCRT and CRNG things in IFF-Support (neither necessary nor useful there)
- more intensive use of "V37+"-Functions
- Last not least : "ak_gen0.library" V36+
(with new FileRequester abilities and less bugs ...)
- and more ... !!!

V2.01 :

- Interlace did not work. Now it does.
- Last not least : "ak_gen0.library" V35.106+.

V2.00 :

- now under use of Jan van den Baard's famous program

"GadToolsBox" (V1.4)

and therefore only runnable under OS V2.04+

- Fixed some bad garbage in Mandelbrot-routine (divergency-test)
- IFF-Support-routine now is more general (internal thing)
- removed stupid "symmetry" things of former versions (Julia, Mandelbrot)
- lowest accepted version of "ak_gen0.library" now is V35+
- cleared DocFile
- removed "Quadranian"
- make use of some special OS V2.04-stuff

V1.12 :

- This version is no longer PUBLIC DOMAIN, but FREeware
- now its possible to save the Fractals as IFF-ILBM-Graphics
(uncompressed and compressed, as you like)
- some small speed improvements (Yeeeeaaaahh !!! :)
- added some Menus (to the Display-Screen), so that Intuition
now is supported much more better
- fixed some things in the docs (this one you are reading now) and
in the program-internal docs
- this release makes use of "ak_gen0.library" V35.21
(V34.xx still supported)

V1.10 :

- improved and "debugged" the documentation in- and outside the program
- integrated three new types of fractals :
 - Mandelbrot (also called "Apfelmaennchen")
 - Feigenbaum (hope, it functions correctly)
 - Quadranian (it bases on rectangles, and produces a strange kind of pattern -> not one of the 'usual' fractals)
- improved some less important things

V1.02 :

- improved speed of main algorithmus
- making use of pragmas
- making use of special code optimizations
- some other small enhancements
- now the number of colors used is changeable (2, 4, 8, 16)

V1.01 :

- modified for use with "ak_gen0.library" (instead of "ak.library")
- now support of double precision instead of single precision

V1.00 :

- initial release

pre V1.00 :

- unreleased work versions
(constructed mainly during a 'project week')

1.9 morecopyrights

Some of the mentioned names or products above may be copyrighted by companies or trademarks of companies.

More Copyrights :

- "GadToolsBox" V2.0c is GIFTWARE and
© 1991-1993 by Jan van den Baard.