Credits

The <u>FishEye</u> and <u>Twist</u> transforms were translated and modified from Visual Basic code written by Rod Stephens. I also modified some of his code for the smooth resize and Rotate Angle. He's the author of 'Visual Basic Graphics Programming', a great resource (even if it is VB). I can only hope that he becomes enamored of Delphi and decides to write a book for that platform.

The Color Noise and Spray effects came from authors that contributed to a Delphi unit called FastBMP, by Gordon Cowie III. FastBMP is an <u>excellent</u> free tool.

The Gradient Bars is an adaptation from a newsgroup post by (I think) Bjoern Ischo. I'm still waiting for his article in the UNDU newsletter.

The Help file was created using Helper by Kenneth Rochel de Camargo Jr.

All other effects and filters are mine (Harm).

Installation

Installation is simple. Unzip the files. You are done.

HarmWave can be run by double clicking on the HarmWave.exe file. The files can be placed in any folder you like. Keep these files in the same Folder for the Help menu item to work. Files included:

HarmWave.exe - program executable
HWave.hlp - this file, my excuse for help
HWave.cnt - more help file
HWave.toc - more help file

HarmWave does not use any *.dll files, everything is self-contained. It only updates the registry to change the wallpaper settings, it does not put any application-specific information there. To uninstall HarmWave:

Delete files HarmWave.exe, HWave.hlp, HWave.cnt, and HWave.toc from the directory where you installed them. If you did a test wallpaper, delete the file HarmWave.bmp from your windows directory.

Introduction

HarmWave is a graphics application that is used to design <u>seamless 'Tiles'</u> for use as Windows wallpaper or background as Web pages.   It has many filters and effects, and can also be used for photo re-touching.

It was developed using Borland (Inprise) Delphi, a great development tool.   This help file was created using Helper by Kenneth Rochel de Camargo Jr.   It's a great FREE help authoring tool.

HarmWave is freeware.   As such, you get what you pay for.   I have tried very hard to make sure it functions properly, but all code is prone to bugs.   If you have problems or a bug report, I will make a very determined effort to rectify the situation, but I make no promises.   I can be reached at

<div align="center">harmans@uswest.net</div>

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Seamlessness

Making an image seamless is not an easy task. A lot of the effects here will maintain a seamless image, but what about an image that's not already there? I have a couple of methods to help with this situation, but neither is foolproof. They are accessible from the Image menu item, under the Seamless submenu. The first is <u>Edge Merge</u>. It copies opposing edges and blends them in to the right and bottom. It will copy 1/16, 1/8, or 1/4 of the image for blending. The other method, <u>4 Way Flip</u>, re-sizes the image. It copies the image and mirrors it left/right, up/down, and l/r/u/d. The image ends up being twice as big, but for pattern type images it works well. Use the ReSize to get the image back to its normal size, or crop out the piece you want. If your image has an unwanted border, use the selection tool to crop the image and then use the edge merge method.

NOTE! - To use your image as a web page background, you may want to 'dim it down' so the text is legible. Here's the technique I use: Once you have an image, save it in the buffer. Erase to Black the image. Do a Negative to make it all white. Then, merge the buffer by 25 % or less. This makes a very light image. Or, you can make the text of your web page white or some other light color to show up against a dark background image.

System Requirements

HarmWave was developed for my own purposes, so it is designed to work on my system. It will not work very well on anything less than a Pentium. It will fit on a 640 X 480 screen, but I developed it on 800 X 600. I did not provide for different resolutions, so 800 x 600 and small fonts looks best. Win95 or higher is required.   It has been tested on Win95, Win98, and Win NT 4,

I also use 24 bit (True) Color. 16 bit (High) color works OK, but 256 colors look bad. For best results, set your monitor resolution to True or High Color.

Some video cards have a reputation for not correctly handling certain graphics operations. It works great on my machine, which uses a Matrox card. This is not an advertisement for them, I'm just stating the facts, in the event that this program does not function correctly on your machine.

Design a Gradient

The fastest way to get started with HarmWave:

Click on the small E near the bottom of the treeview to fully expand it.   Then double click on the Gradient entry.

This will invoke the gradient designer dialog.   Use the combo boxes and edit boxes to design your gradient, then click OK.   Your gradient will be copied to the image workspace, and a thumbnail will be visible in the preview window.

Creating your First Image

Click the small E to expand the treeview, and double-click Gradient.   Accept the default by clicking OK in the Gradient Designer dialog.   You should now have a blue vertically centered gradient.   The gradient thumbnail will have a smaller version of the image workspace.

My examples will always attempt to use the shortcut keys - once you learn these, HarmWave is a lot easier to navigate.

The next step is to alter the color a bit by rotating the color.   The fast way to do this is to use the key combination Ctrl-O.   The same effect could be achieved by going to the treeview, in the Color section, and double-clicking on the Rotate Color.   Or, you could select the menu item under effects (it has the same structure as the treeview).   At any rate, the image is now green on the top & bottom and blue in the center.

Now we'll rotate it 45 degrees (and maintain seamlessness) by using this key combination: Ctrl-Alt-S.   You should now have the image at a 45 degree angle.   Seamless rotate will shrink the image just a little.

The next thing we'll do is use the buffer to store our image for use in the next step.   To copy the current image into the buffer, use the key combination Alt-B-C.   This steps through the menu items to copy the workspace to the buffer.   The buffer thumbnail now shows a small version of the image.

Let's do a mirror Left/Right of the workspace, with the key combination Ctrl-L.   The workspace and buffer should now appear as mirror images of each other, although the buffer thumbnail is quite a bit smaller.

Next, we'll merge the buffer with the current workspace image by doing a Alt-B-M.   This merges the two images into the workspace.   You can change the percentage of buffer image, but for now let's leave it at 50%.   You should now have a green and blue kind of X image.

To finish this first effort, let's throw in a Fish Eye effect.   This is done with the key combo Ctrl-F.   You should now have a star-kind of image.   To see how this will look as wallpaper, use the key combo Alt-I-T.   This will minimize all windows so you can see the wallpaper more easily.

Using the Buffer

The buffer is used to store an image.   There are several operations that can be performed using the buffer.

The buffer is populated by copying the current image to it, pasting clipboard contents into it, or loading a file into it using an open file dialog.

Once an image is in the buffer, it shows in the preview window.

The buffer can be copied to the clipboard, pasted into the current image, or merged with the image by a percentage.

All these options are available from the Buffer menu item.   The merge buffer option is also available under the Draw branch of the treeview.

The buffer can also be used as the texture for a <u>Map texture</u> operation.

The buffer is a handy place to store an image while you experiment with other effects.   Or, it is also handy to store an image for later use in a merge operation or a map texture.

Drawing Tools

The drawing tools are available from the top toolbar.   Because of their nature, none maintain seamlessness.   The tools are as follows:

Pen - Draws freehand style using the current Pen Color, Pen Width, and Pen Mode.   Is actually a series of lines, so looks kind of jagged.   Compensate by doing a blur or soften.

Ellipse - Draws ellipses (circles or ovals) by clicking and dragging to desired size, using current Pen Color and Width.   If the Fill Shape checkbox is checked, then the ellipse is filled with the Brush color.   Ignores Pen Mode.

Rectangle - Draws rectangles by clicking and dragging to desired size, using current Pen Color and Width.   If the Fill Shape checkbox is checked, then the rectangle is filled with the Brush color.   Ignores Pen Mode.

Line - Draws a straight line using current Pen color, width, and mode.

Flood Fill - Click an area to fill it with the current Brush color.   All contiguous pixels of the same color are filled.

Text - Click anywhere on the image to invoke the Text Designer dialog.   After the text is the desired font, size, color, etc. click OK and then drag the text to the location you desire, then click to drop it.   This tool is still kind of flaky, the X and Y values don't accurately reflect the left and top of the text.

Selection Tool - Click and drag to outline a part of the image.   When the mouse is released, the selection dialog is invoked.   You can copy the selection to the clipboard or buffer, or crop the current image to the selection.

Eyedropper tool - Click somewhere over the image to set the Pen Color to the pixel's color where you clicked.

Fill Shape checkbox - when checked, ellipse and rectangles will be filled with the brush color. Otherwise, they are 'hollow'.

Pen Size - specify the width of the pen in pixels.

Pen and Brush Color - Clicking these buttons invokes a color dialog to specify a new color.

X and Y values - These provide feedback on where the cursor is when mouse is over the image, in relation to the upper left corner.

The Gradient Designer

One of the primary tools of HarmWave is the Gradient.   It seems to make the best '3D' like textures without true 3D coding.

The Gradient Designer is invoked in one of two ways: through the Gradient menu item, or through the treeview under the Draw branch.   There is a difference in the end result;   the menu option will only reflect the newly designed gradient in the thumbnail, while the treeview Draw option will paste the gradient into the image automatically.

The Gradient Designer dialog allows you to set the size of the gradient and the colors. Currently, HarmWave gradients only supports two color gradients.   The Begin color is generally at the top or left, while the End color is at the right or bottom.   There are also two radial style gradients.   These two gradients make use of the angle for starting point.

It's my opinion that using two colors that are opposite or very different in lightness works best.   For instance, using dark blue and light blue (like the default colors) provides for a nice contrast, whereas Light Blue and Very Light Blue are not very effective together.   The color values can be seen in the color selection dialog by clicking the Define Custom Colors button.

There are eight gradient styles available:

• Vertical
• VertCenter
• Horizontal
• HorzCenter
• Rectangle
• Elliptic
• Radial1
• Radial2

Some gradients are automatically seamless, while others are not.   Vertical (top to bottom) is not seamless, nor is Horizontal (left to right).   VertCenter, HorzCenter, Rectangle, and Elliptic are all seamless.   Radial1 is not seamless.   Radial2 can be seamless, only if the angle is set to: 0, 90, 180, 270.   Otherwise, it is not seamless.

Experimentation is the best teacher for how the gradients work, and what colors look best together.

Menus

Nearly all the HarmWave functions are available via menu items.   Some functions are ONLY available from menu items (like the seamless options).

They behave just like normal windows menus, with the exception of the menu items under the Effects and Pens.

Normally, menu items have a key combination that gets invoked by first pressing Alt, then pressing a key that's underlined.   Using this technique, you can navigate through the menu system without using the mouse.   The effect items don't have this feature, because I assigned shortcut keys to all of them.   Having both seemed like overkill.   The Pens have neither, you must use the mouse to select those menu items.

To be more productive with HarmWave, it would help to learn the accelerator keys and shortcut keys, to reduce your 'mousing'.   I will make an attempt to provide the key combinations for all functions somewhere in this help file.

Thumbnail Previews

The thumbnails for the Gradient and Buffer are blank when HarmWave is first started. When a Gradient has been designed, it is reflected in the preview window.   The buffer preview will reflect the image currently in the buffer.

The buffer is populated by using one of the menu items under the Buffer selection.   It can be loaded from a file, from the clipboard, or from the current image.   When it has an image, it is reflected in the preview window.

The previews are for visual feedback, as more of a reminder.   They are very small representations, so will not accuratley reflect the underlying images.   Pasting either the gradient or buffer to the image will show them at their full size.

The Treeview of Effects

The treeview is a hierachical list of all the effects that HarmWave can apply to the image.   It is divided into different functional sections:

• Filters
• Distortions
• Color
• Size/Aspect
• Draw

Clicking the small plus sign next to a heading will expand that branch of the tree.   Clicking the small minus sign will collapse a branch of the tree.   To expand all branches of the tree, click on the small button with the E caption.   The caption on that button will then change to a C.   Clicking on the C button will collapse the entire tree.

Select a sub-item by single-clicking to hilite it.   This will make the user input controls for that effect visible in the User input area, just below the treeview, if any are available for that effect.   The selected effect is then executed by using the Execute button.   Or, the effect can be executed immediately by double-clicking the item in the treeview.

Immediately below the treeview window is the Width and Height indicator of the image. These will change anytime the image size changes.

User Input Area

The User Input Area is used to display values associated with the currently selected effect. Not all effects have user-editable values.

These fields, when visible, are available for the user to change or alter the way an effect works.   Some effects have a 'suggested' range, but in most cases, this is not enforced in the code.

Most of the input fields are not checked for valid data;   if you type in alpha characters for a numeric field and attempt to execute the effect, you will get a generic program error. Something like 01bc is not a valid integer value, and no indication of what field is the culprit. It assumes that users don't make typos <g>.

Values are remembered after the execute button is clicked to invoke a given effect. Changing a value and then using the shortcut keys will not pick up the changes...

You can revert to the default value for the selected effect by clicking on the small button with the D (for default) on it.

The user input fields vary widely depending on the effect.   See the help items for individual effects for what's available.

Interface Elements

The HarmWave window has a toolbar along the top with primitive drawing tools. By default the paintbrush is selected, with a black Pen color. Along the left side are the main controls for effects and filters: a treeview control which lists all the options, which will expand or collapse by clicking the small button with the 'E' caption (for Expand); a preview area for the gradient and buffer images; an area for user input; and an Execute button. Some functions are only available from the menus.

BIG HINT - There is one level of UNDO, which is available from the Edit menu or by using the Ctrl - Z key combination.   I find that it gets used A LOT.

Another productivity hint - rather than doing this: use the treeview to select the effect; set values; click execute - you can get there more quickly by using the shortcut keys, then using Ctrl - Z to undo the operation.   This will leave the user input fields exposed, so you can make your modifications and then click on execute.

NOTE! - I use what I call 'Hacks' to accomplish some things.   What may seem like normal windows functions don't work quite the way you would expect.   For instance, I am still working on perfecting the Text tool, and the paste as selection function is a little different.

When an item is selected in the treeview, the User Input area will display the controls where you can adjust values. You can test your image as wallpaper by selecting that option under the Image menu.

The Effects menu item has the same structure as the treeview, and all menu items under effects have a Shortcut key combination assigned.   By learning the keyboard shortcuts to the effects you use the most often, you'll become a lot more productive with HarmWave. Using the treeview quickly becomes tiresome/cumbersome.

Seamless Tiles

As mentioned in the introduction topic, seamlessness is not an easy thing to achieve or maintain.

It's an easy concept - you create a small image whose opposite edges match up perfectly so that when they are 'tiled', you can't tell where the edges are.   I discovered the secret accidentally while experimenting with the SineWave function - you must use the value of Pi. But, that only works for sine waves.   For example, I have not discovered any method for making the Twist function seamless, other than the post-processing method of edge merge or flipping.   For some of the effects, I was able to code seamlessness into their operation, while for others I could not.

Here is a list of the effects that will maintain seamlessness, and those that will not.

Seamless

- All Filters (under the Filters branch of the treeview) except for Gaussian Blur
- All three SineWave functions, UNLESS: the wrap or Use Peaks is NOT checked
- Astroid
- Concentric Rects
- Mosaic
- Circle Mosaic
- Color Noise (kinda)
- Spray (kinda)
- HarmSwizzle
- Map Texture (assumes image and texture are already seamless)
- Marble
- All Color functions in the Color branch
- All Size/Aspect functions EXCEPT Rotate Angle
- Cycloid Mosaic
- Gradient Bars (kinda)
- Gradient - depends on particular gradient
- Merge gradient/buffer - yes, if image and buffer/gradient are already seamless
- Plasma Cloud

Items that say (kinda) mean that they mostly maintain seamlessness, but a soften or blur helps it a lot.

Non-Seamless

- Gaussian Blur
- Twist
- FishEye
- Circular
- Rotate Angle
- Buttonize

The Fisheye may maintain seamlessness if the image is symmetric, but not always.

Rotate Angle will maintain seamlessness if the angle is a right angle (90,180,270).

There are a couple of methods provided to help regain seamlessness, available from the

Image menu item.

Edge Merge - this copies a fraction of opposing sides and blends them into the image on the right and bottom.   You can currently use 1/4, 1/8, or 1/16 of the image for merging.

4 Way Flip - this copies the image and inverts it, making it twice its original dimensions.

Distortions

Distortions are the cool effects.   They will alter the current image, shifting the pixels somewhere else.   They generally don't change any colors.   If I indicate that a distortion will maintain seamlessness, it pre-supposes that the image is currently in that state.

Filters

Nearly all the filters use a modified 3 X 3 convolution.   Where there is a 'more' and a 'less' version of the same filter, the more is a higher intensity.   A 3 x 3 convolution performs some math on a pixel based on the surrounding pixels, which you can visualize like a grid:

    o o o
    o o o
    o o o

Ther are other versions of this same concept, like a 5 x 5 convolution, triangle, diamond, etc. These either are more difficult and slower, or don't have the quality of the 3 x 3 (IMHO).

Here's the list of currently available filters, and a short description of what they do:

• Soften More (Ctrl - Alt - Y)   Softens rough jagged edges
• Soften Less (Ctrl - Y)   Softens rough jagged edges
• Edge Enhance More (Ctrl - Alt - A) Sharpens edges, adds a touch of brightness to them
• Edge Enhance Less (Ctrl - Alt - B) Sharpens edges, adds a touch of brightness to them
• Edge Emboss More (Ctrl - Alt - C) Full color emboss effect, from top left to bottom right
• Edge Emboss Less (Ctrl - Alt - D) Full color emboss effect, top left to bottom right
• Classic Emboss (Ctrl - Alt - E) GrayScale Emboss, allows user control over lightness.   Will still have hints of color.
• HiPass (Ctrl - I) Adds a sharp glow to lines and edges
• Sharpen (Ctrl - S) Sharpens the image, enhances edges
• Laplace (Ctrl - P) Glowing edges, darken everything else
• Blur (Ctrl - Alt - H) Makes the image a bit fuzzy - very similar to soften
• Find Edges (Ctrl - Alt - F) Very dark filter, top down edge finder
• Gaussian Soft (Ctrl - Alt - G) Similar to Blur
• Gaussian Blur (Ctrl - G) Will make a very blurry image, allows user control over degree of blurriness
• Design Your Own (Ctrl - F5)   This allows direct input on the values applied to the pixels. Experimentation is encouraged.

The filters are mostly self-explanatory. You'll find that after some Distortion operations, one or more of the Filters can make the image look a lot better. Most do not have any user adjustable values, you just invoke them.

Astroid (Ctrl - A)

   This is a messy effect, I haven't perfected it.   I almost didn't include it with this release, but then decided that if people don't like it, they don't have to use it.   Oddly enough, it maintains seamlessness.   To get the best results, here's a hint on how it works: It reads the column of pixels on the extreme left side of the image, and bases it's pixel calculations on those.   A VertCenter gradient works best to illustrate.   To create an interesting border around your image, follow these steps:

1. when your image is ready for a border, go to the scroll option in the Size/Aspect group. Use the scrollers to scroll exactly half the image width left, and exactly half the image height down.
2. copy your image to the clipboard with Ctrl+C
3. design a new gradient.   Make it a VertCenter style, with colors that will complement your image in the clipboard.   Make the gradient two pixels wider than your image in the clipboard.   Paste it into the image.
4. use the menu to paste as selection.   Watch the title bar, and position the selection at 1,0 - then release the mouse to paste it.
5. you should now have your original image with a very thin line on each side of the gradient you designed.   Invoke the Astroid effect, works best with a setting of 7.
6. Click the Selection drawing tool.   Watch the X Y values, and select a rectangle starting at x=1 y=0 and going to 1 less than the current image width for X, and the current image height for y.   Choose Crop to selection.
7. Go back to the Scroll tools.   Again, scroll exactly half the width and half the height. Voila!   you now have a kind of rounded window around your original image.

Values: Single digit odd numbers.   If you specify an even number, I just make it odd. (I'm an odd-kind of guy).   Smaller numbers make a thicker effect, while larger numbers make a very thin astroid. (Not asteroid)

Default: 5

Circle Mosaic (Ctrl - Alt - N)

   Similar to <u>mosaic</u>, but draws circles instead of squares.   User input is the diameter of the circle.   Will leave some of the original image visible in the 'cracks' (space between circles). Maintains seamlessness.

Values: integer values for diameter of circles.

Default: 6

Hint: use single digit numbers.

Circular (Ctrl - W)

   This is similar to <u>twist</u>, but it only works correctly on 256 x 256 images.   It will work on other sizes, but not very well.   You'll get a warning if your image is not 256 x 256, but then it will go ahead and execute unless you click Cancel. Does NOT maintain seamlessness.

No user settings.

Color Noise (Ctrl - Alt - P)

Adds specks (noise) of color to the image.   The higher the number, the more intense the colors.   Maintains seamlessness.

Values: recommended 1 - 500

Default: 50

Concentric Rects (Ctrl - Alt - O)

   Nothing fancy here.   This draws a smaller copy of the current image directly in the center, repeatedly, until the last rectangle is about half the size of the original.   User input is the number of pixels to decrease the size of each successive rectangle.   Maintains seamlessness.

Values: 1 - 100

Default: 25

Fisheye (Ctrl - F)

   This will make the image bulge out from center.   Does NOT maintain seamlessness, UNLESS: the image is a mirror image.   See 4Way Flip under <u>seamlessness</u>.

You will notice some strange things in the user input area for this effect.   It uses a real number, and it sometimes will get changed from 0.25 to 0.24989587989.   It's a quirk of Delphi, and hopefully I will get it fixed in the next release.

Using very small values will produce non-fisheye type results, but interesting nonetheless. Using a value larger than 1.25 will mostly just magnify the image.

Values: 0.01 - 5.00

Default: 0.75

HarmSwizzle (Ctrl - H)

   This effect takes advantage of the pixel loss for <u>fast resizing</u> (StretchDraw).   You can achieve the same thing by doing the following: Set the Up/Down Sine Peaks value to match the current image width, and execute.   From the menu, do a 4Way Flip.   Then, do a ReSize Fast back to your original image dimensions.   I incorporated those things into one procedure because I found myself doing that sequence a lot.   Maintains seamlessness.

Values: 1 - 200   (actually, is limited to image height).

Default: 64

Map Texture (Ctrl - F2)

It doesn't really map texture. It is actually a contraster. It uses either the image in the buffer or an image you load from a file (or it keeps the image from the last map operation). It converts it to gray scale, then uses the values (0 - 255) as a multiplier to adjust the brightness of the pixels in the image.

It obviously works best if you have a smooth gradient kind of image to use as the texture file, with a wide range of dark and light shades.

See the examples section for some of my favorite texture images.

It will maintain seamlessness as long as the texture file and the current image are already seamless.

User input allows control over the brightness of the contrast. Higher numbers are brighter.

Values: 10 - 30

Default: 18

Marble (Ctrl - F3)

Marble is based on a Random Midpoint Displacement Fractal algorithm.   I modified it to be seamless, and you'll notice it tends to be 'squarish' most of the time.   It not only maintains seamlessness, but is also the only 'effect' that will make a non-seamless image into a seamless one.   It does not alter pixel colors, it just moves them around in the image.

It's cool, eh?

User input allows control over graininess, scale, and turbulence.   These are hard to explain, you'll have to experiment with the different values...   Small numbers in graininess makes a smoother marble.   Small numbers in turbulence makes more af a spray-marble.   Changing the scale doesn't do anything (just kidding).

Values:
   Graininess 1 - 1000
   Scale 1 - 12
   Turbulence 1 - 255

Defaults:
   Graininess 700
   Scale 2
   Turbulence 120

Mosaic (Ctrl - Alt - M)

This takes the color of the pixel in the center of the area specified in the user input area and makes squares.   It will kinda maintain seamlessness.   The last column of pixels on the right side might not be square <g>.

But for the most part, it's a seamless effect.

User input allows changing the size (in pixels) of the square.

Values: 2 - 30

Default: 3

Sinewave Both (Ctrl - X)

   This is a mix of the U/D and L/R, but there is no option for using peaks or wavelength.   You may choose how many peaks and their size, but that's all.   Maintains seamlessness, as long as the peaks are whole numbers.

See the description for the Sinewave U/D or L/R.

User has control over the number of up/down peaks and left/right peaks, and their respective heights.

Values
  Peaks U/D: 1 - width of image
  Height: 1 - height of image
  Peaks L/R: 1 - height of image
  Height: 1 - width of image

Defaults:
  P U/D 3
  H   50
  P L/R 2
  H   64

Sinewave L/R (Ctrl - E)

Same description as for <u>Sinewave Up/Down</u>, only the waves go Left/Right.

   This is the first distortion I concocted. It will maintain seamlessness, IF: the wrap checkbox is checked, and the Use Peaks checkbox is checked, and whole numbers are used for Peaks. This allows great flexibility. A peak is the apex of a sinewave, either at the left or right extremity. Therefore, 3 peaks would have two waves pointing right, and one wave pointing left. Unchecking the Use Peaks checkbox allows the user to specify a 'wavelength', and unchecking the wrap checkbox causes the edge pixels to be 'stretched'. Sinewave operations are reversible. In other words, if you did two left/right sinewaves (without changing the settings) then you could mirror the image and do the same sinewave operations again, and the image would return to the starting point.

In the user input area, you can specify real numbers for the Peaks value, as in 2.5. You can also use negative numbers for peaks and height values.

Unchecking the Use Peaks checkbox hides the editbox for Peaks and shows the editbox for wavelength. Wavelength is kind of an arbitrary value, I think. Or, it might be the number of pixels? I don't remember, but it's cool, I think. I rarely use this option, so you probably won't either <g>.

Values
  Peaks: 1 - image width
  Wavelength: 1 - 200
  Height: 1 - image width

Defaults
  Peaks: 2
  Wavelength: 17
  Height: 64

Sinewave U/D (Ctrl - D)

   This is the first distortion I concocted.   It will maintain seamlessness, IF: the wrap checkbox is checked, and the Use Peaks checkbox is checked, and whole numbers are used for Peaks.   This allows great flexibility.   A peak is the apex of a sinewave, either at the top or bottom extremity.   Therefore, 3 peaks would have two waves pointing down, and one wave pointing up.   Unchecking the Use Peaks checkbox allows the user to specify a 'wavelength', and unchecking the wrap checkbox causes the edge pixels to be 'stretched'. Sinewave operations are reversible.   In other words, if you did two up/down sinewaves (without changing the settings) then you could mirror the image and do the same sinewave operations again, and the image would return to the starting point.

In the user input area, you can specify real numbers for the Peaks value, as in 2.5.   You can also use negative numbers for peaks and height values.

Unchecking the Use Peaks checkbox hides the editbox for Peaks and shows the editbox for wavelength.   Wavelength is kind of an arbitrary value, I think.   Or, it might be the number of pixels?   I don't remember, but it's cool, I think.   I rarely use this option, so you probably won't either <g>.

Values
   Peaks: 1 - image width
   Wavelength: 1 - 200
   Height: 1 - image width

Defaults
   Peaks: 3
   Wavelength: 32
   Height: 50

Spray (Ctrl - Alt - Q)

Scatters pixels.   The higher the number, the more scattered the pixels.   Kinda maintains seamlessness, but not really.   There is no wrap coded in to this.

You may find that higher numbers start having less of a scatter effect.   It will take some experimentation.

Values: 1 - 250

Default: 15

Twist (Ctrl - T)

   This will twist, or spin the picture in a sort of double elliptic.   The smaller the number, the tighter the spin.   Does NOT maintain seamlessness.

Values: 1 - 500

Default: 100

Color

   HarmWave uses 24-bit bitmaps for its internal operations.   If you set your screen resolution to True Color, it will look the best.   It will look pretty good with High Color, but some of the effects look a bit odd.

Brighten (Ctrl - B)

   Brightens the image.   I don't provide for user input, you must execute several times if you require a lot of brightness adjustment.   Maintains seamlessness.

   (As with all key combinations, you can hold down the keys to get the keyboard repeat).

Color Rotate (Ctrl - O)

   24 bit bitmaps have their color values stored as separate Blue, Green, and Red values, each of which can range from 0 - 255.   This effect shifts the color bits one position to the left, with the overflow being added to the right.   Since each color is 8 bits, repeating this effect 8 times will change a mostly blue image to a mostly red image, and 8 more times will change it to a mostly green image.   Maintains seamlessness.

Erase to Black (Ctrl - K)

Fills the image with black.   To get other colors, use this, then the FloodFill tool with your selected brush color.   You can probably figure out about the seamlessness part here.

Exchange Color

Oops - I didn't assign shortcut keys to this one.   Oh well, next release.....

This will exchange all pixels that are the Pen color to be the Brush color.   I normally use this in conjunction with the eyedropper tool - first, click to pick up the color for the Pen, then set the brush color to what I want to change it to.   Then, Exchange Color.   It has a tolerance level, so if the color is 'close' it will get changed.   It will maintain seamlessness.

GrayScale (Ctrl - Alt - V)

Changes image to grayscale.   Maintains seamlessness.

Lighten (Ctrl - Alt - T)

Lightens the image.   It tends to wash out colors as they get lighter.   Maintains Seamlessness.

Negative (Ctrl - N)

Just what the name implies, it will create a negative of the current image.   Maintains seamlessness.

Tint (Ctrl - Alt - U)

   This invokes a color selection dialog.   It tints the entire image to the chosen color.   If it 'erases' the image, try doing a grayscale and then do the tint again.   Maintains seamlessness.

Size/Aspect

Resizing or rotating an image will mostly maintain seamlessness, with the exception of the <u>Rotate Angle</u> option.

Keeping your image fairly small will keep the performance at an acceptable level.   The smooth resize is pretty good at not distorting when enlarging an image.

It's not necessary to maintain seamlessness if you are creating an image that will not be tiled, like 800 x 600 for one big wallpaper.

Mirror L/R (Ctrl - L)

This flips the image so the left side is now on the right.   Maintains seamlessness.

Mirror U/D (Ctrl - M)

This flips the image so the top is now on the bottom.   Maintains seamlessness.

Resize Fast (Ctrl - Q)

   Invokes the <u>Sizer dialog</u>.   It uses Windows StretchDraw to do the resize, which tends to add or drop pixels.   Sometimes that's what you want.   For a more accurate resize, use <u>smooth</u>.   Might maintain seamlessness, depending on how extreme the ratio of width/height changes.

Resize Smooth (Ctrl - R)

    Invokes the <u>Sizer dialog</u>.   Uses a resampling method to resize.   It looks better, but performance is a bit slower.   Maintains seamlessness.

Rotate 90 (Ctrl - Alt - X)

This rotates the image 90 degrees clockwise.   To rotate an image 90 degrees counterclockwise, do this 3 times.   Maintains seamlessness.

Rotate Angle (Ctrl - Alt - R)

   Rotates the image, wrapping pixels (instead of resizing the image), to the angle specified. Does NOT maintain seamlessness.

Values: 0 - 360

Default: 45

Rotate Seamless (Ctrl - Alt - S)

   Rotates the image by 45 degrees, and will maintain seamlessness.   THE IMAGE MUST BE SQUARE.   If not square, you will be prompted to resize and try again.   Shrinks the image somewhat.

Scroll (Ctrl - Alt - K)

This exposes the scrollers in the user input area.   Clicking the arrows will scroll the image by the amount specified.   Click and hold to repeatedly scroll.   Maintains seamlessness.

Draw

The draw functions actually add or replace pixels in the image.   All have some sort of user input functions…

Buttonize (Ctrl - U)

   This draws a Highlight and Shadow on the image, width specified by user.   The current Brush color is used for the Highlight, and the Pen color is used for the Shadow.   Does NOT maintain seamlessness.

Contrasting colors (dark and light) seem to work best, but it also depends on the main colors in the image.

Values: 1 - half of image width/height

Default: 20

Cycloid Mosaic (Ctrl - Alt - L)

   A flaky kind of effect, it draws a pattern of squares (or dots, depending on user input). Maintains seamlessness.

   It only has one color scheme, and you can't change it.

Values: 3 - 30 (size of squares)

Default: 3

Draw Gradient (Ctrl - J)

   Invokes the <u>gradient designer dialog</u>.   When the gradient has been designed, it is automatically pasted into the image.   Depending on the gradient, will maintain seamlessness.   VertCenter, HorizCenter, Rectangle, and Elliptic are seamless gradients.

Gradient Bars (Ctrl - Alt - W)

   A different kind of gradient, it draws vertical bars of gradient.   The number of bars is user specified.   The gradient colors are the current gradient colors.   Maintains seamlessness. To draw horizontal bars, use this, then do a <u>rotate 90</u>.

NOTE - these sometimes aren't real seamless.   Sometimes it helps to do an edge merge right after you draw these, before adding other effects.   It helps, a little.

Values: 1 - 30

Default: 3

Merge Buffer (Ctrl - Alt - J)

   Will merge the current buffer with the current image.   User specifies percentage of buffer image to merge.   Maintains seamlessness IF: both the buffer and image are seamless.

Values: 1 - 100

Default: 50

Merge Gradient (Ctrl - Alt - I)

   Will merge the gradient with the current image.   User specifies percentage of gradient to merge.   Maintains seamlessness IF: both the gradient and image are seamless.

Values: 1 - 100

Default: 50

Plasma Cloud (Ctrl - F4)

Plasma Cloud is a Random Midpoint Displacement Fractal.   I toyed with making it use the Pen and Brush colors, but gave up on that.   It's always randomly generated, so you'll never get the same thing twice.   User input controls the graininess.   Smaller numbers is a smoother cloud.

To get some color into your cloud, you can use <u>Tint</u>.

A better method (IMHO) is to use the XOR pen and draw a line that covers the entire image. Assuming your image is 256 x 256, set the pen size to 300, select the line tool, make the pen color something other than black or white, and draw a line that covers the entire image. This will give you a two-color cloud.   Or, use a merge pen to get a single color into the image.

Values: 1 - 1000

Default: 700

Paste Options

Besides pasting from the clipboard in the traditional way, HarmWave will allow pasting:

As a Selection
Transparent

When you use the Paste As Selection option, the clipboard image is placed on the image at the upper left corner.   When you pass the mouse over the pasted part, the cursor turns into a pointing hand.   You can then drag the selection to the desired location, and releasing the mouse completes the operation.   While the selection is being dragged around on the image, the X and Y coordinates of the upper left corner will be reflected in the title bar.   This is useful for precise placement of a selection.

Paste transparent will invoke a <u>dialog</u> where you can specify the color to use as the transparent color (in the clipboard image).   It can be the lower left pixel, the current Pen color, or a color of your choosing.   When custom color is chosen, you can click on the color square to bring up the color dialog.   By default, the image will be resized prior to pasting to match the current image size.   If this behavior is not desired, uncheck that option prior to completing the operation.   The clipboard image will then be pasted into the upper left corner of the current image.
Any areas of the clipboard image that match the transparent color will then allow the current image to show through.

For normal Copy/Paste/Undo, HarmWave uses the traditional shortcut keys of Ctrl+C, Ctrl+V, and Ctrl+Z.

Pen

Under the Pen menu, there is a long list of Pen types to choose from.   These are stock Windows pens, and I haven't quite figured out how they all work exactly....

The pen mode is only used when the <u>drawing tool</u> is the Paint Brush or the Line Tool.   For ellipses and rectangles, it is ignored (normal pen mode is used).

The available pen modes are:

- Normal
- MaskNotPen
- MaskPen
- MaskPenNot
- MergeNotPen
- MergePen
- MergePenNot
- NotCopyPen
- NotMaskPen
- NotMergePen
- NotXORPen
- XORPen

You can experiment with these to see what they do.   Some pens produce odd behavior when using the Paint Brush tool, like the XOR pen - it keeps changing itself back to the original color.   Now, this can produce an interesting effect, but it makes it difficult to apply the pen evenly to the image.

I often will select the XOR pen, then set the pen size to something bigger than the image height, and use the Line Tool to do the drawing.   This applies the pen evenly to the image. (For example)

To get a nice Windows type of clouds picture, draw a <u>Plasma Cloud</u> (it's always grayscale). Assuming your image is the default 256 X 256, set the pen size to 300, select the line tool, set the pen to Merge Pen, and make the pen color Aqua (Red=0, Green=255, Blue=255). Draw a line that covers the entire image.   White clouds in a blue sky!

Image Menu

From the Image menu item, there are several sub-menu items, as well as the Test Wallpaper item.

Doing a Test Wallpaper (Alt - I - T) will:

- Save the current image in the Windows directory as HarmWave.bmp.
- Set HarmWave.bmp as the windows wallpaper.
- Minimize all top-level windows so you can get a good look at it.

NOTE - This doesn't work if you are using Active Desktop.   It also assumes you have set your wallpaper options to 'tile'.

There are two options for seamlessness:

- 4 Way Flip - this makes three additional copies of the image and flips them so the edges abut.   It makes the image twice as big.   Use smooth resize to shrink it back to the original size.
- Edge Merge - This copies a portion of the opposite sides and blends them into the right and bottom.

The edge merge will copy 1/4, 1/8, or 1/16 of the opposite side.

These are not foolproof methods.   It's easiest to start with a seamless image, then most of the effects will maintain it.

Create-A-Filter (Ctrl - F5)

This dialog allows you to specify values to apply to each pixel, and a divisor value.   This is how nearly all the filters work, and it's the basis of the 3x3 convolution.

Without going into a lengthy explanation;   each pixel in a 24-bit bitmap (used internally by HarmWave) has a separate value for each of the Red, Blue, and Green parts that make up the color.   Each of those can be 0 - 255.

The values in the 3x3 grid are applied to the pixels as follows:

Each of the Red values is multiplied by the value in the grid, then added together.   That number is divided by the divisor (DON'T USE ZERO as a divisor) to make a 'composite' Red value.   The resulting value is 'trimmed' so that it's between 0 and 255.

The same process is repeated for the Green and Blue values.   These 'composite' values then make up the color of the pixel (at the center of the grid).

For the most effective filters, use a formula something like this: Add all the numbers in the grid.   Choose a divisor that will yield a result of 1.   For example:

```
-1   0  -1
 0  -1   0
 2   0   2
```
 These add up to 1, so the divisor should be 1 to get a result of 1.

Another example:

```
 5  1  1
 1  0 -2
 1 -2 -2
```
These add up to 3, so use a divisor of 3 to get a result of 1.

   This is just a suggestion;   you can try other formulas to see what the result is.   In the preceding example, changing the divisor to 2 will still work, but it brightens the image. Changing the divisor to 4 darkens the image.

Gradient Designer

The Gradient Designer is invoked from the menu item or from the Draw branch of the treeview.   For the menu shortcut, use Alt - G - D.

It provides access to the size, colors, etc of the gradient.   The Begin Color is the top or left, or 'outside' color, while the End Color is the right, bottom, or 'inside' color.   The radial gradients also use the Angle value, to determine at what point on the 'circle' to begin the gradient drawing.   In the gradient designer, the gradient is shown full size.   Changes to any of the values are reflected immediately.

When the designer is invoked, it will size the gradient to match the current image size. Clicking the Begin or End Color buttons will bring up a standard color selection dialog.

As mentioned before these gradients look best when your system colors are high or true color.

Map Texture Dialog

This dialog is shown when the Map Texture effect is chosen. The first time it is used, it will copy the buffer image (if any) for use as the contrasting texture.

It will then 'remember' the last texture so you don't need to populate this each time.

It allows you to load a file for use as the texture image, or you can use the buffer image by clicking on that button. It automatically grayscales the image and resizes it.

Paste Transparent Dialog

This dialog is invoked when the Paste Transparent menu item is selected (Alt - E - P - T)

It's only available if the clipboard has a bitmap in it.

It allows selection of a color to be transparent;   the chosen color will not be pasted into the image with the rest of the clipboard image.

If the custom color radio button is selected, the color box is activated, and you can click to it to invoke the standard color selection dialog.

By default, the clipboard image is resized prior to pasting.   De-select the checkbox to change this.

Select Dialog

The Select dialog is invoked when the <u>Selection Tool</u> is used to select an area of the image.

It prompts for three possible (ok, four) actions:

Copy to Clipboard
Copy to Buffer
Crop to Selection

(or Cancel)

It will copy just the section enclosed by the selection rectangle, or crop to the are in the selection rectangle.

Using this will most likely destroy seamlessness. :)

Sizer Dialog

The sizer dialog is invoked for either a <u>smooth resize</u> or a <u>fast resize</u>.   It's a re-use dialog from another application.

It has some standard screen sizes, but will also let you resize the image to whatever you want via the custom size option.   It's pretty straight forward;   the first time it gets called, it fills in the width and height with the current image size.

Text Designer

When the <u>Text tool</u> is selected and you click on the image, the Text Designer is invoked.   It allows you to enter a string of text, select the font, choose a font color, font size, and font style.   When the Use Custom Color checkbox is checked, you can bring up the standard color dialog by clicking on the three-crayon button.

Please note that you are not restricted to the font sizes listed in the drop-down combobox. You can type in any value you want, and true-type fonts (I think) will adjust.

Clicking inside the White box (where it initially says HarmWave) will change to an edit box where you type in your text.   Multi-line text is not supported at this time.

When you click OK, your text is dropped on the image and attached itself to the mouse.   You must move it to the location you want and click to drop it there.   See the examples section for drop-shadow, outlines, etc.

Tint Dialog

This is the standard color selection dialog.   If you've never worked with this before, it's handy for finding the rgb values of a given color.

MultiColored Gradient

This is a bit involved, but once you've done it, it's easy.   You basically shrink the gradients, copy them, then paste them back as a selection.

1.   Design a gradient, VertCenter, use default blue colors.   Make it 256 wide by 128 high. Paste to image.
2.   Copy the image to the Clipboard.
3.   Do a fast resize to make the image 256 X 256.   (Ctl + Q)
4.   Paste the clipboard as a selection (Alt > E > P > S).   The smaller version of the gradient sits at the 0, 0 location.   Click on it to finish the paste operation.
5.   Copy the image to the buffer (Alt > B > C)
6.   Design a gradient, VertCenter again, change the To Color to Yellow or Red.   Make it 256 wide by 128 high.   Paste to image.
7.   Copy the image to the clipboard. (Ctl + C)
8.   Paste the buffer to the image (Alt > B > P).
9.   Do a mirror U/D (Ctl + M)
10. Paste the clipboard as a Selection (Alt + E + P + S).   Click on it to finish the paste operation.

   You now have a more colorful gradient to start distorting.   I usually copy the finished multicolor to the buffer.   You can make more than just the two different colors, of course, this was just to get you started.

Fast vs. Smooth Resize

One thing that is not intuitively obvious is the effect resizing has on an image. In the main document I mentioned this briefly under the HarmSwizzle distortion. Let's use the multi-color image from the previous example.

1. Paste the multicolor gradient to the image, if it's not already there.
2. Change the orientation so the bars go up/down. Use the Rotate90 (Ctl + Alt + X)
3. Here's a kind of shortcut using the keyboard, instead of scrolling the treeview: Do a SineWave L/R (Ctl + E). Then UnDo it (Ctl + Z). This leaves the User input exposed for that effect. Change the Peaks to 256 (assuming that's the height of the image) and the Height to 64. Make sure the Wrap and Use Peaks boxes are checked. Click on the Execute.
4. This produces a fuzzy loking image. Now, do a Seamless 4way Flip (Alt > I > S > F).
5. Now, we'll compare the quick resize with the smooth resize. Do the Quick resize first (Ctl + Q), back to a 256 X 256 image. It takes on an odd shape, kind of an inverse mirror thing. OK, Undo that operation (Ctl+Z) and try the smooth resize (Ctl + R) back to 256 X 256 again. This time, the image is more what you'd expect. The image comes back into clarity because of the loss of pixels that occurs when a resize is done.

Text Effect Examples

These are not so intuitive, here's a couple of examples that will get you started.

RAISED GOLD LETTERING
1.   Start with a black image.   (Ctl+K)
2.   Click the Text tool button to invoke the text designer.
3.   Type your text.   Increase the font size to somewhere in the 20's, and choose something like a Garamond font.   Make your text yellow.
4.   Put the text in the center of the image, then do a Negative to reverse colors (Ctl+N). You should now have a white image with blue text.
5.   Do a LaPlace Filter (Ctl+P).   Your text should now be outlined in yellow, on a black image.
6.   Copy it to the buffer (Alt > B > C).
7.   Undo the LaPlace Filter (Ctl+Z)
8.   Do a Find Edges (Ctl+Alt+F).   Your Text should now be a blurry yellow on black image.
9.   Merge the buffer with the image (Alt > B > M).
10. This should produce a raised text that looks golden.   You should soften it and brighten it to 'shine it up' some.

GRADIENT FILLED LETTERING
1.   Start with a black image (Ctl+K)
2.   Design the text, in some sort of bold font.   The bigger the better.   Any color except black.
3.   Center the text in the image.
4.   Choose the eyedropper tool, and click somewhere in your text to pick up the color.
5.   Copy the image to the clipboard (Ctl+C)
6.   Design the gradient, I like HorizCenter.   Paste it to the image (Alt > G > P)
7.   Paste Transparent (Alt > E > P > T).   Choose the Use Pen color as transparent color.

This will give you a gradient filled text on a black background.   You can take this a step further:

8.   Copy the image to the clipboard.   (Ctl+C)
9.   Assuming you used the HorizCenter gradient, paste it back into the image (Alt > G > P)
10. Rotate the image 90 degrees clockwise (Ctl+Alt+X)
11. Paste transparent (Alt > E > P > T).   This time, allow normal transparency (lower left pixel, which should be black).
12. You now have gradient text on a gradient background.   There may be some artifacts, depending on the font you used, and if you have the Plus! font smoothing on or not.

SHADOW TEXT
There's no trick to this, really.
Select the Text tool, and design a large font in a color other than the image color.   Click OK, and watch the X, Y position when you drop the text on the image.   Now do the same text in a different color, and again, watching the X, Y positions, place the text up and left by two or three pixels.   You can blur or soften the first text to make a soft shadow before placing the second text.

Text is hard to read if any distortions are applied, so I would recommend keeping the settings low for waves and twist, etc.
Filters work great, for the most part.

Texture Images

I have a couple of textures that I think work pretty well, here's a description of how I create them.   These will use a 256 x 256 image.

Texture #1
• Design the gradient: Default blue colors, Radial2, with an Angle of 0.
• Rotate Seamless (Ctrl - Alt - S)
• Sinewave U/D.   Use these settings: Peaks= 2, Height = 120, wrap and use peaks both checked.
• Rotate 90 (Ctrl - Alt - X)
• Sinewave U/D.   Use same settings.
• OK, now just Lighten (Ctrl - Alt - T), Brighten (Ctrl - B), and Soften Less (Ctrl - Y).
• Save it to the buffer (Alt > B > C)

Create an image, it works best with medium colors (not too dark or light), then map the texture (Ctrl - F2).   Use the buffer as texture.

Texture #2
• Design the gradient: Default blue colors, Vertical.
• Do a seamless edge merge of 1/8:   (Alt - I - S - M - 8)
• Do a couple of Lightens and a brighten, and a soften less: (Ctrl - Alt - T), (Ctrl - B), (Ctrl - Y)
• Do a sinewave U/D with settings: Peaks=2, Height = 90
• Do a sinewave U/D with settings: Peaks= 4, Height =120
• Soften Less (Ctrl - Y)
• Copy to buffer (Alt > B > C)

Programmers Notes

I spent a lot of time developing this application.   I learned a lot while putting it together, and it's a 'work in progress'.   I hope to keep adding effects and tools as I learn more things.

I am making the source code available to those who are interested.   I hope people can learn things from looking at the source code.   As the application has grown, it has gotten a bit difficult to read.   I intend to eventually split out some of the effects into separate units, instead of piling it all into one giant main unit.

I used Delphi 4 Pro for the most part, because of its improved IDE.   However, I also made it D3 compliant, by adding conditionals in a few places.   I resisted the temptation to use the new D4 dynamic array, and used a work around so it could compile with D3.   The dynamic array is used in the plasma and marble routines.

Delphi 3 produces a much smaller executable, so my final build was done using D3.

I 'borrowed' a lot of code from others work, but not outright plagiarism.   I hope to someday convert from using TBitmaps to TFastBMP.   I use the scanline property extensively, which is very fast, but TFastBMP is even faster.   The sinewave routines were of my own devisement, through research and study and hit/miss.   One of the nice things about Delphi is the quick compile time, you can experiment easily.   I converted some C code and Assembler code into Pascal, and made modifications to maintain seamlessness.

I program as a hobby, I'm not trying to make any money from this or any of my other work. My main interest is in graphics - if you have a graphics effect that you would like to share, I would love to see it.   You can always reach me by email at harmans@uswest.net, I try to check mail frequently.

I have no formal training, as you can tell by the interface design.   I just don't know how to make an elegant interface, with so many effects and different user settings.   If you have suggestions along those lines, I would be glad to listen.

I initially used a lot of dynamic TBitmaps.   You know, the old:

```
procedure TForm1.Foo(aval : integer);
var
  dynabit : TBitmap;
begin
  dynabit := TBitmap.Create;
  //Do a bunch of crap
  dynabit.Free;
end;
```

This caused out of resources.   I don't know why, other than it's something to do with TBitmap implementation.   That's why I declare all my TBitmaps up front, create them at form.create time, and then free them all at form.destroy time.   It just works better that way.

A lot of people don't think Inprise did a very good job of TBitmap implementation.   I don't know, but I never did much windows API programming so I am not that familiar with DIBs. That's why I eventually plan to convert to TFastBMP or UniDIB - I think they are a little more straight forward, and more reliable.

However, I have had pretty good success with TBitmap so far.

If you look at the code, you'll realize that I don't do much in the way of error handling.   I test my stuff to make sure it works, but then I rely on the user to use it in the way I intended.   If you try to do domething that I didn't code for, the program may crash.   I didn't try to make it idiot proof.   I have checked HarmWave for memory leaks and it seems to be pretty tight. The only thing it doesn't clean up is the clipboard.

Also, if you look at the code, you'll realize that I'm not kidding when I say that it's a mess. The main unit has gotten so huge, it's difficult to navigate around.   That's where D4 IDE helps.

I don't provide technical support, but if you can't figure out how I implemented something, I will try to answer your questions.

Thanks for your intereset in HarmWave, I hope you enjoy it!

<div align="center">

Harm, aka
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</div>

Credits

The <u>FishEye</u> and <u>Twist</u> transforms were translated and modified from Visual Basic code written by Rod Stephens. I also modified some of his code for the smooth resize and Rotate Angle. He's the author of 'Visual Basic Graphics Programming', a great resource (even if it is VB). I can only hope that he becomes enamored of Delphi and decides to write a book for that platform.

The Color Noise and Spray effects came from authors that contributed to a Delphi unit called FastBMP, by Gordon Cowie III. FastBMP is an <u>excellent</u> free tool.

The Gradient Bars is an adaptation from a newsgroup post by (I think) Bjoern Ischo. I'm still waiting for his article in the UNDU newsletter.

The Help file was created using Helper by Kenneth Rochel de Camargo Jr.

All other effects and filters are mine (Harm).