Kaos Generator 1.01
ClassPad Fractal explorer

Kaos Generator 1.01

The Kaos Generator application allows you to draw and explore 12 different fractals. After you draw a fractal, you can zoom in or out, and move the fractal. You can also change the parameters for some of them, such as Julia set. You can even read information about the fractal, set its iteration number, and save pictures and data files.

1 - Kaos Generator Application Overview

This section describes the Kaos Generator application and provides basic information about its menus and commands.

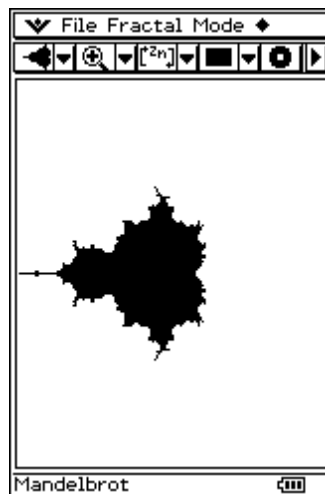## Starting Up the Kaos Generator Application

Use the following procedure to start up the Graph & Table application.

● ClassPad Operation

On the application menu, tap
This starts the Kaos Generator application and displays the Fractal window.

Kaos Generator Application Window

When you start up the Kaos Generator application, the Fractal window appears on the display.

The application automatically draws the fractal.

Kaos Generator Application Menus

The menus items will be described in the next sections.

```
[File]      - [Open]
            - [Save]
            - [Save as picture]


[Fractal]  - [Mandelbrot]
            - [Cubed Mandelbrot]
            - [Four Mandelbrot]
            - [Julia]
            - [1/C]
            - [1/(C+.25)]
            - [1/(C-1.40115)]
            - [1/(C-2)]
            - [λ (Lambda)]
            - [1/λ]
            - [1/(λ-1)]
            - [Henon Attractor]


[Mode]     - [Zoom In]
            - [Zoom Out]
            - [Zoom Factor…]
            - [Zoom Box]
            - [Pan]
            - [Reset View]
            - [Invert Colors]
            - [Draft Mode]     - [Off]
                               - [Draft x2]
                               - [Draft x4]




[♦]         - [Iteration]
            - [Increment]
            - [Goto coordinates…]
            - [Information]
            - [Set Julia constant]
            - [Set Attractor]
```

Kaos Generator Application Status Bar

The status at the bottom of the Kaos Generator application shows the name of the current fractal selected.

Cubed Mandelbrot ▄▄

Here, the Cubed Mandelbrot fractal has been selected.

2 - Tracing fractals

This section explains how to trace fractals and change the fractal type.

When you start the application

When you start Kaos Generator, the Mandelbrot fractal is automatically selected and drawn on the Fractal window.

Selecting the fractal type

You can select the fractal mode by clicking on the ◀▼ drop-down button (the first from the left side), or on the [Fractal] menu. Here is the list of available fractals.

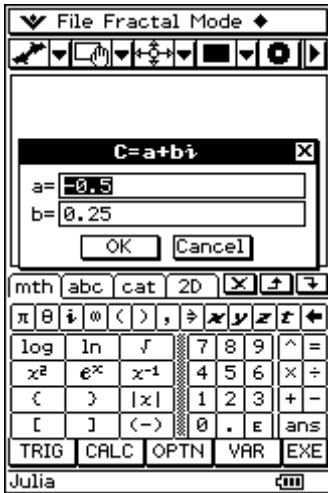| To do this:	Tap this button:	Or select this menu item:
Select the Mandelbrot fractal	◀	Fractal - Mandelbrot
Select the Cubed Mandelbrot fractal	³◀	Fractal - Cubed Mandelbrot
Select the Four Mandelbrot fractal	⁴◀	Fractal - Four Mandelbrot
Select the Julia set	↗	Fractal - Julia
Select the Inverted Mandelbrot fractal	▶	Fractal - 1/C
Select the +0.25 Inverted Mandelbrot variant	▶	Fractal - 1/(C+.25)
Select the -1.40115 Inverted Mandelbrot variant (Myreberg's point)	◀ ⊣	Fractal - 1/(C-1.40115)
Select the -2 Inverted Mandelbrot variant	◀▶	Fractal - 1/(C-2)
Select the Lambda fractal	◀▶	Fractal - λ (Lambda)
Select the Inverted Lambda fractal	◖	Fractal - $1/\lambda$
Select the -1 Inverted Lambda variant	▐	Fractal - $1/(\lambda-1)$
Select the Henon attractor	⟩	Fractal - Henon Attractor

Here are some screenshots of some of these fractals (you can see the name in the status bar):
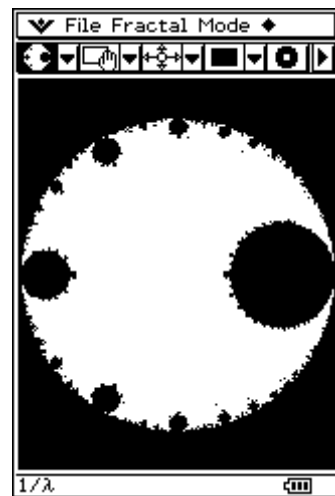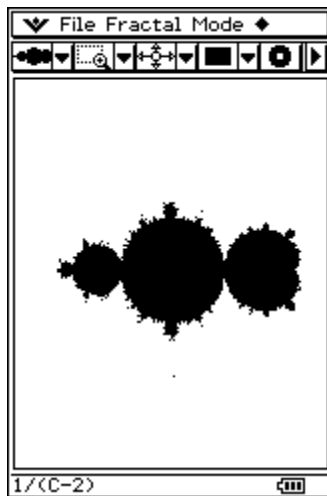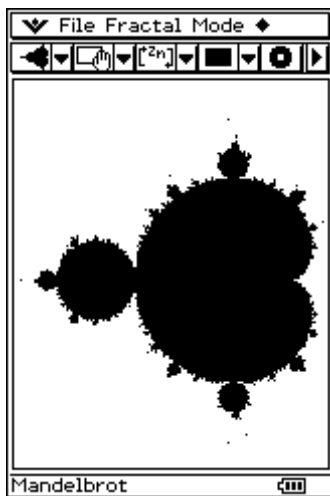
When you select the Julia fractal, or Henon Attractor, you can set their parameters by clicking on ♦ - Set Julia Parameter, or ♦ - Set Attractor (depending which fractal you are displaying). When you have clicked, you must enter the values in the input fields.

C=a+bi

a= -0.5
b= 0.25

OK   Cancel

mth abc cat 2D

π θ i ω ( ) , ⇒ x y z t ←
log ln √ 7 8 9 ^ =
x² eˣ x⁻¹ 4 5 6 × ÷
( ) |x| 1 2 3 + −
[ ] (−) 0 . E ans
TRIG CALC OPTN VAR EXE

Julia

Julia Fractal

x₀ : y₀

x₀= 1
y₀= 0

OK   Cancel

mth abc cat 2D

π θ i ω ( ) , ⇒ x y z t ←
log ln √ 7 8 9 ^ =
x² eˣ x⁻¹ 4 5 6 × ÷
( ) |x| 1 2 3 + −
[ ] (−) 0 . E ans
TRIG CALC OPTN VAR EXE

Henon Attractor

a : b

a= 1.4
b= 0.3

OK   Cancel

mth abc cat 2D

π θ i ω ( ) , ⇒ x y z t ←
log ln √ 7 8 9 ^ =
x² eˣ x⁻¹ 4 5 6 × ÷
( ) |x| 1 2 3 + −
[ ] (−) 0 . E ans
TRIG CALC OPTN VAR EXE

Henon Attractor

Henon Attractor

How to stop and pause the fractal tracing

You can stop tracing the fractal by pressing the Clear key. You can also pause and resume it by pressing the ← key.

3 - Using Zoom and Pan tools

This section explains how to navigate in the fractal using the Zoom and Pan tools.

Overview of the Mode menu

You can use navigation tools by clicking on the 🔍▼ drop-down button, or on the Mode menu. Here are the 6 first functions (the others will be explained in the section 4):

To do this:	Tap this button:	Or select this menu item:
Switch to zoom-in mode	🔍	Mode - Zoom In
Switch to zoom-out mode	🔍	Mode - Zoom Out
Zoom in the center of the screen with a defined factor	🔍	Mode - Zoom Factor...
Switch to zoom box mode	🔍	Mode - Zoom Box
Switch to Pan mode	🖐	Mode - Pan
Restore the window settings	🌐	Mode - Reset View

Using zoom tools

When you are in Zoom In or Zoom Out mode, just click on the part of the fractal you want to zoom. When you are in Zoom Box mode, you must draw a box by dragging the stylus on the screen.

The Zoom Factor tool is different, because it is not a mode. When you select it, it displays an input dialog where you must enter the zoom factor. If you tap OK it will zoom in the middle of the screen with the factor you entered.

You can perform Fast zoom by pressing + or - keys. + is similar to Zoom In but it zooms automatically in the middle of the screen. - is similar to Zoom Out but zooms automatically out the middle of the screen.

Pan

When you are in Pan mode, you have just to drag the stylus to move the fractal.

Restoring default window parameters

Reset View restores the default parameters (xmin, xmax, etc...).

4 - Using display tools

This section describes the two others tools in the Mode menu.

Overview of the functions Draft and Invert Colors

Here are the toolbar buttons and menu items corresponding to these functions:

To do this:	Tap this button:	Or select this menu item:
Switch between Normal colors and Inverted colors	⬢	Mode - Invert Colors
Draw all points	⬛	Mode - Draft Mode - Off
Draw only 1 point out of 2	▦	Mode - Draft Mode - Draft x2
Draw only 1 point out of 4	⣿	Mode - Draft Mode - Draft x4

Invert Colors

Select Mode - Invert Colors to invert the colors in the fractal. The check-box is checked if the colors are inverted.

Draft Mode

If the tracing becomes too slow, you can select Mode - Draft Mode - Off, Draft x2 or Draft x4 to switch between the 3 modes. The radio buttons show which is selected.

5 - Setting parameters

This section explains how to set the parameters and some other practical tools.

Overview of the ♦ menu

Here are the toolbar buttons and menu items corresponding to the functions:

To do this:	Tap this button:	Or select this menu item:
Set the iteration number	[²ⁿ]	♦ - Iterations
Set the increment in pixels	↔⊹↔	♦ - Increment
Move to the entered coordinates	[x,y]	♦ - Go to coordinates...
Get information about the fractal	❶	♦ - Information

Iterations

If you don't have much knowledge about sequences, iteration number is the number of times the sequence is calculated. So more there are iterations, more the fractal has details, more the calculation is slow. For the Mandelbrot fractal, when the iterations number is 1, you get a circle! To set the iterations number select ♦ - Iterations and enter a number in the input field. When you want to zoom in a part of the fractal, it is advised to set Draft x2 or Draft x4 if you don't want to wait hours before finding what you searched.

iter=8	iter=15	iter=100
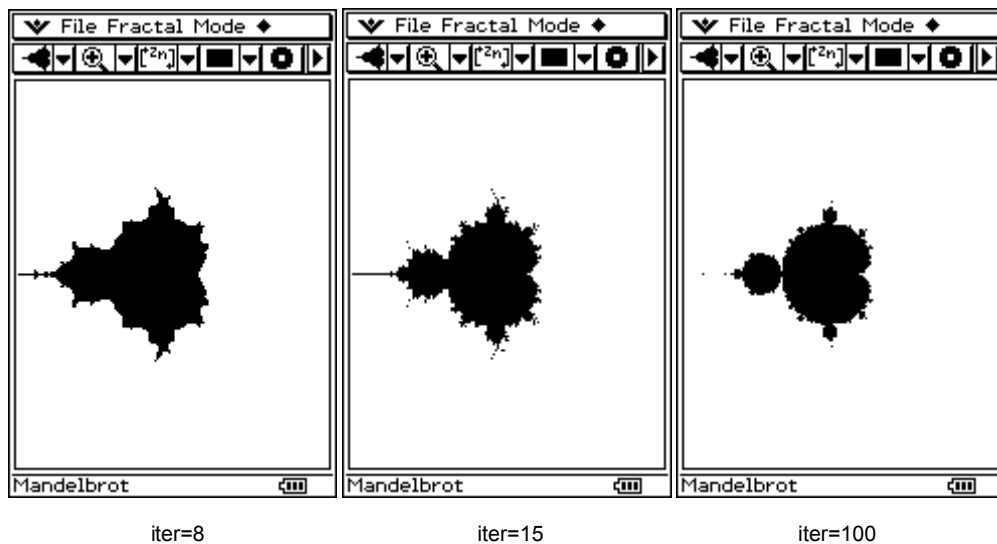
Increment

When you press ◀, ▶, ▲ and ▼ buttons, the fractal moves from about 20 pixels. You can modify this offset by selecting ♦ - ♦ - Increment and entering you increment in pixels.

Go to coordinates

If you want to go to a precise location, use ♦ - Go to coordinates and enter the coordinates in the input fields.

Information

You can get different information about the fractal type, the location, the zoom factor... by selecting ♦ - Information. Here is a screenshot you can get:

```
┌─────────────────────────────┐
│ ▐  Information        ⊠ ▌   │
├─────────────────────────────┤
│ │Fractal Mode:            │ │
│ │Mandelbrot               │ │
│ │                         │ │
│ │Coordinates x;y :        │ │
│ │x=0.025974               │ │
│ │y=-0.894274.             │ │
│ │                         │ │
│ │You are at 141 pixel(s)  │ │
│ │from the origin.         │ │
│ │                         │ │
│ │You are at pixel         │ │
│ │(4;141).                 │ │
│ │                         │ │
│ │Zoom ×4.10321741         │ │
│ │                         │ │
│ │                         │ │
│ │        ┌──────┐         │ │
│ │        │  OK  │         │ │
│ │        └──────┘         │ │
│ └─────────────────────────┘ │
│ Mandelbrot            ▭     │
└─────────────────────────────┘
```
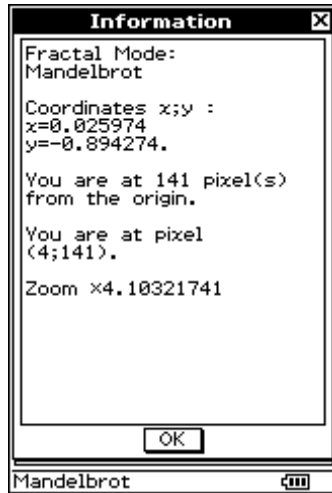
6 - Saving and opening files

This section explains how to save and open data files and pictures.

Overview of the File menu

Here are the functions used to save and open files:

To do this:	Tap this button:	Or select this menu item:
Load a data file	📂	File - Open
Save a data file	💾	File - Save
Save a picture	📧	File - Save as picture

What are data files?

Data files contain the window settings, the actual fractal mode and the iterations number. They use "FILE" type.

You can save or load a data file by selecting File - Open or File - Save.

Saving pictures

If you want to keep a screenshot of the fractal, select File - Save as picture. The picture obtained has a 160x193 format.

7 - About - Changelog

About

You can see in ✦ - About to get more information.

Kaos Generator 1.01 programmed by TRUONG The Vinh "Kilburn".
Great thanks to Brian Maguire.   www.casiocalc.org

Visit the ClassPad SDK website   www.cpsdk.com
... and the French ClassPad forum http://casiocalto.free.fr/Forum

All downloads can be found at   www.classpad.org

Bug reports and suggestions can be sent at kilburn@free.fr
General Public License 2005

Changelog

ver.1.01 : Added Zoom functions, Lambda fractal and its variants.