Synchronization Conflict

August is the busiest month. Isn't that what they say? Well, I'm saying it. We'll be following up on last issue's digital-formatting article with a generous contribution from Oleg Vorobyoff.

July Stereo Division Meeting

This month, the Special Competition was 'Performance' and judge Joan Field emphasized color and composition.

A Group
1st- *Spinout Evolution,* John Ballou
2nd- *White Praying Mantis,* John Ballou
HM- *Mexican Crafts Vendor,* Oleg Vorobyoff

Card Competition
1st- *Sisters Posing,* Barrie Bieler
2nd- *Arm Wrestler,* Mat Bergman
HM- *Crowd of Prows,* Mat Bergman

B Group
1st- *Floaters,* Jack Muzatko
2nd- *Getting the Angle,* Stephanie Blythe
3rd- *Pretty Front Yard,* Jack Muzatko
HM- *Mount Diablo Path,* Melinda Green
HM- *Market Street,* Jack Muzatko
HM- *Three Worlds,* Melinda Green

Special Competition
1st- *BART Musician,* Jack Muzatko
2nd- *Cheerleaders,* Jack Muzatko
3rd- *Street Performance,* Mat Bergman
HM- *Country and Western Group,* Oleg Vorobyoff
HM- *Fiery Performance,* Mat Bergman

Club News

Our monthly club meeting will be on Monday August 16 at 7:30pm, in the Mosaic Room at the Hacienda de los Flores in Moraga. In place of a Special Competition we will hold a Clinic, so bring in your 3D curiosities in addition to your regular competition entries!

Stereo Photo Maker Part 2 by Oleg Vorobyoff

In last month's Panoram Jim Johnston presented excellent step-by-step instructions for using Stereo Photo Maker (SPM). It is a fantastic program that every stereo photographer should be using. I'd like to point out some additional features and quirks of SPM. "*Inside baseball" comments are mainly for technically oriented Photoshop users.*

Easy Adjustment

The easy adjustment screen presents a red and cyan anaglyph version of a stereo pair. It has literally dozens of controls for tweaking your stereo pairs. It is not just for aligning them and setting the window. Among the controls are:

Show Grid checkbox
The grid lines let you see exactly where your subject matter lies relative to the window in all areas of the composition. It is also handy for checking horizontal alignment of subject matter at various parts of the stereo pair.
Inside baseball: Do not set the grid interval too finely or the grid will tend to lose touch with the window, that is, it will appear to pop in front of it or behind it, depending on the convergence of your eyes at that moment.
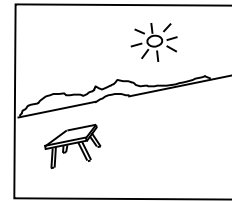
FIGURE 1
REPAIR OF TILTED STEREO PAIR

CHIPS AS VIEWED ON CAMERAS' LCD'S
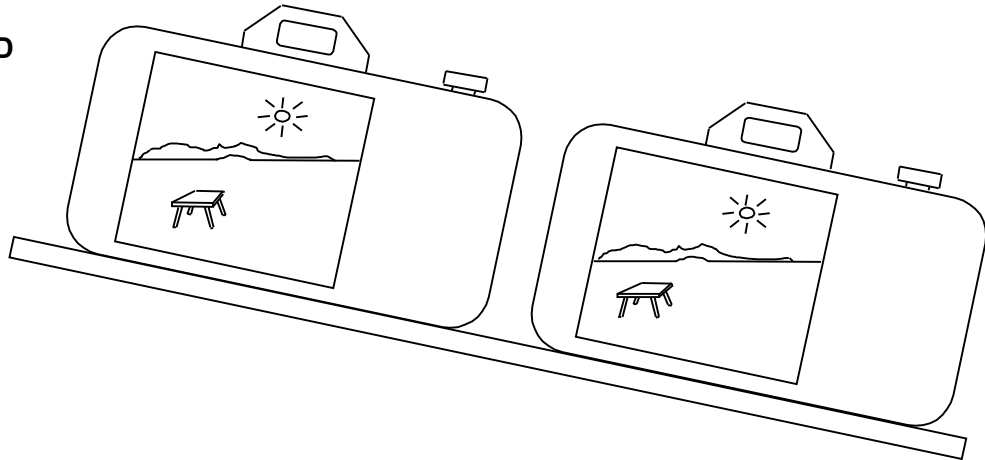
SAME CHIPS SEEN SQUARE
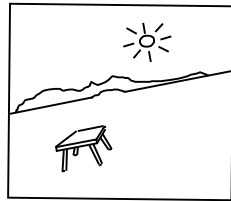
CHIPS TANDEM ROTATED
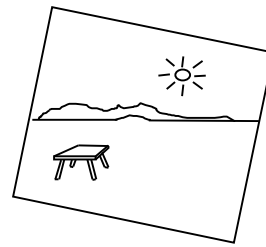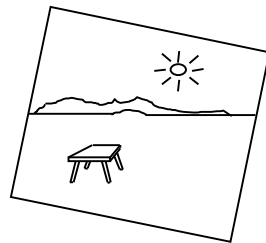
CHIPS TRIMMED (WINDOW AT INFINITY)

DISTANT POINTS ARE ALIGNED

NEAR POINTS ARE MISALIGNED
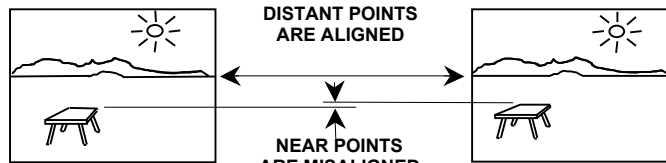
CHIPS FURTHER TRIMMED TO SET WINDOW

NEARBY SUBJECT MATTER IS FORESHORTENED

FREEVIEW THE STEREO PAIR TO CONFIRM THAT ISOLATED MISALIGNED AND FORESHORTENED SUBJECT MATTER IS NOT UNCOMFORTABLE TO VIEW IS NOT UNCOMFORTABLE TO VIEW

V position slider

The vertical position control is used for manual vertical alignment of the two chips making up the stereo pair. Take off the anaglyph glasses to do the alignment. Simply shift the red and cyan components of the image until they are in suitable vertical registration. I usually start by shifting some detail in the center of the image to the same horizontal level. If that causes the red and cyan components go out of vertical registration in other areas of the image it might be necessary to resize a chip, or to rotate one of them, or to do both. Manually aligning poorly matched chips can get frustrating. It is usually better to do a coarse manual adjustment and follow up with an auto alignment, as will be discussed later in this article.

Image Size slider

Unless you are shifting a single camera, the focal lengths of your lenses, thus the sizes of the left and right images, will be somewhat different. Auto alignment usually does a perfect resizing of your stereo pair. However, it upsizes one chip while downsizing the other. Upsizing should be avoided because it fills in by interpolation pixels that are not in the original file, which can lead to a fuzzier picture. For large discrepancies in size it is best to downsize only the larger chip manually using the image size controls. After getting details in center to the same level, downsize the appropriate chip until some detail at the top or bottom is also at the same level. You can then apply auto alignment to make the fine alignment. Again, use the image slider control with the naked eye, not wearing anaglyph glasses.

H position slider

This is the slider at the top of the screen that Jim recommended for setting the window. Actually, the auto alignment control does a good first cut at setting the window. But it places distant subject matter at a very conservative setting. If there is no important distant subject matter in the view it is often okay to set it behind where it can otherwise be comfortably viewed. You might want to do this to rescue a stereo pair taken with an excessive stereo base. On the other hand, a stereo pair with insufficient stereo base can look better with distant subject matter closer to the window than with the nominal setting. Furthermore, subject matter in anaglyphs will display less ghosting when close to the window. To find the best compromise the window should be set visually, wearing the anaglyph glasses. Proceed as follows. Set the slider to the right to until everything in the view appears behind the window. Then gradually slide it to the left until the nearby subject matter lies agreeably with respect to the window. Window violations (breaking the plane of the window) are sometimes called for, especially for anaglyphs. The slider is also useful without the anaglyph glasses for temporarily superimposing the red and cyan anaglyph images while using the V position slider. If you have already set the window, record the numerical setting of the horizontal position control before using it so that you can return it to its proper position.

Rotation sliders

Rotation of a chip is usually required for one camera cha-cha shots or for a stereo pair taken by cameras on separate tripods. Additionally, contrary to conventional wisdom, even a badly tilted stereo pair can be rescued by rotating the chips in tandem. First check the "link both rotations together" box. With the help of the grid use the image rotation controls to get either the central verticals straight up and down or the prominent horizontals level. The final result would be identical to shooting the original photo with camera or cameras leveled but with one lens mounted slightly lower than the other. Distant objects would appear at the same level on each chip. However, nearby subject matter in the "lower chip" will be slightly misaligned and foreshortened relative to "higher chip. The eyes can usually accommodate such localized vertical misalignment without discomfort. Refer to Figure 1 to see how the leveling procedure works.

Inside baseball: For a badly tilted stereo pair you might want to use Photoshop to reposition vertically some of the nearby subject matter on one of the chips, bringing it into better average alignment. Or you might want to eliminate the disparity in foreshortening altogether by distorting vertically the objects in question. For example, the height of objects towards the bottom of the "higher" chip may be reduced, equalizing the apparent foreshortening in the two chips. Since the closer subject matter in a typical composition is along the bottom, it is usually unnecessary to perform a similar correction in the upper reaches of the "lower" chip. Distant subject matter simply does not change significantly in proportions as the viewpoint is raised or lowered.

H_Pers (horizontal perspective) slider

In most cases converging verticals, either towards the sky or towards the ground, are not as objectionable in 3D as they might be in 2D. However, if certain subject matter is close to the window then aligning it with the window might be desirable. If that is the case, first set the lens focal length control to the 35mm equivalent of the original taking lens (or at appropriately longer focal length if the original image was cropped). Focal length is not a critical setting so a rough approximation is adequate. Then use the slider to bring the outer verticals into alignment with the window (or with outer grid lines).

Inside baseball: Horizontal perspective effectively means rotation about a horizontal axis through the middle of the chip. Vertical subject matter will thus appear in 3D to tilt slightly forwards or backward after the perspective correction is introduced. This effect may be counteracted in Photoshop using Image-Distort-Skew. Basically, one of the chips, or portion thereof, will need to be distorted into a parallelogram. The effect is too subtle to be set accurately looking at the stereo pair through a Pokescope. It will take some shuttling back and forth between Photoshop and SPM's anaglyph image to get the image looking truly vertical. Once it looks right, any redundant triangles on the ends of the parallelogram need to be trimmed off and the chips themselves trimmed to the same width as necessary.

V_pers (vertical perspective) slider

Converging horizontals are usually best as shot. However, if the composition incorporates some sort of rectangular framing it might look better if that framing is aligned with the window. Vertical perspective controls operate exactly like the horizontal perspective controls discussed in the previous paragraph except that the vertical controls operate on horizontal subject matter. Terminology confusing? Nothing to do but get used to it.

Inside baseball: Vertical perspective controls effectively rotate the image about a vertical axis, meaning that subject matter in originally a plane parallel to the window will no longer appear so. This may be corrected in Photoshop by selecting one of the chips, clicking Image-Transform-Free Transform and using a side handle to make the offending frame the same width as on the other chip. The chips themselves then need to be trimmed to the same width.

Barrel slider

Auto alignment or the perspective controls or the taking lenses can add barrel distortion to the image. With the help of the grid lines use the barrel distortion controls to make straight subject matter look straight. To make sure that you do not introduce retinal rivalry by using different settings between the two chips, check the "link both rotations together" box on the main screen before making adjustments.

OK checkbox

Before clicking OK make sure that all image size, perspective and barrel settings are as you want them. Applying these settings globally repixelates the file so yet another change in settings can seriously degrade the image. If additional changes are desired after clicking OK it is best first to undo the easy adjustment, reenter the original settings and then make the additional changes. Thus it is a good idea to record or save all settings before exiting easy adjustment.

Save and Restore(File) controls

These controls save your easy adjustments and enable you to retrieve them. Just don't forget where you put them.

SPM's Primary Controls

The main screen and menu bar also have very useful features as follows:

Undo and Redo icons

These are the controls I use most frequently both in SPM and Photoshop. They are handy for toggling between two versions of an image to test the effect of a modification. I only wish I did not have to hunt for the icons each time. There should be foot pedals like in an automobile for the task, the brake pedal for undo and the accelerator pedal for redo. Developers listening?

Auto Alignment icon

This tool does in seconds what might take hours in Photoshop. However, the auto alignment control sometimes gets confused and distorts the stereo pair instead. This will happen when there are no well defined subjects in large areas of the composition. Night shots are especially vulnerable. To set things right, undo the auto adjust and align the stereo pair manually in the easy adjustment screen. The image size, vertical position and horizontal position controls are the primary manual adjustment tools, though rotation and perspective controls might need to be used in some cases.

Edit-Crop control

This tool is superior to cropping in Photoshop because it resizes the chips in tandem rather than the stereo pair as a unit. I frequently shuttle between Photoshop and SPM for that reason. Contrary to conventional wisdom, I find that using JPEG files at least compression (highest quality) does not degrade the image no matter how often I resave the files. On the other hand, uncompressed TIFF files are totally mangled when sent to SPM from my Photoshop Elements 8. Go figure.

Edit-Resize dialog box

These controls are superior for stereo to those in Photoshop because they too resize the chips in tandem rather than the stereo pair as a whole. A simple way to get the stereo pair ready the club's projectors is to resize under the "keep aspect ratio" option to either 1280 pixels horizontal or 800 pixels vertical, whichever contains the image within the projector's 1280x800 native resolution. The file for the stereo pair will be twice the width of a chip, for example, it would be 2560 pixels wide for a full width stereo pair.

Edit-Sharpen dialog box
The size and perspective controls in the easy adjustment screen tend to smear the image. But they do not completely destroy the information embedded in the pixels. Sharpening reveals much of this hidden information. SPM's sharpening is not as sophisticated as Photoshop's but is fine for most purposes. SPM provides just one control: hardness on a scale of 0 to 64. Paradoxically, in revealing some information, sharpening obliterates other information. Which information is important depends on the subject matter and final image size. Therefore sharpening should only be applied as the last step before saving the final image. Proceed as follows. View the final image on the computer screen enlarged so you see about half a chip full screen. Apply, say, 64 units of sharpening. Toggle between undo and redo to compare the sharpened and unsharpened versions. If there is little difference, apply a second course of 64 units. If every part of the chip does look better sharpened, you probably have the right setting. On the other hand, if hard edges have a white halo, halve the hardness setting to 32. Repeat halving the setting until the image looks good.
Inside baseball: SPM applies sharpening globally, to the entire image. When applied to relatively smooth surfaces like sky and skin tones it tends to emphasize digital noise, that is, to add grain where there should be none. For critical applications, accordingly, it is better to apply the sharpening in Photoshop, where it can be targeted to selected areas. Alternatively, the SPM sharpened file could be sent to Photoshop where any offensive grain may be minimized using the blur tool.

Adjust-Auto Color Adjustment control
Jim said he liked this control. I do too, but often forget to use it. Remember to use it.
Inside baseball: Unmatched chips lead to all kinds of problems when making changes in Photoshop, especially those involving copying pixels from one chip to the other. Auto color adjustment puts you one step ahead in the battle.

Adjust-Color adjustment dialog box
The colors produced under standard camera settings are relatively subdued. So it is best to add about 20 units of SPM's saturation to both chips. Projectors tend to brighten the image and wash out the colors. So for projection it is best to remove, say, 10 units of lightness and to add even more saturation. Unfortunately, SPM's color controls relatively crude. Thus it is important to inspect the saturated image carefully for objectionably bright colors and to back off on the setting if necessary.
Inside baseball: Photoshop's color controls can add more saturation more smoothly. For projection it is also helpful to select the reds and give them a boost because they get particularly washed out. Just don't use the resulting file for printing, unless, of course, you like garish prints. SPM also has weak contrast controls. I found the gamma control useless for increasing contrast. It is better to go to Photoshop and see what its auto contrast control will do for the image.

About SPM

Stereo Photo Maker was developed and is maintained by a Japanese engineer, Masuji Suto. It was adapted for English speaking users by an American engineer, David Sykes. The whole thing was posted for free download on the internet. With the recent upsurge of interest in 3D, stereo enthusiasts and engineers throughout the world are using the software to view stereo and to develop new 3D applications. I only hope that the developers will receive compensation commensurate with the positive impact the program has made.