Default

COLLABORATORS

	TITLE : Default		
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REVISION HISTORY

NUMBER	DATE	DESCRIPTION	NAME

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Chapter 1

Default

1.1 Benoit documentation

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      Benoit - a fractal image renderer for Amiga computers

      (c) Copyright 1997, 1998 by phase5 digital products

      Written by André Osterhues
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1.2 Introduction

```
Introduction
============

Benoit is a fractal image renderer. It is able to calculate several types of
fractal images, including the well-known Mandelbrot set and Julia sets.
Furthermore, using Benoit’s formula editor, one can easily explore other types
of fractal images.

Benoit renders in 8bit or 24bit. It uses CyberGraphX for display.

Furthermore, Benoit fully supports phase5’s PowerUP cards. It auto-detects the
PowerPC processor and lets the user decide whether to use it or not. If a PPC
is not present, Benoit switches back to M68k mode.
```

1.3 Features

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Features
========

- True color rendering on 15/16/24bit Screens, calculations are done in 24bit
- 256 color rendering on 8bit Screens
- Can be opened on any 8/15/16/24bit PubScreen
- Sizable window
- Auto-sensing of PowerUP cards
- CPU switchable (M68k / PPC)
- Six different fractal types provided
- Unlimited number of fractal types using the flexible formula editor
- Dual color system (even color / odd color)
- Three button mouse supprt
- Cursor key support
- Coordinates can be loaded from and saved to disk
- Many coord files provided
- Images can be saved as IFF files
```

1.4 Requirements

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Requirements
============

To run Benoit you need:
- an Amiga
- a 68020/030/040/060 processor
- some kind of FPU (68881/2 or 68040/060)
- CyberGraphX V2.0 or greater
- Kick 3.0 or greater (might run on Kick 2.0 - not tested)
```

1.5 Installation

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Installation
============

Just copy the file Benoit anywhere you like. If you want to use the PowerUP
features, copy the file Benoit.elf into the same directory as Benoit (Benoit
tries to load PROGDIR:Benoit.elf).
Copy the coordinate files directory into the same directory as Benoit (Benoit
loads from PROGDIR:Coords as default).

Make sure that you have the following libraries in your LIBS: path:
- asl.library v38+
- cybergraphics.library v40+ (or cgxsystem.library, as that one creates
  cybergraphics.library)
- gadtools.library v38+ (should be in the ROM)
- gtlayout.library v38+
- ppc.library v44+ (only if you have a PowerUP card installed)
```

1.6 Usage

```
Usage
=====

To start, simply click the icon or start it by typing Benoit in your shell.
Benoit has the following options:

WIDTH         the initial width of the display window

HEIGHT        the initial height of the display window

SCREEN        use an ASL screenmode requester to choose a screen to open
              Benoit on

PUBSCREEN     name of a public screen Benoit should be opened on
```

1.7 The User Interface

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The User Interface
==================

When started without arguments, Benoit opens its windows on the Workbench screen ↩
   ,
using the default Workbench resolution.
If using an 8bit Workbench (or an 8bit PubScreen), it tries to obtain 253 pens.
On most systems, not all pens can be obtained in that precision, so expect a
slightly worse picture quality. This does not affect the IFF saver!

Two windows should be opened then, a display window and a user interface window.
In the user interface window, the following elements should pop up:

CPU
---
The CPU to be used. Currently supported are M68k and PPC :^)

Fractal type
------------
The fractal type to be calculated. This directly corresponds to the Formula and
Style settings. Currently supported:
- Mandelbrot    the well-known Mandelbrot set
- Julia         the well known Julia sets
- Dragon        \
- Salamander     \ some less knwon fractals, each
- Meteors        / having different characterisms
- Pearls        /
- Formula       a user-defined formula

Formula
-------
The rendering formula. It shows the formula when using one of the predefined
fractal types. If you edit the formula, fractal type is changed automatically to
Formula. See below for details on how an expression has to look like.
```

```
Style
-----
This sets one of the two possible styles: Mandelbrot or Julia.
- Mandelbrot means that c is set according to the current position in the
  window. x seed and y seed are ignored.
- Julia means that c is set to the value specified in x seed and y seed. Set
  these variables to a value other than 0.0 if you want to see more than a
  filled black circle.

Exponent
--------
This corresponds to the "n" value in some of the formulas. It is currently
restricted to the range from 2 to 16. Though normally used as the exponent in
the formulas, it might be used as a multiplier as well.

Max iter
--------
The maximal number of iterations, which is proportional to the calculation time.
So don’t exaggerate :o)

Even color
----------
Color offset for the even iterations (0, 2, 4, 6, ...).
0 = red         1 = yellow      2 = green
3 = cyan        4 = blue        5 = purple

Odd color
---------
Color offset for the odd iterations (1, 3, 5, 7, ...).

Color repeat
------------
This value defines the number of colors. Normally, this should be the same as
Max iter. But as Max iter increases, the color difference between two iteration
levels decreases. When it gets too smooth, the user might want to adjust it by
setting this value to somewhat lower than Max iter.

Coordinates (right side of the GUI)
-----------
The point given by (xmin, ymin) specifies the top left point of the image, the
point given by (xmax, ymax) specifies the bottom right one. If values are
exchanged (for example, if xmax < xmin), they are corrected automatically.
Note that x always corresponds to the real part of the complex number while y
always corresponds to the imaginary part.

Calculate
---------
Start the fun!

Load coords
-----------
Load a coordinate file from disk. The default path is PROGDIR:Coords. Note that
coordinate file names should always end with .coords.

Save coords
-----------
Save the current coordinates to disk. All values except for CPU type and window
```

```
size are stored.

Save as IFF
-----------
Save the current image to an IFF file. If the resolution is 8bit, a 256 color
IFF file is written, if resolution is 24bit, an IFF24 file is written.

Reset
-----
Resets x min, y min, x max and y max to their default values. Note that x seed
and y seed don't get touched.

Quit
----
Just quit, no requesters.
```

1.8 Window control

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Window control
==============

Mouse control:
- Use the left mouse button to zoom in
- Use the right mouse button to zoom out
- Use the middle mouse button to pick x seed and y seed

Key control:
- Use the cursor keys to move
  (Note: not optimized, the image is completely recalculated)
- Use '.' to zoom in
- Use ',' to zoom out
- Use 'q' to quit
```

1.9 The Formula Editor

```
The Formula Editor
==================

Each expression has to look like this:

(a#b)

where a and b are expressions or variables and # is an arithmetic operator.

Operators provided:
-------------------
+, -, *, /, ^

Variables provided:
-------------------
z       the complex number z (iterator)
c       the complex number c (constant)
```

```
i       the imaginary constant i
n       the natural number n (taken from Exponent)
x       the real part of z
y       the imaginary part of z
a       the real part of c
b       the imaginary part of c
        any positive number, real or natural

negative numbers have to be created by subtracting from 0.0:
(0.0-1.0)

Examples
--------
Ok:
(a+b)
(a+(b+c))
((a+b)+c)
((z^2)+c)
(5*(z+2))

Wrong:
a+b             no parenthesis
(a)             variables must not be in parenthesis
(((a+b))        missing parenthesis
```

1.10 History

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History
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06.08.1998    V2.6    - Run-length encoder in the IFF saver now checks for
                        too long run length (caused errors with wide IFFs)
                      - Requesters now keep their properties
                      - IFF files written by Benoit can be loaded in again
                        using "Load coords"

09.01.1998    V2.3    - CTRL-C support

09.12.1997    V2.0    - IFF saver implemented
                      - 8bit support implemented
                      - some minor bugfiexs

20.08.1997    V1.9    official release
```

1.11 Thanks

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Thanks to
=========

- Frank Mariak, for so much invaluable advice

- Robert Reiswig, for the CyberGraphX, Benoit, Isis, Osiris support pages
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```
    and for the installer script
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1.12 Author

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Author
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Check out the official CyberGraphX support page at:
http://www.vgr.com/

... or the official Benoit Support pages at:
http://www.vgr.com/benoit/
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