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Super 3-D Genius

What is Super 3-D Genius?

Super 3-D Genius is a powerful new way to quickly create 3-D artwork for lenticular or barrier images. It not only creates the 3-D art, it instantly produces the finished interlaced image to your specified size to be viewed with a specified linescreen. **Super 3-D Genius** can also create continuously varying or fully rounded depth, 3-D animations, and 3-D flip images. **Super 3-D Genius** has a built-in composition previewer which shows how your composition will look in 3-D using red/blue glasses or interlaced shutter glasses. **Super 3-D Genius** uses new slice and dice technology which produces blazingly fast processing in very little memory when using tiff files. Even large GB size files can be processed and created without relying on slow virtual memory. **Super 3-D Genius** busts through the 32,000 pixel dimension limit and can create super large images up to 4 GB in compressed size. Even larger images, up to 16 GB, can be created by outputting color separations. New resampling and proprietary optical compression image enhancement allow you to produce the highest quality output. It is simply the easiest most powerful way to produce spectacular 3-D from flat art.

What you do: You provide two or more images that represent different depth levels. For instance, a background, midground, and foreground image would create a lenticular image with 3 depth planes. There can be as many midground planes as you desire. You also provide a transparency mask for the midground and foreground images which defines the areas where you can see through to the background when the images are composited. There are three ways to provide a transparency mask: 1. defining a color, such as blue, to be transparent; 2. creating an alpha channel which holds the mask; or 3. creating a grayscale mask file. It is easy to set up variable transparency for special effects.

You can also create continuously varying or rounded depth by supplying a grayscale depth map. Continuously varying depth maps can be easily created using gradient fill tools in graphics programs. Special tools are provided inside **Super 3-D Genius** for producing multiple image 3-D flips and animations. Multiple objects can be animated in a 3-D scene.

What **Super 3-D Genius** does: **Super 3-D Genius** produces any number of virtual 3-D views from the input depth levels which are instantly interlaced to fit the linescreen and output size you specify. If necessary, you can produce and save the individual virtual 3-D views but this is rarely desirable.

Think of it this way: The flat input files you create are arranged background to foreground, one in front of the other, with some space between them. Part of each image, except the background image, is transparent. If you look at them straight on, you see a composite image with foreground objects obscuring parts of the background. In real life, your two eyes view the 3-dimensional array of images from two different angles. Each eye sees foreground objects obscuring different parts of the background. (Hold your finger up and look at it with each eye alone to see how the background shifts.) Our brain uses this parallax information to reconstruct the scene in 3-D. The more parallax shift between foreground and background, the more apparent depth.

Super 3-D Genius can also produce fully rounded continuously varying depth from a grayscale depth map. It can sandwich the rounded depth between two fixed layers or let it span the whole picture.

Super 3-D Genius gives you total control over the creation of the 3-D scene. A lenticular 3-D image works better if there are many two eye views. You determine how many views there are by setting the number of Output Views on the process screen. If you choose 9 Output Views, it is like creating views from 9 equally spaced cameras in front of your array of depth layers. You control how ☐ deep ☐ the scene appears by setting the total parallax shift. Increasing the parallax shift is like increasing the distance between each of the depth levels. You can also control how much of the scene appears in front of the physical lenticular and how much appears behind the surface by adjusting the forward and rear shift. You can precisely position each depth level on the *transparency screen*.

Usually more output views are better, but this will depend on the resolution of your output device, the lenticular lens, and the viewing distance. It may require some trial and error to optimize the forward and rear parallax shift/depth for each image. A good place to start is 12 output views with a forward shift of 0.2 inches and a rear shift of 0.3 inches.

Super 3-D Genius can create and interlace multiple 3-D scenes at one time to automatically make a two, three, or

more 3-D flip image or 3-D animation. It also allows objects to be animated within any 3-D scene.

It is much faster to directly create the final interlaced image without actually generating and saving the intermediate 3-D views. However, **Super 3-D Genius** can create and save the intermediate output views if necessary. These images can be worked on and then loaded into **Super Flip!** to be interlaced.

New in version 4 Very large output image files, up to 4 GB, can now be created either compressed or uncompressed. Some tiff readers in other software and RIPS cannot reliably handle tiffs larger than 2 GB, so to be safe, you might want to limit your image size to 2 GB. For those situations where this is still too small, version 4 allows you to output RGB or CMYK color separations, each layer of which can be 4 GB (or 2 GB for some software). This can make compressed images of up to 16 GB. This feature is set on the *Utilities/ Flip Options* screen. Another improvement allows the alignment marks to be made much thinner than before which can make the alignment easier and faster. This is set on the *Utilities/ Alignment settings* screen.

+\$#Preparing the Images and Masks

Graphics files can be gif, jpeg, RGB tiff, CMYK tiff, bmp, png, targa, or pcx. **Super 3-D Genius** is optimized for the tiff file type. It will run faster and use memory more efficiently with tiff files, so it is a good idea to use tiffs where possible. The images will be composited like a □blue screen□ effect in the movies. That is, the subject or text that will appear at a certain level is surrounded by a single color (blue screen) or a mask that will be transparent when the images are composited background to foreground.

There are 3 ways to provide the transparency mask. A color, the default is black, can be specified for each file. A selected area can be saved as an alpha channel of a RGB tiff image. Or, the selected area can be saved as an 8-bit mask file that has the same name as the file it refers to with the addition of □mask.filetype. For example, the mask file for midground2.tif would be called midground2-mask.tif or midground2-mask.gif. For alpha channel or mask files, white defines the blocked region and black is the subject area, where the mask is transparent. The image is projected through the mask onto the background.

An easy way to make a mask in Photoshop is to use the selection tools to mark the area of the image that should be transparent. On the Select menu choose Save Selection. If your file is a RGB tiff, then you can select Save As New Channel to save the mask as an alpha channel. Or, select New and name the mask file the same as the image file with the extension □mask. Change the mode to gray scale and save the file.

Mask files must be in the same directory as the corresponding image file and should be 1 to 8-bit indexed color or gray scale files. Alpha channel masks will only work with RGB tiff images. CMYK files require -mask files. If a mask file or alpha channel unexpectedly masks out the whole image, check to see whether the black areas are really black (0,0,0) and not a shade of gray that looks black. Some programs change black 0,0,0 to 1,1,1 when certain file types are saved. Recolor them black if necessary.

Super 3-D Genius supports variable transparency masks. The gray-scale value of the mask at any location determines the transparency with 255 white opaque, 128 gray 50% transparent, and 0 black transparent.

Warning: Some graphics programs like Photoshop sometimes add a □halo□ of a different color around an object that might effect the color subtraction or the selection region for a mask. For example, you might set up red text on a blue background and think that the image has only two colors. If you blow up the region showing the border between the text and the background, you might find that another color intermediate between red and blue has been added. If you use blue as the mask color, it will not subtract this intermediate color which will appear as a fuzzy border around your clipped subject. You may have to recolor these border pixels. If you use a mask you can modify/retract the mask by one or two pixels.

Variable Depth files

A flat image can be mapped to continuously varying depth levels by creating a grayscale □depth file for the image file. This file, typically made with a gradient fill tool, codes the depth level of an image pixel as a gray level with black being the lowest background level and white being the highest foreground level. As an example, a linear gradient fill with black on the left to white on the right will create a variable depth plane which starts at the

background height on the left and rises to the foreground height on the right. **Super 3-D Genius** can rescale the grayscale depth maps on the fly to make the rounded depth appear between any depth levels you choose. This is a very powerful tool giving you the ability to place objects precisely in the third dimension. It also simplifies the making of the □depth files and makes them more versatile. Depth map files can be created for each object with the full range of gray scale from black to white, See the *Transparency and Depth screen* for more information.

A depth map file works best when there are no large discontinuous jumps in the depth levels. If there are, you may want to break the image into two images, each with a depth map that is a single surface. You can do this easily by changing the transparency masks for the images. From version 1.6 on the depth map is precisely aligned with associated image pixels.

The depth file has the same name as the associated image file with □depth appended, i.e. image3-depth.tif, must be exactly the same size, and must be in the same directory. **Super 3-D Genius** will automatically find the -depth files and default to variable depth. If one desires to ignore the -depth file and make the image appear as a flat level, this can be done on the *Transparency and Depth screen* by clicking off the variable depth control.

The □depth file is used with the transparency -mask file, alpha channel, or mask color to determine which parts of the image appear at which depth. All viewable pixels of a variable depth file overwrite pixels of earlier loaded files and are overwritten by files loaded later. This can create a conflict if the variable height image has to go behind objects of lower depth and then in front of them, such as a hula hoop around a person. Part of the hoop goes behind the person and part in front. The solution is to break the hoop into two images, the back part loaded before the person and the front of the hoop loaded after the person. The same image file and depth file can be renamed and used. Only the transparency mask needs to be slightly modified to select the lower and upper halves.

Image Size

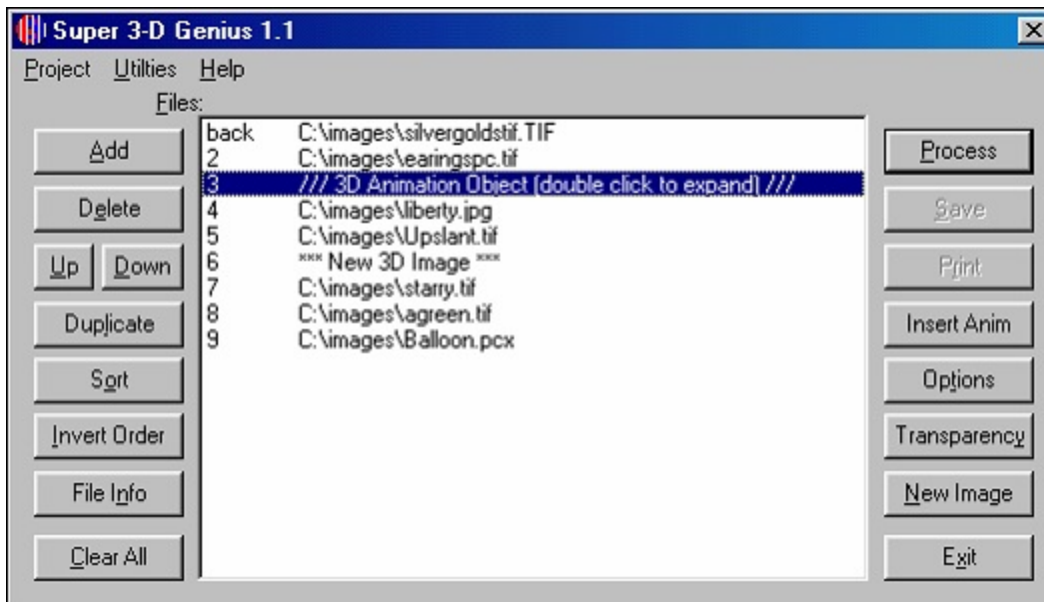
The creation of 3-D parallax requires that the images be shifted to the right or left and cropped. Because of this cropping, the original images must be wider than the final image by at least the maximum shift, forward or back (which you set on the process screen). Make sure that you include enough margin so your main subject or text does not get cropped.

CMYK Tiff Images

Super 3-D Genius will produce a CMYK output file if all your input files are CMYK tiff (except for any mask or depth files). The final interlaced file (and any intermediate view files) will be CMYK tiff. CMYK files can be saved and printed out from another graphics program. Masks for CMYK images should be prepared as □mask files. CMYK tiff files must not contain Alpha channels.

+\$#KLoad the Images

Load the files in order with the background first and then each depth level in sequence. The last file is the most foreground file. If an image file has an associated □mask file or □depth file, they must be in the same directory as the associated file. **Super 3-D Genius** will find these files automatically. They should not be loaded into the file list. Multiple files can be selected or dragged and dropped onto the **Super 3-D Genius** screen. Files can be rearranged with the up and down or sort buttons. The File Info button or double clicking on the file name brings up a window which has information about the file size and type and will show a thumbnail image of the file.

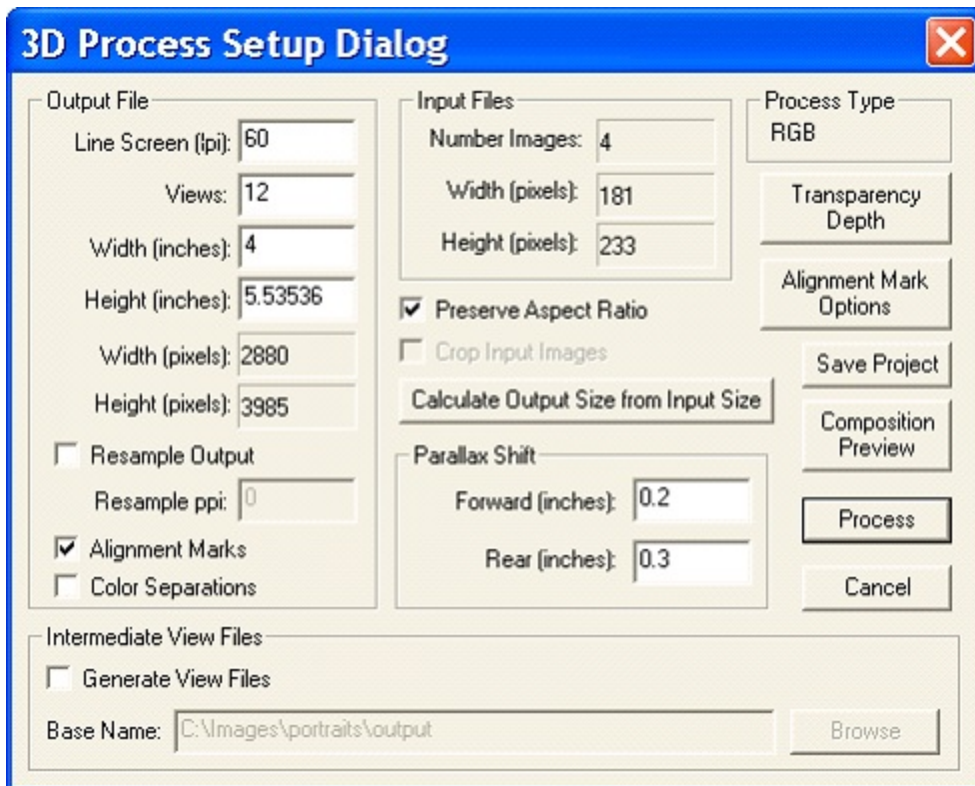


If you are creating a multiple image flip or animation, use the *New Image* button on the right hand side to mark the separation between the different images, then load the set of depth layers for the next image.

To animate an object in 3-D space, click on the *Insert Anim* button on the right hand side. This inserts a placeholder in the file list called *///3D Animation Object///*. To insert the frames of the animation, double-click on the placeholder or select the place holder and click on *File Info*. This brings up a new file list window for the animation frames. Each animation frame can have its own transparency mask and depth map. The number of frames in an animation should be less than the number of 3-D views being created.

+\$#K**Process the Images**

Hit the process button. If the images aren't all the same aspect ratio, you now decide whether you are going to stretch them to fit the output image dimensions, stretch them to fit the aspect ratio of the highlighted image file, or crop all the images to the smallest height and width dimension. Crop acts from the bottom left hand corner of the images. The Quick Crop option will show you six cropping options for each image..



The image shows a '3D Process Setup Dialog' window with a blue title bar and a close button (X) in the top right corner. The dialog is divided into several sections:

- Output File:** Contains input fields for 'Line Screen (lpi): 60', 'Views: 12', 'Width (inches): 4', 'Height (inches): 5.53536', 'Width (pixels): 2880', and 'Height (pixels): 3985'. There are checkboxes for 'Resample Output' (unchecked), 'Alignment Marks' (checked), and 'Color Separations' (unchecked). Below these is a 'Resample ppi:' field set to 0.
- Input Files:** Contains input fields for 'Number Images: 4', 'Width (pixels): 181', and 'Height (pixels): 233'. There are checkboxes for 'Preserve Aspect Ratio' (checked) and 'Crop Input Images' (unchecked). Below these is a button labeled 'Calculate Output Size from Input Size'.
- Process Type:** A dropdown menu set to 'RGB'.
- Transparency Depth:** A button.
- Alignment Mark Options:** A button.
- Parallax Shift:** Contains input fields for 'Forward (inches): 0.2' and 'Rear (inches): 0.3'.
- Intermediate View Files:** Contains a checkbox for 'Generate View Files' (unchecked) and a 'Base Name:' field with the text 'C:\Images\portraits\output'. A 'Browse' button is next to the field.
- Buttons:** On the right side, there are buttons for 'Save Project', 'Composition Preview', 'Process', and 'Cancel'.

The process dialog window is where you enter the number of 3-D views you want to create which will be interlaced. You also select the linescreen and the final output size here. The linescreen lpi should be accurate to within a few hundredths of a line per inch. If you are making a multiple image flip or animation, each flip will have the same number of intermediate 3-D views.

Next, select the total forward and rear parallax shift. Forward shifts cause image displacement that brings the foreground out in front of the screen. Rear shift is displacement that creates depth behind the screen. The default is to evenly space the depth levels between foreground and background but each level can be adjusted as desired on the *Transparency Options* screen. 0 forward shift puts all the depth levels from behind the screen to the screen surface. Visit the *Transparency* screen if you need to select masks or want to tweak the depth levels.

You can check your composition with the *Composition Preview* button on the right hand side of this screen. This produces a screen size version of your composition as either a grayscale red/blue 3-D anaglyph or an full-color interlaced image suitable for viewing with shutter glasses. You will need red/blue glasses or shutter glasses compatible with your monitor and video card to see the composition in 3-D. You can save the preview image by typing **□s□**. You can toggle the shutter glasses right/left synch by hitting **□t□**. Hitting any other key returns you to the program. You may need to increase or reduce the total parallax shift in order to see good 3-D on the screen. The preview is useful to check the composition and masking. You will not have exactly the same depth experience in the final lenticular or barrier as in the preview. For a multiple image 3-D or 3-D with animation you will have a choice of which flip image to preview and/or which frame of the animation to view.

To use the shutter glass preview feature, you will need a shutter glass system that triggers the glasses when the monitor is running in interlaced mode. Put your monitor in interlaced mode. This is usually done by selecting a refresh rate of about 45 Hz. You should notice a little flicker in horizontal lines on the screen and the triggering of the shutter glasses. Then launch the composition preview for shutter glasses.

When you are happy with the composition, hit the *Process* button and the interlaced output file will be generated.

You have the option to have alignment marks printed around the image. The Alignment Marks Options button on this screen will allow you to control the thickness of the alignment marks and exactly where they will appear around the image. You can also choose to resample the output image to a fixed resolution for your printer. Click the resample box and then enter the pixels per inch you desire in the final output file. Be aware that drastically resampling down can degrade the quality of your image and lose image information. If you desire an output file greater than 4 GB, you

can opt for color separations. Each color layer will be output as an 8-bit grayscale, each of which can be 4 GB. On the options screen you can invert the color separations if necessary.

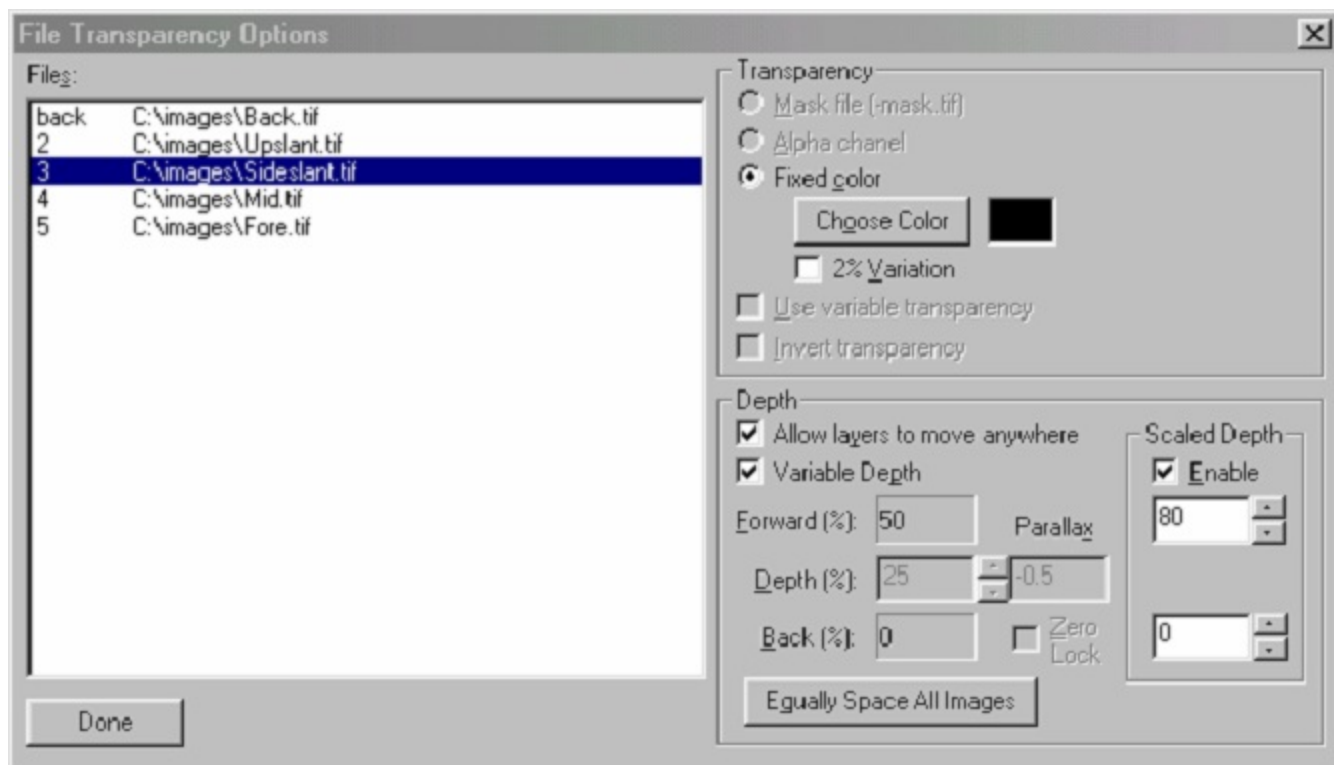
If you want to generate individual views files, set the base name for the multiple output files. Generating the intermediate view files significantly slows the processing of large files.

+\$#Transparency and Depth Screen

Select the transparency button on the *Process* screen. As you select each image except for the background image, you can now specify a transparent color, alpha channel, or mask file to determine the transparency of each image. **Super 3-D Genius** will automatically indicate if a mask file or alpha channel exists for each file when it is selected. If both exist, select which one to use. You can also select whether the mask for an image is to be interpreted as an 8 bit variable transparency mask.

When *Fixed Color* transparency is selected, the transparent color can be selected from the *Choose Color* screen. Black is the default transparent color if no color is selected. It is best to specify the exact color with its R G B value at the bottom right of the color window. Colors within 1% or 2% of the selected value will be transparent depending on whether the 2% box is checked. The color selected for each file is shown next to the *Choose Color* button.

If your selection mask is inverted you can fix it by checking the invert transparency box.



At the bottom of the screen, you can adjust the depth placement of each layer. The default is to evenly space the depth level between the two adjacent levels but the level can be set anywhere. The parallax shift for each level is shown and can be set directly. Positive parallax brings the layer in front of the screen. Zero parallax places the layer at the screen level. Negative parallax pushes the layer behind the screen. The part of the image around zero parallax will appear the sharpest. A layer can be set to zero parallax by entering 0 in the parallax box. Certain changes can move a layer off its setting; adding more files, changing the total parallax settings, etc. If you want to lock a layer down at zero, click the *zero lock* checkbox and the selected layer will be locked at zero. If a variable ☐ depth file exists for an input file, the *variable depth* box will be checked when that file is selected. The variable depth can be turned off by unchecking the *variable depth* box. That image will then appear as a flat layer at the depth level you set.

Normally, depth levels are constrained in depth by the levels in front of and in back of them. This is usually what you want so that objects in the foreground occlude objects behind them. In some cases though, you might desire to ☐punch a hole☐ in a forward layer with an object or text. Depth layers can be moved through the adjoining layers if

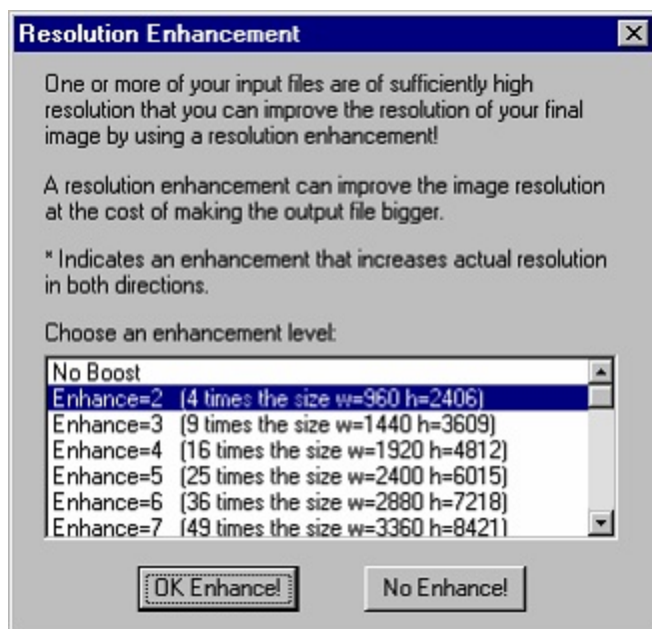
the *Allow layers to move anywhere* option is checked. (This can be set permanently on the options screen.) This effect can also be accomplished by providing a ☐ depth map file.

Another powerful tool is the *scaled depth enable* which can be used with ☐ depth maps. This allows you to create the depth map with the full range of gray values from black to white and then have it automatically rescaled to make the rounded depth appear between any two depth levels. By default, when you enable *scaled depth* for a depth map, the depth is rescaled so the image appears between the two nearest fixed depth levels. You can then use the scaled depth input boxes to adjust the depth levels within this layer, but you can ☐ use settings that take you beyond the adjacent fixed levels. However, if *Allow layers to move anywhere* is selected, you can adjust the depth levels to appear anywhere and you won't be constrained by the adjacent fixed levels. This feature used in conjunction with the composition preview makes setting the exact depth fast and easy. If the forward back values are reversed, the depth levels will be inverted.

Hit the *Done* button to get back to the process screen.

+\$#Resolution Enhancement

If **Super 3-D Genius** determines that the original input files have enough resolution to boost the resolution of the final output file, it will pop up the *Resolution Enhancement* screen giving you a choice of how much of a resolution enhancement to make. It will also inform you how much the enhancements will increase the file size.



Boosts which will enhance resolution in both directions will be indicated by asterisks. After that point, pixels are duplicated in one direction (usually vertically) in order to boost resolution in the other direction (usually horizontally). With the largest boost, every pixel from every input file is used. This is sometimes overkill and makes for file sizes and resolutions which are difficult to handle. Resolution enhancement uses a proprietary optical compression algorithm which effectively gives high resolution from moderate boosts.

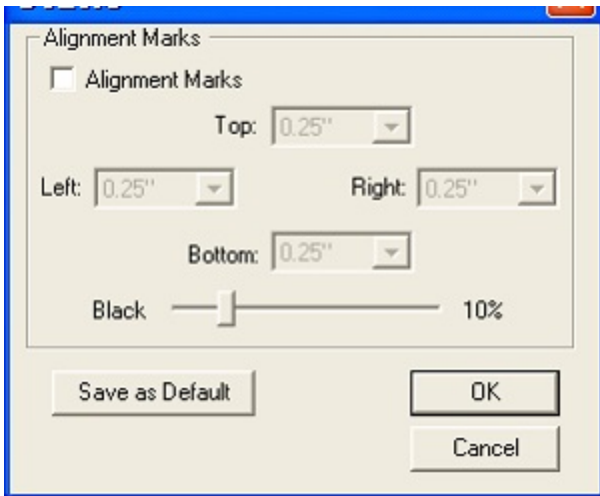
+\$#Utilities

Several useful tools exist in the *Utilities* menu. Here you will find a print tool, resample tool, change linescreen tool, screen pitch test and others. If an output file was just made, the print tool will automatically prepare to print it. It is possible to print the file with a different linescreen setting without remaking or altering the output file. This allows

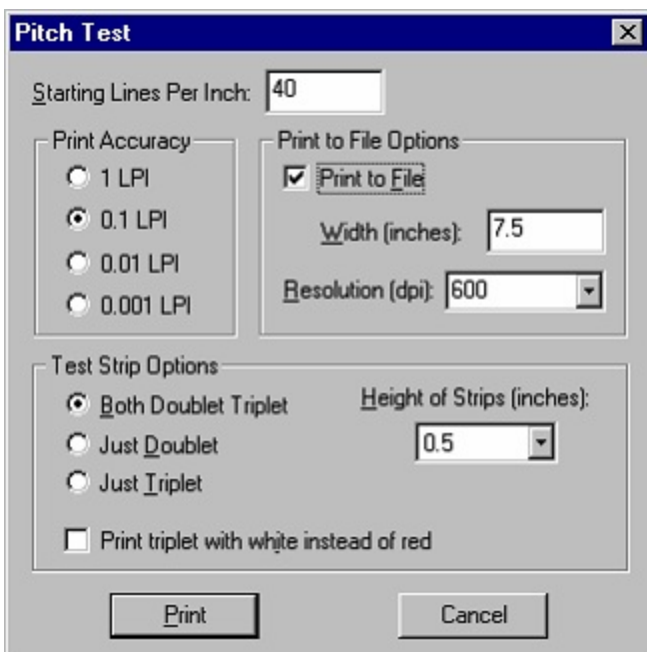
you to quickly check the effect of small linescreen lpi changes on your actual image. You can also use the *adjust file linescreen* tool to instantly write a new linescreen lpi into a file created by **Super 3-D Genius** without having to completely read and write the file. You can also resample the output file for a fixed resolution more compatible with a particular printer.

Projects can be named and saved from the *Project* menu and from the *Save Project* buttons on process screens. **Super 3-D Genius** will remember the files used and most of the depth, color, and size settings when a project is loaded.

Many of **Super 3-D Genius**'s default values can be set on the options screens which are reachable from the *Utilities* pull-down menu. Depth, linescreen, inches or cm, output size, save options, etc. defaults can all be set there. You can customize the alignment marks in *Alignment Settings*. The *Black* slider controls the width of the alignment marks and can go from a minimum of one image line to 50% of a lenticule.



Super 3-D Genius will print a screen test to help you determine the exact linescreen lpi. The screen test will print 10 test grids which differ by 1, 0.1, 0.01, or 0.001 lpi, allowing you to determine the best linescreen setting. This screen would create a test which would show 40.20 lpi, 40.21, 40.22, &, 40.29, and 40.3. Normally, **Super 3-D Genius** will print each pitch as a black and white pair and a black, red, white triplet. This allows finer calibration of the grid. Optionally, you can have the triplet printed as 2/3 white and 1/3 black, only the triplet, or only the black and white pair. You can also control the height of the test strips.



It is most accurate and faster to print the pitch test directly to the printer. If this does not work with your

printer or RIP configuration, select the print to file option and save the pitch test as a tiff file. You can select the width of the pitch test and the resolution for the file. You can enter custom printer resolutions in the resolution input box.

If the black line in the triplet is not directly under the black line in the doublet all across the page as it is on the left hand side of the page, then the triplet test may not be accurate for that lpi setting. This is due to the finite printer resolution.

Be careful using the pitch test. The results may change as you view the screen at different distances or in different lighting.

From the options menu you can also reach some input and output calculator screens that will help you calculate file sizes and resolutions. These are optional and not required to run the program.

+\$#K Troubleshooting

Masks--Mask files must be in the same directory as the corresponding image file and should be 1 to 8-bit gray scale files. Mask files have the same base name as the corresponding file with the addition of ☐mask. Alpha channel masks will only work with RGB tiff images

CMYK tiff files should not have an alpha channel or they will not be processed correctly. An alpha channel color mask will only work with a RGB tiff image.

If a mask file or alpha channel unexpectedly masks out the whole image, check to see whether the black areas are really black and not a shade of gray. Recolor them black if necessary.

Fuzzy halos--Some graphics programs like Photoshop sometimes add a ☐halo☐ of a different color around an object that might effect the color subtraction or the selection region for a mask. For example, you might set up red text on a blue background and think that the image has only two colors. If you blow up the region showing the border between the text and the background, you might find that another color intermediate between red and blue has been added. If you use blue as the mask color, it will not subtract this intermediate color which will appear as a fuzzy border around your cropped subject. You may have to recolor these border pixels. If you use a mask you can modify/retract the mask by one or two pixels.

Can't open file☐If there is an error such as ☐LZW decode, not enough data scanline 120 (short 1 byte)☐, go back into the application that created the image and save it without any compression. **Super 3-D Genius** reads correctly compressed files, but some programs, including Photoshop, occasionally write nonstandard compressed files.

Files not read correctly☐Photoshop appears to write 8 bit bmp files that can't be read. Most other 8 bit bmp's read fine. In the worst case, you can always convert a file that can't be read to a 24 bit uncompressed tif or bmp file. These can always be read.

Printer pitch test--The pitch test is designed to work with most Win95/98/NT printer drivers but may not work for every printer or RIP configuration. You have the option to create a pitch test tiff file of any width and resolution if the direct print test doesn't work. If the black line in the triplet is not directly under the black line in the doublet all across the page as it is on the left hand side of the page, then the triplet test may not be accurate for that lpi setting. Be careful using the pitch test. The results may change as you view the screen at different distances or in different lighting.

Memory problems/Large file sizes---If there are any memory problems, convert input files to the tiff format. **Super 3-D Genius** is most efficient handling tiff files and can quickly process large files in very little memory without using any virtual memory.

Super 3-D Genius can process and create very large tiff files including files with pixel dimensions over 32,000 pixels. Many programs cannot handle files with over 32,000 pixels in any dimension. Only the latest versions of Photoshop can open these files and other graphics programs may report errors such as ☐version not supported☐ or ☐problem parsing the file☐. If you need to load the output file into these other programs, create a smaller file by using less

resolution enhancement, use fewer input files, or use **Super 3-D Genius** to resample the output resolution to make a smaller file.
