DiamondBOX

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Chapter 1

DiamondBOX

1.1 Welcome to DiamondBOX

D i a m o n d B O X

V pre3

About A little title thing

Author Who did this

What is this? A quick note

Tutorial How to begin

Background Some relevant info

Keyboard abuse Should you use the keyboard?

Setup How to setup the system

Disclaimer Legal stuff

History What goin' down?

To do What needs to be done to DiamondBOX

1.2 Intro to DiamondBOX

What have we here?

DiamondBOX is a photo retouching system meant to ease the lives of its users though it might not always seem so :o) It's heavily layer based, which might hurt the learning curve a bit.

It is definitely Work-In-Progress, so there's still a long way to go, so don't be too hard on it. Installation is straight forward - unpack the archive to a drawer of your choice. No messy assigns to worry about. This guide was thrown together very fast, so I hope you don't find too many typos. Feel free to report them.

Life's too short to worry about yesterdays technology (funny phrase on an Amiga :o), so you will need the following to try out DiamondBOX:

- A 16/24 bit GfxCard running CGFX 2+

- A 68020 is minimum, but I fear you'll soon come to a crawl when using too many layers.

- 8 Mb RAM should get you goin', but adding at least another 32 Mb will do you good.

1.3 Tutorial

Tutorial

First, open a picture...

After starting the program, click on the title/about pic to make it go away. Select "Open..." from the ToolBox menu - this opens a standard file requester, from which you should choose an IFF picture of yours.

Second, create a primary layer...

Next thing you select the Layer::Manager window (= LM) and select "New primary layer" from the menu. This pops up a window asking you to select the effect to attach to this layer (called an effect layer). Choose the "Boing Ball" effect which paints a checkered pattern on the picture. Finally you can paint away in the window containing the loaded picture. If you want to apply other effects to your picture, go to LM and add a new layer. You can basically add effects to your hearts content, but there is a speed penalty to pay somewhere along the line depending on your processor (yes, I know support for PPC would be great, and I do have one, but that'll have to wait).

Third, alter characteristics of the effect...

Some effects have parameters changable in the LM window. Selecting an effect in the upper list of the window reveals the parameters of the effect of that particular layer. Should you want to change the effect of the currently selected effect layer, this can be done w/ "Change effect" from the LM menu. One effect "Mono Filter" has its own drawer in the DB tree, namely the "ColorFilters". Here you'll find a couple of palettes which can be applied to pictures giving you different kinds of monochrome pictures - Weird palettes are possible as well.

Try changing "Boing Ball" to "Painter" - select "Update layers" from the menu to see the changes. Go to the toolbar and open one more picture, then back to LM and select a texture with "Select texture". From the popup select the new picture, and "Update layers". All the stuff you previously painted should now be covered with pixels from your second picture. Not all effects accept textures, but they won't tell you. Try it out and see what happens.

Changing Brush characteristics...

The brush used for applying paint can be slightly customized. Go to Toolbar and select "Windows/Brush...". This opens another window showing a little black square in the lower half. This is your brush, and by increasing the size and pressure, you can see how it affects your brush on the black square. The brush is global, so you can go right away to your picture and use it. The upper right icon in the Brush::Manager opens a popup allowing you to select the overall shape of your brush.

Generating new pictures...

Go to toolbar and select "Generate...". Select the desired generator from the popup. These are just small programs that generate different kinds of pictures. This is where you'll find the scanner interface in the future. The "Mandelbrot" is just a quick hack based on an old BASIC thing I made years ago. One of the generators , called "New Paper" will create a new picture based on the "width" and "height" supplied in the requester. Notice some generators require a picture as a parameter, and for these you need to invoke the wanted generator from the editor menu with either "Operate frozen" or "Operate active". The first will use the unretouched picture whereas the second will operate on the picture visible in the editor window.

What's in the Toolbar...

The last thing I'll mention in this small but messy tutorial are the buttons of the Toolbar. From there you can select the kind of shape to use when applying effects in a layer. Apart from Brush there's a line, square, ellipse, Flood fill, connected lines and a lightning tool. The little star like shape (which was supposed to be a gear - originally) allows you to choose a generator , and the two icons containing a diskette are used for loading and saving pictures. The palette button allows you to select what color to use as default for some effects . Pretty useless really, but now it's there :o) I guess it might go away one day. The way to exit the palette requester is just to click somewhere else on the screen.

Alpha Channels...

Some effects alter the alpha channel instead of the paint of your picture. The alpha channel is just a layer deciding how much you're allowed to paint on individual image pixels in the editors. If the alpha channel is 100% or white the effect will cover the image underneath completely, but an Alpha Channel value of 0% or black will leave the image unchanged. Values in between 0 - 100 corresponding to grey scales will apply more or less of subsequent effects to the image.

What does Activate and freeze mean??

If you don’t want to apply anymore paint to a certain layer just select it and choose "Freeze" from the LM menu. From then on you can no longer apply paint to that layer. "Activating" the layer means that the you’re reopening it (thawing it - the opposite of freeze). Likewise you can freeze the paint and alpha channel parts of your picture to make your changes permanent. This can’t currently be undone! If you have opened the same picture in another editor, these frozen changes will affect that other copy as well, but not until you select the window of that editor.

PHEEW - I hope this has given you an idea of how to work w/ DiamondBOX, otherwise I take the blame. This was basically just meant to get you going, and I hope sure you can figure some stuff out yourselves as you go. In case of real trouble, just ask me - I should know :o)

1.4 Available effects

Available effects

Alpha Channel:

This is a global effect meaning it doesn’t need to be painted on. It affects all effects applied after itself. If you leave the slider in Layer::Manager around the middle all subsequent effects will cover only 50%. Applying two Alpha Channels around 50% results in an effective 25% Alpha Channel - they affect each other. Alpha Channels accept textures, so that only brighter parts of the texture will allow application of subsesquent effects.

Boing Ball:

Actually kind of a joke, but nevertheless it applies a checkered pattern to the image. The size of the checks can be adjusted with the two numeric gadgets in Layer::Manager.

Brightness:

With this little sucker you can change the brightness and contrast of the image. Changing the top slider allows you to increase brightness in a linear fashion. The Gamma slider alters brightness in a more "selective" fashion affecting darker pixels the most. Changing the two contrast sliders you can narrow the amount of colors used in the image effectively increasing contrast. The more adventurous individuals can play around with the bottom ten sliders to be even more selective about it all. All values in between slider values are interpolated.

Convolution Matrix:

This is a multipurpose effect, which actually isn’t that well suited for interactive drawing, since it messes up the display slightly, and to get a real view of what the picture looks like, you may need to refresh the view. Depending on the matrix in question this effect can f.ex. blur, sharpen or edge detect the picture.

Explosion:

When paint is applied with this effect the color chosen will be somewhere between the two colors in Layer::Manager, depending on how much paint is applied. The dark color will be used for smaller amounts of paint whereas larger amounts of paint will draw the color towards the bright color.

Monochrome:

The basic functionality of this effect is to convert color images into monochrome/grey scale. If you press the little smily, you can select a "filter" (An IFF ILBM w/out a BODY chunk, but a 256 entry palette), which will then work as a filter changing the grey scale values into other intervals. A few of these filters have been provided in the "ColorFilters" drawer.

Mosaic:

Selects one pixel from the image and uses it for all pixels in a rectangular block of the image. Select the block size in Layer::Manager

Negative:

This effect negates the part of the image being painted - just like a photographic negative.

Painter:

This is the basic paint effect which accepts textures, making it a composition tool as well. Using the picture itself as a texture this effect can function as a clone effect also.

Randomize:

Useless experiment I did. I included it just in case anyone might find find a use for it.

Reset Alpha:

This global effect allows for absolute setting of alpha channels, meaning that no matter what the previous Alpha Channel was, it will be reset to what ever value is chosen with the Layer::Manager slider.

Saturation:

Increases saturation of the image. Select amount of increase with the slider in Layer::Manager.

Solarize:

This is an extreme brightness thing which tilts past 50% brightness and makes those brightest parts of the image negative.

1.5 Available generators

Available Generators

In the following you'll find a description of the current set of implemented generators. Some of these will expect an argument picture (denoted with an "(arg)"), and in this case you should invoke the generator from the editor menu with "Operate frozen" or "Operate active". The first will use the unretouched picture whereas the second will operate on the picture visible in the editor window.

Colored Backdrop:

Will create a backdrop picture in which you setup the dimensions of the picture, and the colors at the four corners. The rest of the picture will then be interpolated between these four colors.

Crop Image(Alpha): (arg)

This advanced crop generator uses the alpha channel of the picture to decide which pixels to crop, with 0 meaning source pixel not used, and 255 meaning source pixel used. The values in between will interpolate the source pixel color with the global color selected in the generator dialog. One way of using this generator is by painting some effect onto the picture, and stuffing the canvas into the alpha channel with "Canvas/Canvas => Alpha". Finally invoke, the "cropper" from the picture. Notice, this will alter the frozen Alpha channel, so you should reset the Alpha Channel afterwards if you need to do further editing on the picture.

Flip Left <=> Right: (arg)

This mirrors the source picture around the Y-axis into a new picture.

Flip Top <=> Bottom: (arg)

This mirrors the source picture around the X-axis into a new picture.

Mandelbrot:

Creates a picture of the mandelbrot set. You enter the dimensions of the picture, and the max number of iterations before a point is considered part of the set. A few seconds later you get a picture of the good old set - no you can't zoom in!!

New paper:

With this little thing you can create a new piece of white digital paper. The dimensions can be entered in the two numerical gadgets.

Scale dimensions: (arg)

Will create a new rescaled picture based on the source picture. Use the slider to quickly change the size gadgets maintaining the aspect ratio.

1.6 Keyboard abuse

Keyboard abuse

As previously stated some things are done w/ the keyboard. These details will be addressed below:

<Shift>:

is used to invert the effect of tools on the Canvas - w/out <shift> you can paint w/ LMB, but w/ <shift>-LMB you'll remove paint from the Canvas. In LM <shift> is used for multi selecting layers (removal). When closing an editor, holding down <shift> will close only the changes, but keep the frozen picture.

<Arrow Up/Down>:

are currently only used to move layers up and down in LM - can be done from the menu as well.

<ESC>:

abort dialogs for f.ex. generators .

<Return>:

is a real goodie. Apart from accepting dialogs, when used in LM, it tells the current picture to refresh all its layers. This can be done from the LM menu as well, and will also happen automatically when current picture is selected.

1.7 DiamondBOX fundamentals - Nice to know

Background

In the following paragraphs we'll take at look at some of the internals of DiamondBOX.

When you open a picture the following happens: DB opens your picture and stores it in 24 bit along with an alpha channel. Next thing it opens an editor window with a canvas, a reference to the opened picture, but no layers. All manipulations done to the picture in the editor window will be only temporary, and opening a second editor with the same loaded picture ("Project/Edit..." in Toolbar) displays the original picture, but with a different canvas. All painting is done on the canvas of the active window, and this canvas will be attached to the active layer of the current editor. A frozen layer has it's own private frozen canvas which can't be altered in any way. When rendering effects in the editor the canvases are combined with the alpha channel before applying paint to the picture.

To make changes available to all editors referring to a certain picture, you must freeze the contents of an editor. When done you can close the editor, but the picture is STILL loaded, and can be edited later on, or just left hanging around in case you need it as an texture later on.

You might wanna close all unused editors as they consume quite a lot of RAM. Talking about RAM abuse - printing with the TurboPrint saver allocates a second copy of the picture which can also quite memory consuming.

Useful words to understand:

Picture: Well :o)

Layer: is like a transparent piece of onion skin placed on top of your picture. All modifications will go to this layer allowing you to remove all modifications by simply removing the layers in question.

Canvas: Is the active layer. Only one layer can be active at a time.

Effect: All modifications applied to the canvas are translated through an effect, so that where ever you apply paint to a canvas, the corresponding effect will be applied to that particular part of the pictre.

Primary Layer: This a layer having it's own reference to the canvas, and an effect as well.

Group Layer: This is a kind of layer which doesn't do anything in itself. It holds a reference to the canvas. but that's all.

Secondary Layer: This kind of "layer" actually only has it's own effect, and borrows the physical layer/canvas from the previous Group Layer. This can be useful if a number of effects need to be applied to the same part of a picture. A Secondary Layer can not be activated as it refers to a Group Layer for information on where to paint.

Freeze: Means making changes permanent. Freezing a layer means making it unavailable for further editing. Freezing RGB and/or Alpha Channel means copying those parts of a picture to the unchanged background copy.

Generator: A little program generating pictures maybe based on a set of parameters, and in some cases an argument picture as well.

1.8 DiamondBOX tool types

Setup

If you wanna avoid a couple of icons in the Toolbar, they can just be dragged from "buttons" drawer into the "storage" drawer from WorkBench. DB needs at least one button in the Toolbar, but I'm sure you can live w/ that.

The "Pebbles" drawer contains all Effects , Generators , ... If you don't need some of these just move them into the "Storage" drawer before opening the program.

I must admit that I'm not a settings fetichist, so don't expect stuff like NewIcons support, or wild config managers and themes. Still the program icon contains a few tooltypes as listed below:

PubScreen: What Public Screen to use (which must be 15/16/24 bit - no builtin public screen manager).

LAYERMAN_X: X-coordinate for Layer::Manager.

LAYERMAN_Y: Y-coordinate for Layer::Manager.

TOOLBAR_X: X-coordinate for ToolBar.

TOOLBAR_Y: Y-coordinate for ToolBar.

PICTURE_PATH: The default drawer containing pictures.

BRUSH_NAME: Name of brush to use as a default.

STACK_SIZE: Stack size for all "threads" (pictures, Layer::Manager, ...)

1.9 Stuff left to do

To do

A lot of things haven't been implemented yet, as I'm currently concentrating on stability and the basic functionality. If you open a 1000X1000 picture and add 30 layers at once, it might seem like DiamondBOX has gone down, but don't worry, it's just got a lot to do, and should return sooner or later (Maybe I should add a progress bar in that case). A good idea is to add one layer modify it and freeze it, then add another, and so on. This will reduce the number of needed calculations drastically.

If you've got an idea for a great effect , and maybe even have some source code or the likes, just tell me, and I might give it a try. A relatively trivial effect can be implemented in about half an hour.

1.10 ***** ERROR *****

Error Back and forward not allowed!

1.11 Who am I

About me

I currently work as a systems consultant developing all different kinds of things for different kinds of companies. I'd like to tell you all about it, but then I'd have to kill you :o) In case you need to contact me please use one of the e-mail addresses below:

Nikolaj_Thygesen@bigfoot.com // Always linked to current address, but I've had complaints.

nkt@ecsoft.dk // My current company address.

1.12 Everyone’s got one - I want one too!

Use DiamondBOX at your own risk

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* *

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* *

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1.13 Release Note

Changes

Pre Release #3:

- Added tolerance setting for flood fill in Tool::Manager

- Added Tool Type "STACK_SIZE". Default is 100000. This should suffice for smaller

pictures, but flood filling large pictures may kill you. In that case try upping

the stack limit. Do *NOT* use the std. WB Stack setting of the icon.

- Changed behaviour of CLOSE gadget in editors => kill frozen picture as well

If shift held frozen picture will be kept in RAM.

- Added lightning draw tool - fractal line

- Added line draw tool

- Added support for several layer types in Layer::Manager

- Renamed old type layers => Primary Layers

- Added "Group layers"

- Added "Secondary layers"

- Added effects: "Explosion", "Saturation" and "Convolution Matrix"

Also added useless experiment "Randomize"

- Added generators: "Flip Left <=> Right" and "Flip Top <=> Bottom"

- Added saver: "RGB8"

- Fixed Enforcer hit from Layer::Manager

- Improved TurboPrinting - still some way to go

- Added "Position Texture" to the "Picture/Tool menu"
- Added menus "Picture/Operate frozen + active"
- A bunch of other improvements and bugs fixed

Before PR #3

- Nothing recorded