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Digital Photography

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Large Format Digital Infrared Photography with Betterlight Super 6K



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Contents

Introduction	3
IR Image Acquisition	4
Post Processing	5
Method 1: Lab lightness channel	5
Method No. 2 Channel Separation	7
Image analysis of both methods	8
White Balance	8
Polarizing IR images	8
Color IR Photography	11
Conclusions	12
Acknowledgments	13

Infrared Large Format Digital Photography with BetterLight Super 6K Trilinear Scan Back

By Edgar Eduardo Sacayón

Introduction

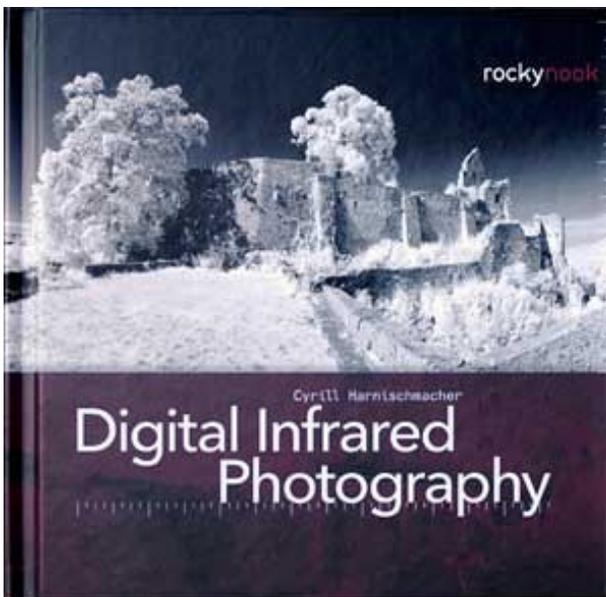
This report will discuss Infrared photography with BetterLight Super 6K trilinear scan back. The BetterLight system is sensitive to Infrared (IR) light in the range of 700-900nm of the light spectrum, making it appropriate to create fine art infrared photographs.

Today most DSLR cameras have an IR blocking filter on the CCD to block IR light. In order to do fine art IR photography IR filters can be used, Hoya and Heliopan manufacture IR filters that allow different wavelengths of the near IR spectrum, and block most of the visible light generating different effects in the image, post processing methods depend on type of filter used.



Figure 1. Betterlight Super 6K trilinear scan back and Cambo Ultima.0 large format camera.

Mike Collette is one of the pioneers in Large Format Digital Photography the BetterLight system is at the moment the only digital back for large format cameras that is readily available in North America and adjacent Latin America (other brands are available in Europe, as of course is also BetterLight. The scan back system has proven to be successful in art repro work, large resolution panoramic photography and rollout circumferential photography. Dr. Hellmuth has been a beta tester for BetterLight and has being doing rollout photography of Mayan polychrome vases.



For normal color photographs the BetterLight system uses a IR blocking filter, this can be easily removed making the camera sensitive to IR light and thus ideal for IR photography. J. Michael Sullivan is a photographer that uses the BetterLight system for fine art photography.

The world wide web offers a great deal of resources on IR photography but If you are really interested in perfecting this technique I would like to recommend the book by Cyrill Harnishmacher, which is quite enlightening and has motivated me to pursue this photographic technique. Rocky Nook publishes the book, and the price is quite accessible.

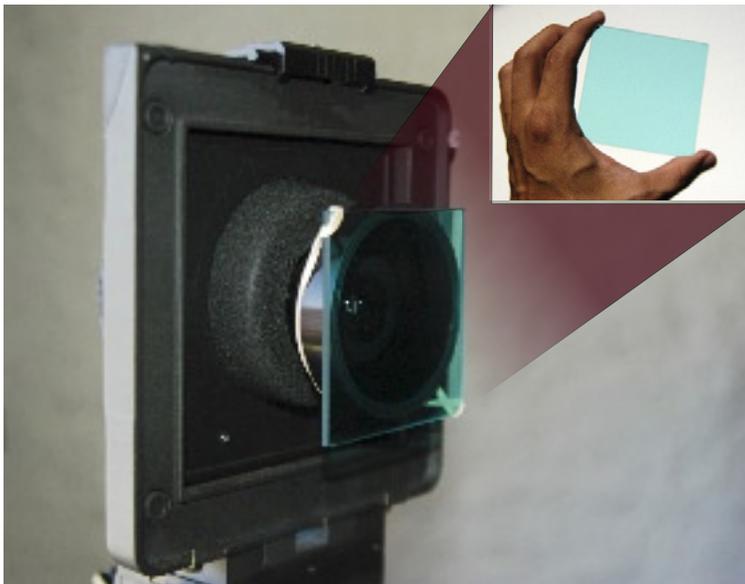


Figure 2. Infrared blocking filter on back part of the lens.

Figure 3. Infrared blocking filter removed.

IR Image Acquisition

The only step necessary for IR image acquisition with the BetterLight system is the removal of the IR blocking filter. We use a Cambo Ultima 4x5 inch large format camera. The trilinear scan back is placed in the film holder rear standard.

The original images were taken in one of our field trips to lake Atitlan in the Guatemalan highlands early in the morning to catch clear blue skies, a polarizing filter was used. After the normal color image was obtained the IR blocking filter was removed.

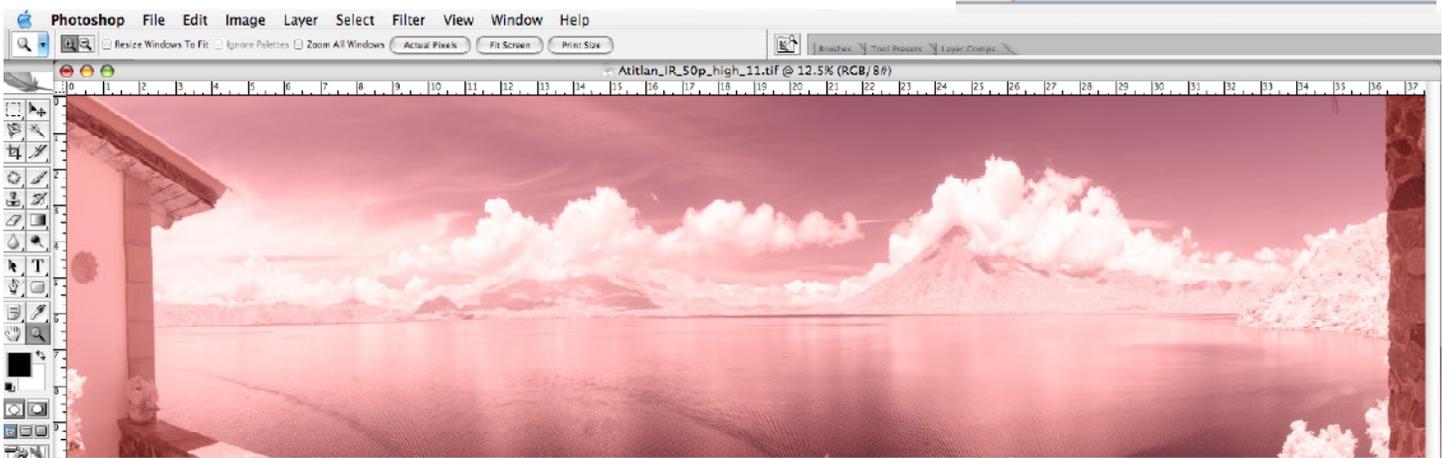
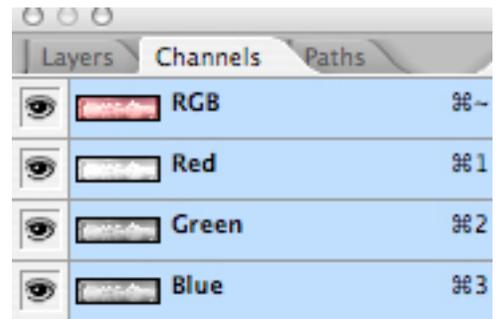


Figure 4. Original infrared image obtained from Betterlight.



Figure 5. Once the image is in Lab mode the Lightness channel is selected and the levels are adjusted.

Post Processing

The methods presented here are discussed openly on most of the web sites and are also described by Cyrill Harnischmacher's book *Digital Infrared Photography* (2008) we are thankful with Rocky Nook publishers for letting us review this book.

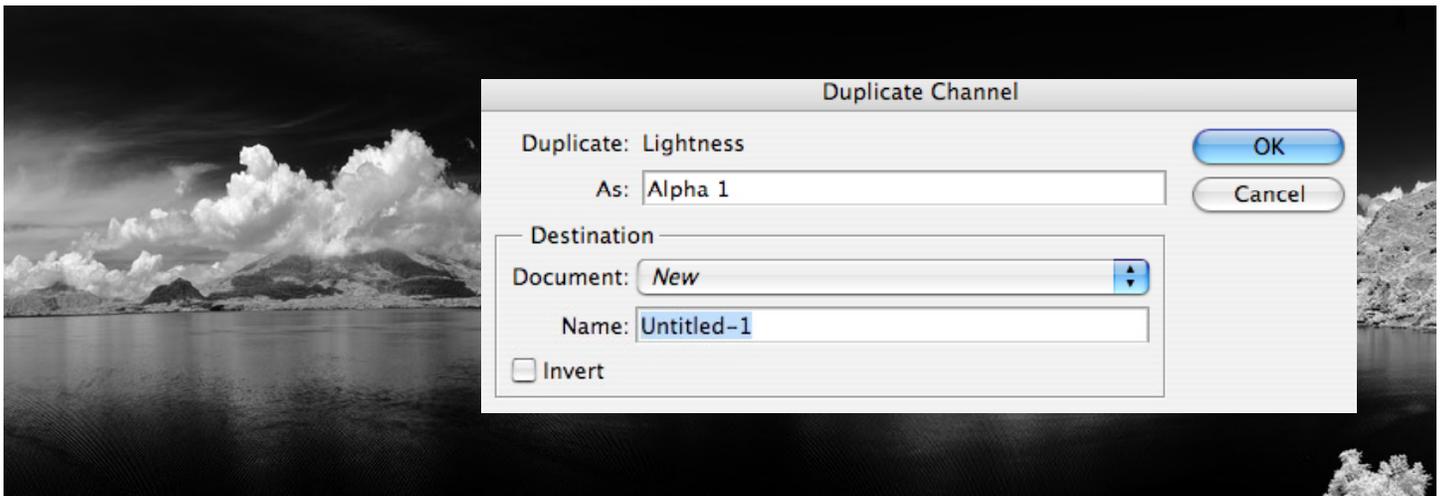
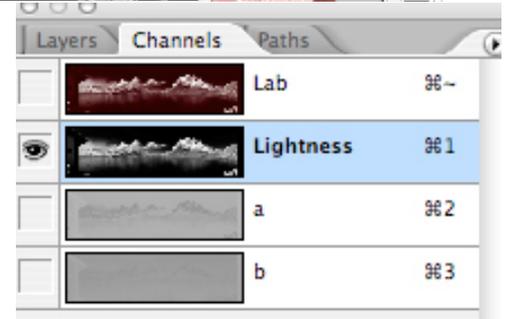


Figure 6. The channel can be duplicated to a new file using the duplicate command in the channels palette.

Method 1: Lab lightness channel

1. The original files is in RGB mode and must be transformed to the Lab color mode from the Adobe Photoshop Image/Mode menu. (Fig. 4.)
2. Once the image is in Lab mode the Lightness channel is selected and the levels are adjusted. (Figure 5)
3. The channel can be duplicated to a new file using the duplicate command in the channels palette. (Figure 6)

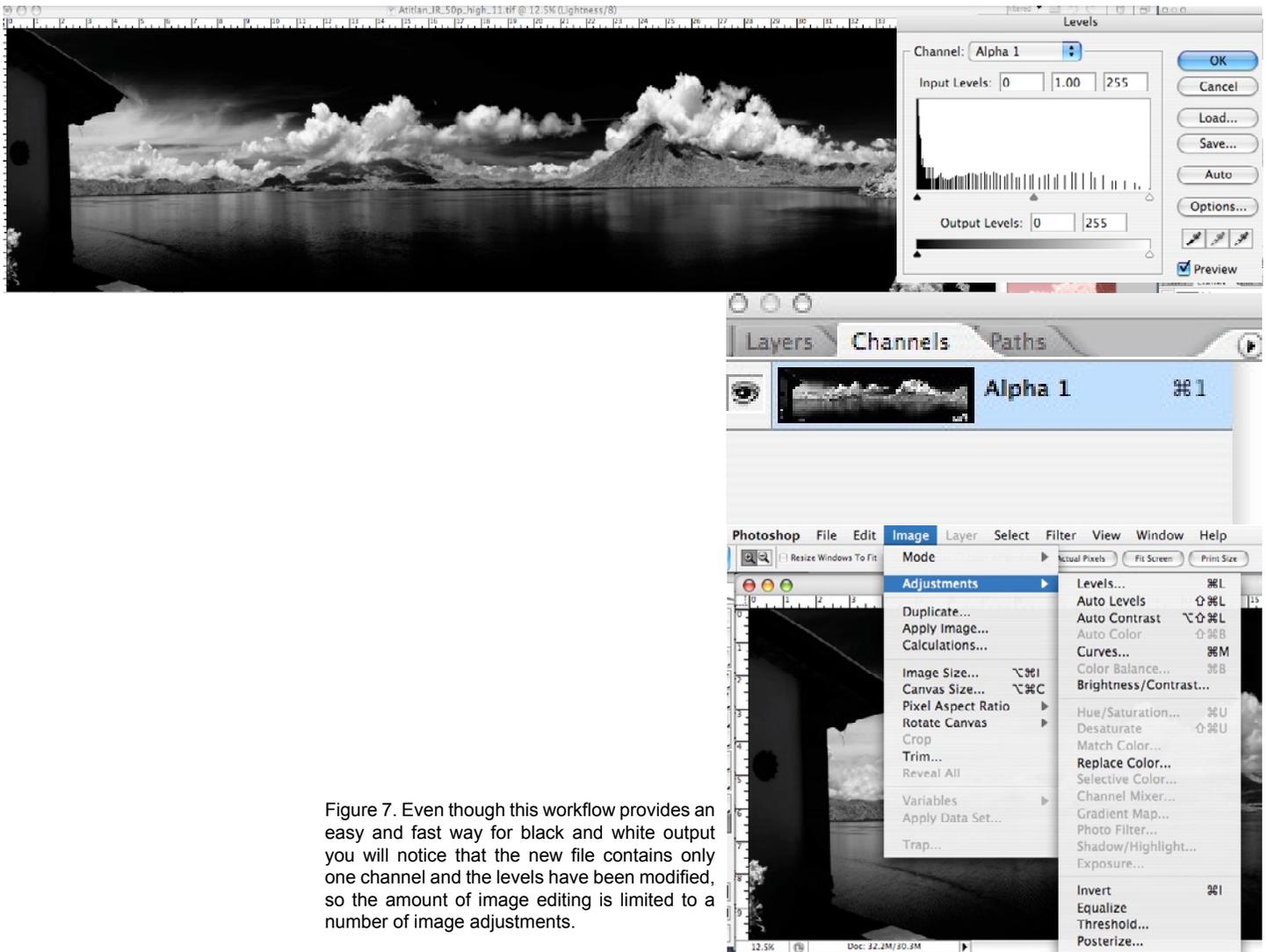


Figure 7. Even though this workflow provides an easy and fast way for black and white output you will notice that the new file contains only one channel and the levels have been modified, so the amount of image editing is limited to a number of image adjustments.



Figure 8. Final Image

4. Even though this workflow provides an easy and fast way for black and white output you will notice that the new file contains only one channel and the levels have been modified, so the amount of image editing is limited to a number of image adjustments. (see image adjustments image)

5. This workflow is specially good for pure B&W fine art photography. (figure 8)

Method No. 2 Channel Separation

1. The channel separation method provides an alternate way to convert a an IR image to B&W. The first step is to go to the channel palette and select “split channels” in channel palette menu.

2. The channels are separated into three different files, we used the green channel because it had a wider tonal range and notice that the red channel is overexposed.

3. The levels are then adjusted and a final B&W image is obtained.

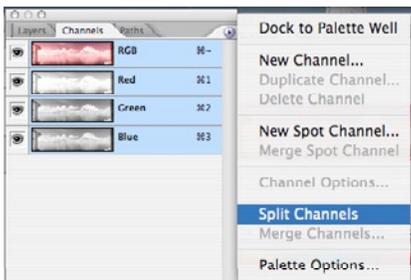
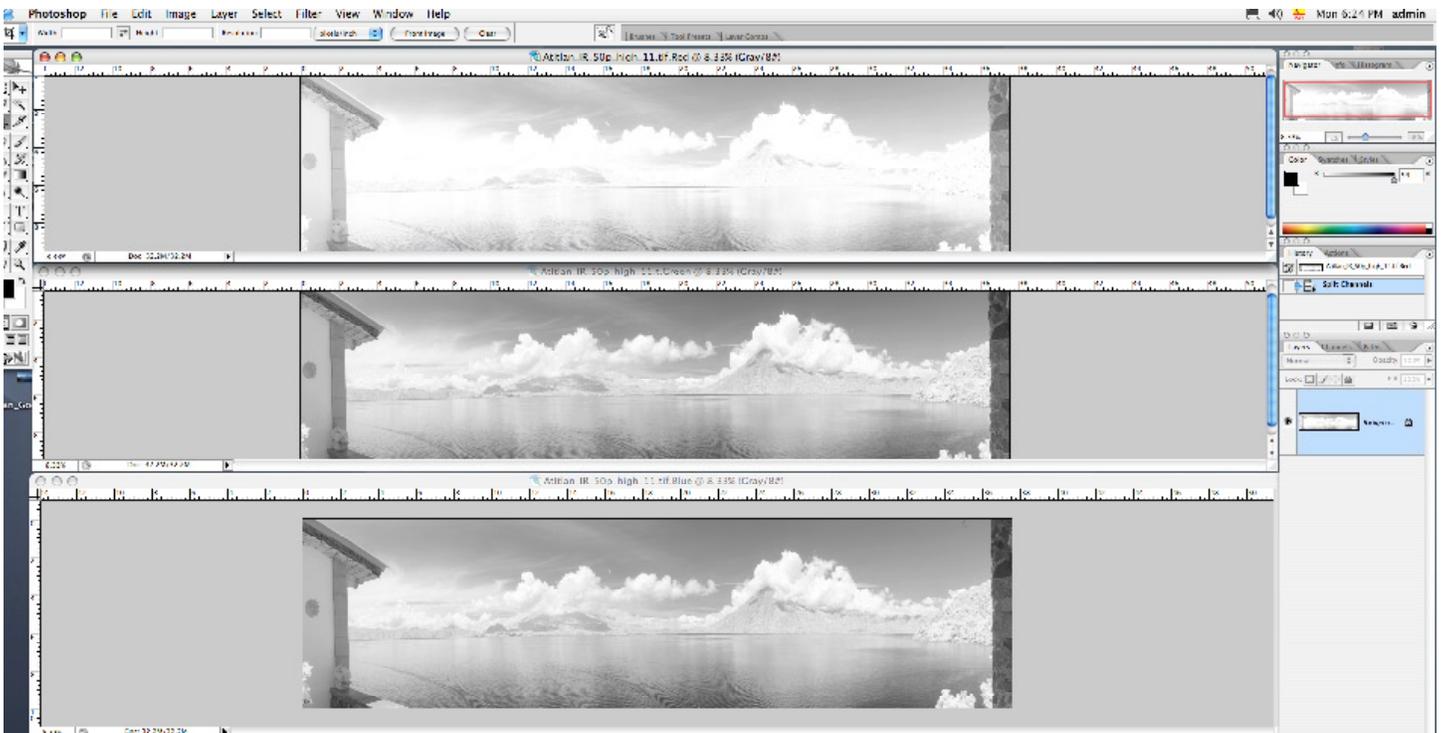


Figure 9. Split Channel command and resulting individuals channels.



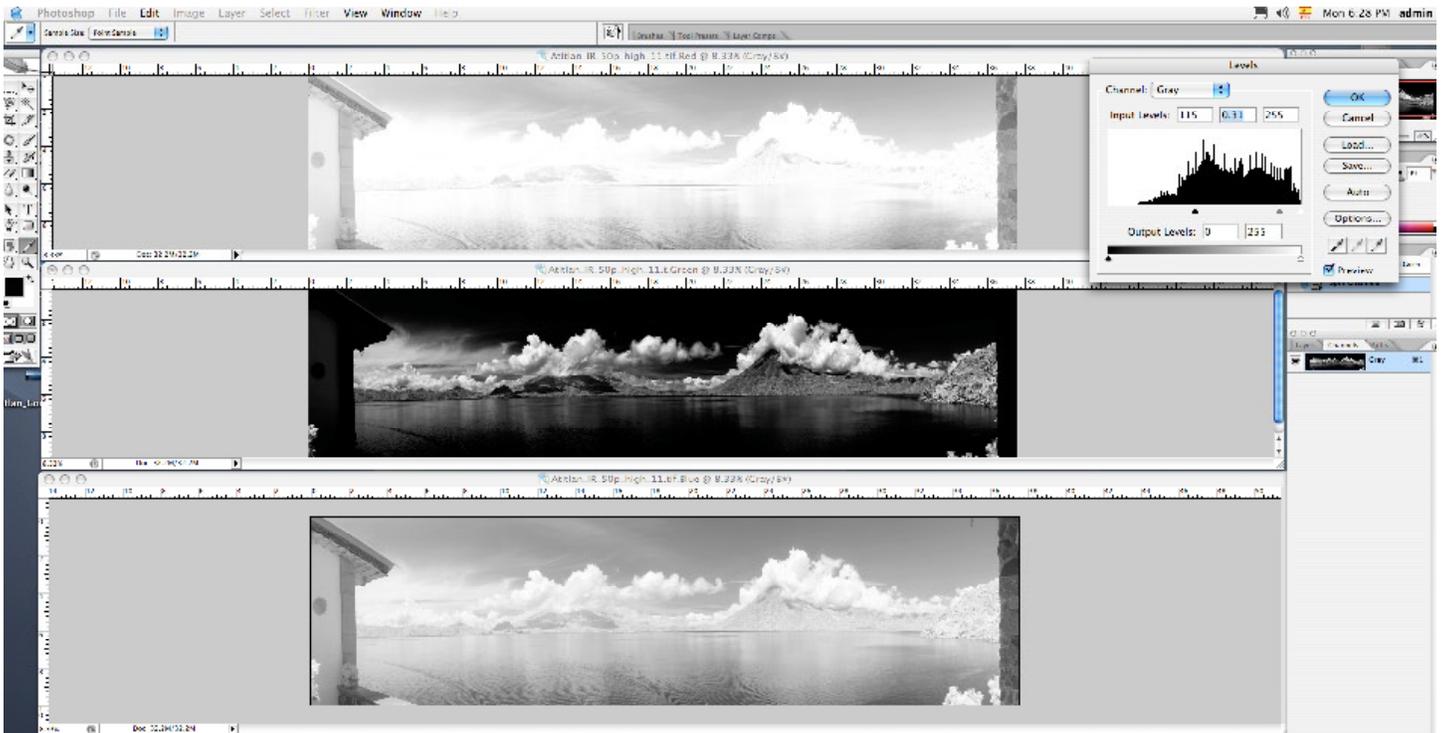


Figure 10. Level adjustments in the file containing the green channel

Image analysis of both methods

We compared both methods by zooming in the panoramic image from Lake Atitlan, and found no significant differences, we can say that for pure black and white IR images both of the post processing procedures can yield good results and good tonal range. (Figure 11 and 12)

White Balance

We evaluated the effects of white balance on IR images, the first one (Fig.13) was taken with the IR blocking filter and a automatic white balance was made within Viewfinder BetterLight software. The following images where taken without the IR blocking filter. (Fig.2 and Fig.3) All images where then transformed to black and white using the Lab channel method described earlier, to see the differences.

Polarizing IR images

In order to test the effect of a polarizing filter on IR photography we took a series of shots, with and without polarizing filters. All images where then transformed to black and white using the Lab channel method. (Figures 19-22)



Figure 11. Detail of the B&W IR Atitlan panoramic image created with the Lab Lightness Channel method



Figure 12. Detail of Image using the green channel separation method, notice there are no significant differences



Figure 13. Betterlight original color image with polarizing filter and automatic white balance.



Figure 14. B&W obtained from left normal color image.



Figure 15. This shot was made immediately after fig.13 was taken and only the IR blocking filter was removed. White balance was made on normal color image with polarizing filter.



Figure 16. B&W from left IR image.



Figure 17. Shot with polarizing filter and IR blocking filter removed. In this image the white balance was made on the IR image.



Figure 18. B&W from left white balanced IR image.



Figure 19. With polarizing Filter.



Figure 20. B&W with polarizing Filter.

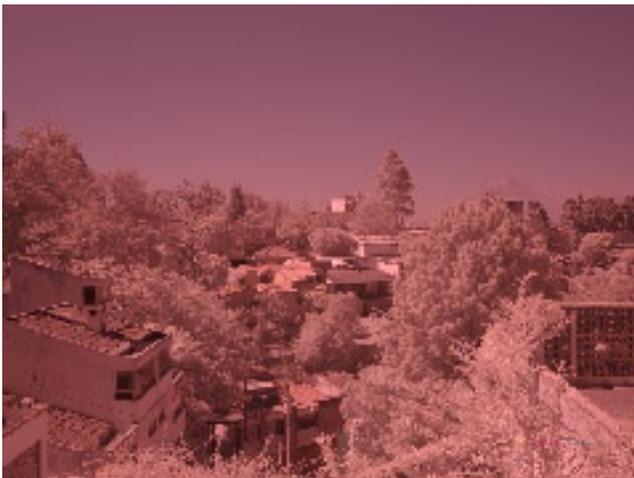


Figure 21. No polarizing filter



Figure 22. No polarizing filter

In my personal opinion the best result where obtained after the IR blocking filter was removed from a normal color balance using polarizing filter.

Color IR Photography

The technique referred to as color IR is the result of visible light passing through a IR filter, usually Hoya R72, Heliopan RG715 and RG665 filters are used for this technique. The post processing method involves the swapping of the color channels through the Channel Mixer tool in Adobe Photoshop, we will not go into details of this method since we feel the descriptions available refer to the type of filter used. (Figures 25 and 26)

Since the BetterLight does not use any filter for IR photography, several effects can be accomplished within the camera software just by making a white balance on the IR file. The results offer raw material that can be processed with the different tools in Adobe Photoshop. Experienced photographers will find useful the great possibilities this camera has to offer.



Figure 23. Detailed from image without polarizing filter and without any white balance. The arrow points to Volcano Agua, overlooking Antigua Guatemala, about 40 km away.



Figure 24. The image with polarizing filter and with the white balance adjusted in the color image before IR Blocking Filter removal.

Conclusions

The BetterLight trilinear scan back system offers great potential for pure black and white IR, color IR and fine art photography. The high quality and large resolution image files surpass any medium format or 35mm DSLR cameras.



Figure 25. IR Color Image



Figure 26. IR color Image with red and blue channel mixed with channel mixer tool in Photoshop CS2.

Acknowledgments

We would like to thank Mike Collette for providing technical support for our ongoing research of the BetterLight system that he kindly donated for review and evaluation.

If you would like to get more information on the BetterLight system please feel free to contact them at: info@betterlight.com

Also we would like to thank Rocky Nook publishers for their collection of books on digital photography, this have been very insightfull and have allowed us to developed new photographic techniques.