FracTrip - version 2.2 for Windows

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Overview

FracTrip allows you to generate images of the Mandelbrot Set. It lets you explore this fascinating Set and enter the wonderful world of <u>fractal</u> geometry in a simple and intuitive way, allowing you to save the generated images, and to create "film sequences" that can demonstrate one of the main features of the fractals: the recursivity. You can also save, load and review the film sequences.

The film sequences are created zooming in or out an image leaving unchanged the center. With FracTrip you can also zoom inside any region of a displayed image by just selecting an area to zoom into and issuing the command <u>Zoom in</u>, or even automatically, if the <u>Autostart</u> and the <u>Autozoom</u> option are set.

You can easily modify the pre-set color palette by mixing together 8 main colors, set the background color, which corresponds to the Mandelbrot Set, change the color intensity and swap to a B/W palette.

All the parameters that FracTrip uses to generate the images are pre-set in the best way, however you can change any of them in order to alter the normal proceeding of generation of an image (E.G. the more you zoom in, the higher the number of iterations must be, if you want to leave unchanged the detail of the new image).

At start-up, the program draws the first image automatically, since the "Autostart" option is set by default. The image generated by default is the whole Mandelbrot Set.

About the Mandelbrot Set

"Yes, beautiful, but ...   what is it?"

The Mandelbrot set is without doubt the most famous of the <u>fractals</u>. It is the graphical representation of a function of a variable defined in the <u>complex</u> plane. The Mandelbrot set consists of all the complex numbers for which the **sequence**
$Z_{n+1} = Z_n{\char`\^}2 + C$ $(Z_0 = C)$
does not approach infinity. This sequence has the property that when the <u>magnitude</u> of Z_n exceeds the value 2, the magnitude of Z_{n+1} will also exceed this value and become larger and larger within a few iterations.

Every pixel on the window corresponds to a complex number. FracTrip calculates the sequence for each of these pixels, for at most a certain number of iterations (iteration = the value of n). If the magnitude of Z_n does not exceed 2, the point probably belongs to the Mandelbrot set, otherwise, if the magnitude exceeds 2 before the n iterations are calculated, the complex number surely lies outside the set (see menu Options -   <u>Iterations</u>).
The dot on the screen is plotted in a color that depends on the number of iterations FracTrip has to calculate before the sequence diverges. So, the colored area represents the set of complex numbers for which the sequence diverges after a certain number of steps.
The beauty of the Mandelbrot set is at its boundary. The sequence calculated for points with almost identical coordinates may have a totally different behaviour: in one case it may diverge, in the other not. Exploring this area may produce magnificent, unexpected images.

A **complex** number is a number in the form
C = X + i * Y,
where X and Y are real numbers, and *i* is the **imaginary** unit, defined as the square root of -1. The algebra of complex numbers follows that of real numbers, with the particularity of *i*, so, for instance, the square of a complex number is
$C^2 = (X+iY)^2 = X^2 - Y^2 + 2XY$.
A complex number is usually represented as a **point** on a plane where the real numbers are represented on the X axis and the imaginary numbers on the Y axis. It is called the **complex plane**.

The **magnitude** of a complex number is defined as the square root of the sum of the squares of its components:

$$|C| = \text{sqrt} (X\char`\^2 + Y\char`\^2).$$

A **fractal** image is generally a geometrical shape that can be subdivided in parts similar to each other, each of which is a lower-scale copy of the whole. A fractal image reveals more and more details the "deeper" one goes, and every detail in a smaller scale looks like the detail itself in a larger scale.
The boundary of the Mandelbrot Set is a **fractal curve**. It consists of innumerable parts composed of miniatures of themselves.

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Save As command (File menu)

Use this command to save the displayed image. The image is saved as a bitmap.

Exit command (File menu)

Use this command to exit FracTrip.

Notice that if you generated a film or a single image, you lose everything if you exit without saving.

Start Drawing command (Image menu)

Use this command to start drawing the actually chosen <u>area</u> of the Mandelbrot set.

When you select this menu item, the window becomes the color that was chosen for the background (black by default), and then the image starts being painted. The final image is generated after a few steps, each of which draws a part of the complete image, with closer pixels. This feature is useful when you are looking for a particular zone of the Mandelbrot set and you just want to see what the image "looks like", not what it really is.

If the *Show every pixel* mode is selected among the <u>Show Modes</u>, every pixel of the image is painted on the screen as soon it is calculated. If the *Show whole picture ad end* or the *Show at intervals* option is enabled instead, the picture is painted on the screen respectively at the end or after the specified period, with a speed increment of about 30%.

Issuing this command is only necessary when the <u>Autostart</u> option is not set, since otherwise drawing begins automatically when the program is loaded or when a <u>zoom</u> operation is performed.

If the <u>Film</u> item in this menu is checked, FracTrip does not generate just one image, but a sequence of frames, to create a film according to the options that have been set in the Options - <u>Film parameters</u> dialog box.

When FracTrip is generating an image, it only allows you to stop it: the only available command is <u>Pause drawing</u>.

Resizing the window while the image is being generated does not produce any consequence, and the program continues generating the image according the previous dimensions of the window.
Resizing the window when the program is idle, causes FracTrip to use the new dimensions of the window to generate the new image. The new image will cover the entire window.
You may notice that if you enlarge the window without changing the Area parameters, you obtain the same image in a larger scale, losing something at the top and at the bottom, while if you lengthen the window, the image maintains the same scale.

By default the area selected at the start-up shows the whole set.

Pause Drawing command (Image menu)

Use this command to temporarily stop the program while you are drawing an image. This is useful when you want to change some parameters, such as the Iterations, without waiting for the image to be completed.

Drawing can be resumed by using the command Resume Drawing in this menu.

This command is available only in phase of drawing.

Resume Drawing command (Image menu)

Use this command to restart drawing from the point you stopped it, with a previous <u>Pause Drawing</u> command.

This command is available only if a previous Pause Drawing command was issued; it is not available if a filmis loaded.

Film command (Image menu)

Use this command to quickly enable / disable the production of a film sequence. When it is enabled, a check mark is placed near the menu item.

All the parameters about the film are in the Film Parameters dialog box, available through the Options - Film Parameters menu. If you start drawing with this option enabled, a film sequence is produced, instead of a single image, according to the values shown in the dialog box.

Selecting this menu item you get the same result as selecting the *Film* check box in the Film Parameters dialog box.

Zoom In command (Image menu)

Use this command to zoom in a particular region of the actually displayed image.
Before issuing this command, you must select the region you want to zoom in. To do this you must:
    place the mouse on one of the corners of the region,
    press the left button,
    move the mouse to the opposite corner of the region, keeping the button pressed,
    release the button.
Now the region is selected and you can zoom in.

If you try to zoom without selecting a region, you get an error message.

When you zoom in a region and the New Window option is set, FracTrip opens a new window, whose dimensions are proportionate to those of the selected region, in a larger scale. If the Same Window option is set instead, the actual window changes its dimensions the same way and the current picture is deleted. The new dimensions depend on those of the old window: a Zoom In given from a "little" window produces another "little" window and vice versa, independently of the dimensions of the selected region.

If the Autozoom option is set, the new window is opened (or the current window is resized) as soon as the mouse button is released.
If the Autostart option is set, FracTrip automatically starts drawing the new image.

The new window inherits all the parameters of the old one, except for those i the Area dialog box.

Copy command (Image menu)

Use this command to copy the current image to the clipboard.

Through the clipboard it is possible to import the image into other programs without saving and reloading it; the whole image in the current window is copied.

Area command (Options Menu)

Use this command to see or modify the area of the <u>complex</u> plane for which the Mandelbrot set has to be calculated.

You can specify the real (X - horizontal) and imaginary (Y - vertical) coordinates of the **center** and the **width** of the plane. The point defined as the center corresponds to the center of the current window, while the width corresponds to the width of the window. The height is automatically calculated by the program.

As a consequence of that, you may notice that if you enlarge the window without changing any of these parameters, you obtain the same image in a larger scale, losing parts of it at the top and at the bottom, while if you lengthen the window, the image maintains the same scale.

If you want to <u>zoom</u> into the actual image leaving the center unchanged, you can do it by modifying the value of the width, reducing it. Increasing this value is the only way to zoom out.

A set of pre-defined examples is available. To choose an example, enable the *Examples* check box and select one of the examples in the list. When an item of the list is high-lighted, the corresponding parameters appear in the *Center* and *Width* fields. Once an example is chosen, it is possible to modify the values of center and width. To do that, the check box must be unselected.

The area selected by default shows the whole Mandelbrot set.

Iterations command (Options Menu)

Use this command to change the maximum number of iterations FracTrip has to perform for every <u>point</u> in the selected <u>Area</u>, to produce a single pixel.

To produce an image, FracTrip computes the <u>sequence Zn</u> for each point for at most a certain number of iterations. This value, N, is pre-set by the program and is changeable in this dialog box.

For every point, FracTrip evaluates the magnitude of the sequence Zn at every step. If the magnitude of Zn does not exceed the value 2, the point **probably** belongs to the Mandelbrot set, otherwise, if the magnitude exceeds 2 before the N iterations are completed, the point **certainly** lies outside the set.

FracTrip attributes to the Mandelbrot set all the points of the first type (magnitude <= 2), but many of those that "probably" belong to the Mandelbrot set, do not really, since the sequence Zn might diverge after the computed N iterations.

If the value N is very low (20, 30, ...), the program will reach the end of the iterations for a larger number of points and the resulting image will be worse, but the computing will be faster. If the number of iterations is higher (300, 400...), the calculation for each point will take longer, but the image will have sharper details.

If the <u>Film</u> flag is on (you are producing a film sequence) and the *Keep unchanged the detail level* check box in the <u>Film Parameters</u> dialog box is checked, this command is disabled and this value is ignored.

Film Parameters command (Options Menu)

Use this command when you want to set up all the options to generate a film sequence.

To enable the window you must click in the *Film* check box, unless it wasn't previously checked.

A film is composed of a some quantity of frames that, rapidly displayed in sequence, give the sensation of movement. All the sequences generated by FracTrip are centered on one point, and based on zooming in or out starting from a certain <u>width</u>.

Quantity of frames: you can choose the number of frames the film will be composed of, by entering this number in the appropriate entry field. If your computer's memory is not enough to keep in mind all the frames you want to generate, you get a warning message while generating the film, and the film ends at the last completed frame.

Zoom in / out: you can choose to zoom in or out by activating the *Zoom in* or the *Zoom out* radio buttons.

Detail level: the more you zoom in, the higher the number of iterations must be, if you want to leave unchanged the sharpness of every new image. If you activate this check box, FracTrip increases (for Zoom in) or decreases (for Zoom out) the quantity of iterations for each frame. If this check box is left unchecked, the quantity of frames doesn't change, and as the number of iterations FtacTrip will use the value in the <u>Iterations</u> dialog box.

Zoom at each frame: you can select the "speed" of zooming by giving a percent value in this field. The value 1 gives the slowest zooming, the value 100 gives the fastest.

Advanced options: these options control the <u>curve of growth</u> of the number of iterations for each frame.
> **Base value:** this is equivalent to the number of iterations needed to generate a frame whose width on the <u>complex</u> plane is 1.
> **Iterations' increase:** this is the number of iterations added (or subtracted) every time the interval on the real axis decreases to 1/10 (or increases by 10) . This parameter controls the "speed of growth".

Iterations - 1st Frame...: all the changes to the parameters in this dialog box affect the number of iterations. The exact number of iterations that will be computed by the program for the first and the last frame of the film are displayed here. These values are read-only.

Save Intermediate files: besides saving all the film as a *.flm* file, you can save on disk every single frame of the film. The first time you enable this check box, you are asked for the name of the files. Consider that only the first 5 characters of the name that you type in are valid, since FracTrip adds to this name the characters 001, 002... The common part of the file name is visible in the read-only field on the bottom-right side of the window.

File Name: push this button to change the name of the intermediate files.

Show Mode command (Options Menu)

By default FracTrip generates an image showing every pixel, as soon it is ready to be displayed. This characteristic is useful when you want to have an idea of what the next image will be.
If you are generating a film, instead, you will desire it to be completed as soon as possible, so you can defer displaying and increase speed by up to 30%.

Show every pixel: every pixel is displayed on the screen as soon it is calculated.

Show whole picture at end: the whole picture is displayed when it is completed. When generating a film, each frame is displayed after completion.

Show at intervals: the picture is displayed at time intervals. This option can be useful with large images. The scrollbar near this option lets you choose the amount of time FracTrip has to wait before displaying the next portion. Use this option carefully, a too low time interval (<500 ms.) can slow down the process, and even result slower than the *Show every pixel* option.

Zoom to command (Options Menu)

When a <u>zoom in</u> command is issued, or when a zoom area is selected and the <u>Autozoom</u> option is set, a new window is opened to contain the image that is going to be generated. If you want FracTrip to draw the new image into the same window, without opening a new one, put a check mark on the **Same Window** menu utem.
If you want FracTrip to open a new window every time a new zoom is requested, put a check mark on the **New Window** menu item.

When an option is set, a check mark is visible near the menu item, which is disabled.

By default, at startup the **New Window** option is set.

Autostart command (Options Menu)

Use this command to set the Autostart option.

When this option is set, FracTrip automatically starts drawing the image. This happens when the program is loaded and when a <u>zoom</u> operation is performed.

When this option is not set, it is necessary to manually issue the <u>Start Drawing</u> command from the Image menu to start drawing the new image.

At startup, this option is set by default, therefore FracTrip automatically starts drawing the first image.

Autozoom command (Options Menu)

Use this command to set the Autozoom option.

When this option is set, FracTrip automatically performs the <u>zoom</u> operation when a zoom area is selected.

When this option is not set, it is necessary to manually issue the zoom command in order to zoom into the selected area.

If the <u>Autostart</u> option is set too, FracTrip opens the new window and starts drawing the new image when a zoom area is selected.

At startup, this option is set by default.

Set Defaults command (Options Menu)

Use this command to reset all the default values.

All the values displayed in the <u>Area</u>, <u>Iterations</u>, <u>Film Parameters</u> dialog boxes, all the value concerning the film and the colors are reset to the default values.

The program ask you to confirm, first.

Curve of Growth

If you want to leave unchanged the level of detail (the sharpness of the image), proceeding with the zoom, the number of <u>Iterations</u> needed to   compute the <u>sequence Zn</u> has to grow. Around the highest level of zoom that FracTrip can reach (an interval's <u>width</u> of about **1*10^-14**), about **500** iterations are required, while for a width of 1 (**1*10^0**), **94** are enough.

On a system of axis, where
               x = exponent of interval's width   and
               y = iterations,
the equation of the straight line passing through the points (-14, 500) and (0, 94) is
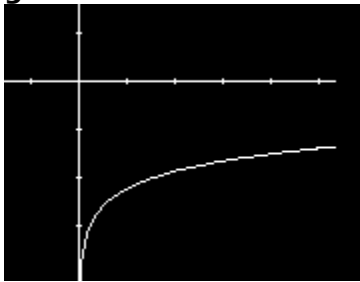 $y = -29x + 94$.
Since, given the exponent x, the width of the interval is given by log10(x), we obtain:
               $y = -29 \log10(x) + 94$,   which is equivalent to
               iterations = $-29 \log10(\text{width}) + 94$.

The numbers 94 and 29 are the pre-set values that you can change in this window.

On a system of axis where *x = interval's width* and *y = iterations*, this is the **curve of growth**.

Animate command (Film Menu)

Use this command to start animating a film.
The film must exist: it must have been either created or loaded, first (see Options - Film Parameters command), otherwise this command is disabled.

The animation is executed according to the Animation Settings and the Animation Speed.

Stop Animation command (Film Menu)

Use this command to stop a film while it is being animated.
This is useful especially when the <u>Pong</u> or the <u>Continuous</u> option are set.
The film cannot be restarted from the point it was interrupted; it must be restarted from the beginning.

The film must exist: it must have been either created or loaded, first, otherwise this command is disabled.

Animation Settings command (Film Menu)

Use this command to change the default film settings.
This menu item contains a sub menu with the commands: **Pong**, **Reverse** and **Continuous**, each of which can be checked or unchecked.

If **Pong** is checked, the film is played forward and backwards uninterruptedly, regardless of the **Continuous** option.

If **Reverse** is checked, the film is played once backwards.

If **Continuous** is checked, the film is played forwards uninterruptedly.

If both **Pong** and **Reverse** are checked, the same result as **Pong** is obtained, but the first time the film is played backwards.

If both **Continuous** and **Reverse** are checked, the same result as **Continuous** is obtained, but the first time the film is played backwards.

Animation Speed command (Film Menu)

Use this command to change the default speed used to play the film.

In this dialog box you can vary the speed from a value of **0** (slowest) to a value of **15** (fastest).

Depending on the speed of the computer you are using, you will notice, however, that also the highest speed is sometimes too low!.

Load Film command (Film Menu)

Use this command to load into memory a previously saved film.

If another film was present in memory, the new film replaces it.

When using this command, you are prompted for the name of the film. The default extension is **.flm**.

Save Film As command (Film Menu)

Use this command to save a film present in memory.

The film must exist: it must have been either created or loaded, first, otherwise this command is disabled.

Palette command (Colors Menu)

Use this command   to view or change the colors of the currently used palette.

FracTrip creates a palette by mixing together eight main colors: Blue, Yellow, Magenta, Green, White, Black, Red, Cyan. These colors, in the given order, make up the default palette. This palette can be reset by clicking on the **Original** push button.

If you want to create a new palette you can **Clear** the current one and then activate the **Set New** check box and click on the colors' push buttons. Instead if you want to change just one of the main colors in the current palette, you can avoid clearing it and then act as before.

When you click on a color's push button, the corresponding color is placed in the current position in the palette and automatically mixed to the colors on its right and left.

By clicking on the **Color Intensity** push button you can change the intensity of all the colors of this palette. Every color in the palette is a combination of three components: Red, Green, Blue. Each of these elements can assume values from 0 to 255 (the highest level of intensity). For instance the Red color has components: (255, 0, 0), the Green has: (0, 255, 0), the Yellow has (255, 255, 0).
If you reduce the intensity of a component, you simply obtain to reduce the *brightness* of all the colors of the palette which have that color among their components: if you reduce the Red and the Green to 200, you will see a *darker* yellow in your palette.
The **Color Intensity** push button in this window opens the same dialog box as the Intensity menu item in this menu.
The eight main colors are chosen by default at the highest level of intensity.

When you set the original palette, you automatically set the original intensities of the three components.

Notice that if you change the default palette, the background color does not change.

Changing a palette, affects the current image or film: theit color are converted to the new palette.

On non palette-based displays, a 255-colors palette is generated.

Background command (Colors Menu)

Use this command to change the color of the main window's background.

You can choose for the background any of the colors of the current palette, which are displayed in this window. By clicking on one of these colors, the value of its three components (Red, Green, Blue) are displayed on the top of the window. This color becomes the next background only if you select the **OK** push button.

The current image in the main window is not affected by changing the background color. In fact the background is changed to the new color only when a new image is generated.

If you change the default palette, the background color does not change.

The background represents nothing but the Mandelbrot set! (see About the Mandelbrot set).

Intensity command (Colors Menu)

Use this command to vary the intensity of the single components of the colors.

By this command you can change the intensity of all the colors of the current palette. Every color in the palette is a combination of three components: Red, Green, Blue. Each of these elements can assume values from 0 to 255 (the highest level of intensity). For instance the Red color has components: (255, 0, 0), the Green has: (0, 255, 0), the Yellow has (255, 255, 0).
If you reduce the intensity of a component, you simply obtain to reduce the *brightness* of all the colors of the palette which have that color among their components: if you reduce the Red and the Green to 200, you will see a *darker* yellow in your palette.

You can open this dialog box also by clicking on the **Color Intensity** push button in the palette window. In that case you will see a real time variation of the palette when varying the intensities.

The intensities of the three components are set to the highest values by default. They are also reset to these values if you click on the **Original** push button in the Palette dialog box.

Quantity command (Colors Menu)

Use this command to reduce or increase the number of colors in the palette.

This is a sub menu containing 3 items; you can choose among 2, 16 or 256 colors. The value selected by default is the highest number of colors supported by your computer. All the higher values are disabled.

If you reduce a palette from 256 to 16 colors, the new palette is composed of 16 out of the 256 colors of the first palette, taken one every 16. Notice that if you increase it again to 256 colors, you do not obtain the original palette back, but a 256-color palette in which each of the 16 colors is repeated 16 times. The same you obtain decreasing and increasing between 16 and 2.

When a value is selected, a check mark is placed near the menu item, and the menu item is disabled.

Grey Scale command (Colors Menu)

Use this command to create a palette composed of a scale of greys.

This palette is generated from the current one by transforming every color in its nearest grey. The formula used to calculate the nearest grey for a color is the *distance, that is the* square root of the sum of the squares of the color's Red, Green and Blue components.

When you issue this command, a check mark is placed near the menu item. Unselecting "Grey Scale" does not give back the previous palette. If you want to recreate a colored palette, you must do it yourself.

Paste Palette command (Colors Menu)

Use this command to paste a palette from the Clipboard.

FracTrip does not contain a palette editor which allows you to edit each color, yet. So, if you want to create a particular palette, you can use any other program to create it, and then copy the palette to the clipboard. Once the palette is copied, it can be imported into FracTrip through this command.

Notice that when you issue a Zoom in command, or automatically zoom into a region, and the New Window option is set, the new instance of FracTrip inherits the parent's palette. This palette is passed from the parent to the child through the clipboard. FracTrip will erase the previous contents of the clipboard.

Index command (Help Menu)

The *Index* command opens the help window.

Registering command (Help Menu)

This command displays all informations you need if you decide to register. You can read the same information about registering in this help.

Disclaimer command (Help Menu)

This command displays the text of Disclaimer. You can read the text of <u>Disclaimer</u> in this help too.

Terms of Use command (Help Menu)

This command displays the conditions you are subject using FracTrip. You can read the text of   the <u>Terms of Use</u> in this help too.

Author **command (Help Menu)**

This command displays all informations you need if you want to contact the Author. The same informations about the <u>Author</u>   are contained in this help too.

About FracTrip command (Help Menu)

The window opened by this command shows some informations about FracTrip

Terms of Use - Disclaimer

FracTrip is distributed as a shareware program. It is NOT a public domain program. However, you are encouraged to copy it for trial purposes.

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You agree not to:
a) modify, disassemble, reverse engineer or decompile the program,
b) use this program on more than one terminal of a network, on a multi-user computer, on a time-sharing system, on a service bureau, on any system on which the program could be used (other than for trial purposes) by more than one person at a time.

Suggestions and Bug Report

If you spot   bugs, or have comments or suggestions about the program, please write to the he Author.

All your suggestions will be accepted and, if possible, included in the subsequent release. In any case you will be noticed (e-mail only) on the acceptance of your suggestion.

Next Releases

It all depends on you to decide how long it will take to produce a new release. If you appreciate this work and the hard efforts to produce this program, please register. This will help the Author produce new releases faster and better.

There are many things to be done, some of which are more exciting, some others more useful. The exciting features will surely be reserved to the registered users, while the useful ones will probably be available to all. If users won't ask for something useful in particular, the exciting features will be realized first.

The main new features in the to-do list are:

More fractals (Julia, Plasma Clouds, ...),
Printing,
3D projection,
Cooperative processing on a network for speed improvement,
Saving user-defined options to a configuration file.
Compression of .flm files

Author

If you want to contact the author of FracTrip you can write to:

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All your messages are welcome.

Registering

If you try FracTrip and decide to use it, you must register your copy. If you do not register your copy, you are not authorized to use the program beyond an initial evaluation period of thirty (30) days.

By registering, the Author grant you a permanent license to use this copyrighted computer program, in the current version, on a single computer at a time, subject to the terms and conditions of this license.

The registration fee for FracTrip is **US$30.00** (thirty). When you register, you will receive your personal registration code and any information on future upgrades to the program. The registration code is strictly personal; it cannot be given away or sold.

To register FracTrip, send the registration fee to:

Letizia Di Nunno
Viale D. Pietri, 22
00122 ROMA - ITALY

Requests for "group" or "unlimited" licenses will be accepted and examinated.
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If you register now, you will have all future upgrades to this version for FREE, should even the registration fee grow.

Restrictions for non registered users

Non registered users are subject to some restrictions, detailed below.

When FracTrip is working, the window must be in the foreground, that is the window with the focus, otherwise it interrupts generating the current image. This is because non registered users should use FracTrip for evaluation purposes only.

FracTrip's window must be completely visible; if the window is partially or totally out of the screen, FracTrip interrupts.

If the window is maximized, minimized or resized, FracTrip interrupts.

Deferred show modes are disabled, and the picture is displayed pixel by pixel. Deferring display improves speed by up to 30%.

Zoom to same window option is disabled. This feature allows all zooms be displayed into the same window.

Save Film As option is disabled.

Other products from the same Author

Plasma Clouds screen saver for Windows.
If you like fractals, you'll surely like Plasma Clouds screen saver.
Plasma Clouds draws fractal clouds on the screen in an endless variety of forms and colors.
You can never know what the next image will be. This screen saver doesn't show you the pictures you provide, it CREATES them.
You have the freedom to choose what kind of clouds you want to see, and have the freedom to let the computer make this choice for you. You can change colors, define how "stormy" your clouds must be, and set up special effects, such as moving clouds and psychedelic colors.
Coming back to your computer and watching the screen saver in action, you will hesitate touching your mouse or keyboard!
Plasma Clouds is FAST. It doesn't take minutes to produce an image, it takes SECONDS: about 3 seconds(!) on a Pentium 70 Mhz, 640x480; 42 seconds on a 386 20 Mhz without math co-processor.
Plasma Clouds is CHEAP. Just US$5.00 to get registered is really VERY cheap, especially if you consider what you have in change.

This list may have been changed since it was produced, so ask the Author for the updated list.