



Bishops Stortford Camera Club

Workshop Notes 10/01/2012

HDR From Cradle to Grave

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1. Introduction

The aim of this workshop is to take you through the steps I utilise when taking High Dynamic Range Images (HDR). I will be referring to the previous HDR workshops notes, from the workshop held on the 18/02/2011, which are available from the club website.

2. Software Utilised

The following software will be used tonight.

1. Lightroom
2. Adobe Bridge
3. Adobe Camera raw
4. Photmatix
5. Adobe Photoshop CS5
6. Topaz Adjust
7. Topaz Denoise

These packages are all available from the following web sites:

Lightroom, Adobe Bridge, Adobe Photoshop, Adobe Camera Raw
www.adobe.com

Photomatix Version 4 www.HDRSOFT.com

Topaz Adjust, Topaz Denoise www.topazlabs.com

Trial versions are available for download and use for a period of 30 Days.

3. Camera Equipment

1. Camera with the capability of Auto Bracketing Exposures
2. A sturdy tripod
3. A Cable release or Timer on the camera
4. A suitable lens to achieve the style of photograph you require.
 1. 10-20mm Wide Angle
 2. 18-55mm "Kit Lens"
5. Spirit Level to ensure that the camera is level on the tripod

4. Camera Settings

Aperture: When shooting hand-held choose the widest possible aperture.

If you are shooting from a tripod, you can use any aperture.

Sharpness: Everything should be sharp in your final image. This means that you require a wide Depth of Focus/Field (DOF). I try and use an aperture of at least f/8 for optimal sharpness. If you use an aperture smaller than f16 as the sharpness of your image will decrease due to diffraction.

Shutter Speed: It must be remembered that in low-light conditions using a low ISO sensitivity and small apertures will lead to very low shutter speeds.

Most DSLRs permit a “camera controlled” slowest shutter speed of 30 seconds.

You can only go beyond that by using the Bulb mode setting.

Thus, you need to make sure that the longest exposure stays below 30 seconds.

To do this, put your camera in aperture priority mode point, at your chosen aperture, at a medium-lit section of your scene and read the given shutter speed.

The value should not exceed 7 seconds since the +2EV exposure will be four times longer than the value you just measured.

If it is greater than 7 seconds, reduce the f-number and/or increase the ISO sensitivity.

However, increasing the ISO sensitivity is not to be recommended as it will introduce additional noise in your images.

Focus: Focus using the cameras autofocus system and then put the lens into manual focus mode before taking the picture. This will ensure that each image will have the same focus point, avoiding any problems in the stitching process.

Mirror lock-up mode: This ensures that the vibration caused by the mirror flipping up dies out before the shutter is opened. This also assists in taking sharp images.

Raw Mode: Activate the raw mode of the camera for maximum quality and to be able to freely modify the white balance in post-processing.

People in Science: Shutter speeds of several seconds will make moving people disappear or ghosted in your image.

In a 25 second exposure, a person walking through the frame at normal walking speed will be barely visible in the final image.

Starbursts: If you would like to have the light sources in the image appear as starbursts, you should use apertures between f/11 and f/16.

Auto Exposure Bracket Mode: Put your camera in AEB mode set at the following:

-2 EV (Under exposed)	- Detail in Highlights
0 EV (Correct Exposure)	- Normal Details
+2 EV (Over exposed)	-Detail in Shadows

These are the standard quoted exposures on many web sites for HDR.

I have set my camera to use the Custom Modes C1, C2 and C3 and rotate the dial to select each in turn. They are set as follows:

Mode C1 set -4 EV, -3EV, -2 EV
 Mode C2 set -1 EV, 0EV, +1 EV
 Mode C3 set +2 EV, +3EV, +4EV

I use these settings to enable the blending of various features later in Photoshop as required.

For AEB to work on my Canon EOS 7D I must shoot in continuous image mode, high or low speed.

5. Taking the Photograph

Tripod: Set the tripod up ensure that it is level

Camera: Set Camera up on tripod with spirit level ensure it is level and attach the remote control. Set Camera to Av Mode.

Alignment: Check the alignment and symmetry of the image

Aperture: Set the Aperture

Exposure: Check the exposure timings

Focus: Focus the camera and set to manual focus

Mirror Lock Up: Set Mirror Lock Up

Test shot: Take a test shoot and check for sharpness by zooming in on your display. Check for correct exposure using the histogram.

When you are satisfied with your test shot set your camera to the AEB Mode and take the required number of exposures.

Final check: Once you have completed the exposure sequence check all images on the cameras display screen for sharpness, exposure and detail.

More Exposures: If more exposures are required take them now before you move the camera and tripod. Details in stained glass, Blown highlights etc

Remember you might only visit this location once.....

More exposures are better than too few !!

6. Processing the Images

Timings

After taking your images sit back and relax. Wait a few days before processing.

I normally back my images off of the camera card to a hard drive.

Import them into Lightroom, Group and Stack the images into process groups then stop.

Work Flow

Adobe Camera RAW (ACR)

Open the images in ACR via the use of Adobe Bridge.

Chromatic Aberration (CA – colour fringes on high-contrast edges), and correct them . These colour fringes will be amplified in the HDR process.

White Balance Check the white balance on each image and set to the same colour temperature value.

Save the corrected images as 16 bit TIFF files from within ACR.

Early Noise Reduction 1.

Before processing your images into Photomatix load the saved tiff files into Photoshop and apply noise reduction as required using Topaz Denoise.

Save the files as TIFF Files.

I do this because Photomatix will amplify noise in the source images. I do not sharpen or do any noise reduction in ACR.

If it is difficult to achieve the correct compromise between reducing noise and retaining details, go for the details.

This will leave noise in some regions of the image but Photoshop's layer masks will allow the blending of different versions of the image in post processing.

You can also apply NR again in post-processing to optimize those noisy regions and then blend them with the rest of the image.

Photomatix

Load the image into Photomatix. If you have done CA-corrections, as above, do not choose the respective option in Photomatix.

Turn off Noise Correction as well, if already applied.

If required in Photomatix Pro 4, there is a semi-automatic deghosting option that can be used if required.

Create and save the HDR Image.

Now apply the tone mapping options that enhance your image. This may take 10 to 30 minutes. Refer to the previous workshop notes. Be conservative in your settings. The objective is to get 80 to 90 percent of the image looking good with details in shadows and highlights. Colours can be corrected in Photoshop.

Once you are happy with your results click on "Process" and save the result as 16-bit TIF.

Photoshop

Layers

Each adjustment within my work flow has its own layer or smart layer contained within a group.

Masking

A key skill in Photoshop is **Masking** when processing the HDR Image.

A mask hides or reveals detail in the layer being processed.

Black Hides and reveals the layer underneath

White Reveals the current layer.

The brush tool is used to apply black or white to the layer mask.

The brush tool is selected by pressing "**B**"

The default swatch colours of Black and White are set by pressing "**D**"

The background and foreground colour swatches are switched by pressing "**X**"

The **hardness** and **opacity** of the brush are adjusted to achieve the required effect.

By using masks selected areas of the image can be adjusted.

Open the tone mapped image in Photoshop

If you require too blend any of the exposures into the image do so now. Once you have masked in the areas you require flatten the image to one layer the background layer.

You now have a starting point for further enhancement.

Smart Objects

I use smart objects in my workflow. These are a feature within Photoshop. By using this feature I am able to go back and amend any third party filter settings I apply. This give a larger file size and documents are saved using the PSB file type not TIFF or PSD.

Groups

I now look at the image as whole and split the image up into areas I wish to enhance details and colours in.

These areas are represented by groups. Each group has a Layer Mask at the top level and associated adjustments.

I will set the empty groups up first.

Base Image Adjustments

I then will make all the necessary base adjustments to the image. These adjustments include:

- Any necessary transformations to correct the image (e.g. perspective correction and/or rotation to straighten the horizon)
- Levels adjustments
- Curves Adjustments

I use the adjustment layers option rather than the options found under the Menu Option "Image>Adjustments".

After making these base adjustments I merge the visible layers to a new layer.

I will then enhance the colour, contrast and details further using various plugins etc using smart objects/layers

Chromatic Aberration – Adjustment in Photoshop

(CA – colour fringes on high-contrast edges), and correct them .

These colour fringes will be amplified in the HDR process.

These can also be corrected in Photoshop using the following method:

1. Duplicate your Base Layer

Start by duplicating your "base" layer and by that I mean the layer you have made any adjustments or corrections to.

This will become the layer that does the initial Chromatic Aberration reduction.

2. Apply a Gaussian Blur

Once you have your "CA" layer, apply a Gaussian Blur (Filters Menu > Blur > Gaussian Blur) and give it a radius of between 2 and 8 pixels, depending on the resolution of your file

3. Set the Blending Mode to Color

This new "CA" layer that you have will be blurred, obviously.

Set the Blending Mode of this layer to Color. This is where you can potentially stop the correction process, as in some cases this single layer does a good enough job of canceling the Chromatic Aberrations out.

4. Add a Hue/Saturation Layer

The next step in the process is to add a Hue/Saturation layer to specifically target the remaining Chromatic Aberrations.

Select the "Cyans" channel in the drop down menu, and then by using the colour picker, pick a spot in your document where there are still cyan fringes visible.

This is telling the adjustment layer what specific colour to target.

Amend the saturation slider to suit.

Clip the Hue/Saturation layer to the CA layer blow it

Using the same Hue/Saturation adjustment layer, we will do the same for the magenta fringing.

Use the color picker on your Hue/Saturation layer to find the required channel by selecting a magenta fringe.

The drop down menu change to "Reds 1" or "Reds 2" depending on the temperature of the fringing you target.

Amend the saturation slider to suit.

Now note any issues you may need to address via masking the adjustments in this layer.

Topaz Adjust

Topaz Adjust is selected from the Filters menu. When you start Topaz Adjust there is a list of presets on the left hand side and adjustment sliders on the right hand side.

RESET all to their default value by pressing the Reset All Button. This setting has no effect on the image as displayed.

This sets all sliders to their default (neutral) setting. Then, I gradually work my way towards the desired settings by moving down the sliders.

I first adjust the exposure settings. I start by setting the Adaptive Exposure value in small increments it in steps only. Adjust to your taste. The Regions value will make the effect more global or more local . Contrast and Brightness I leave at zero as they do not have the same effect as the normal contrast and brightness adjustments found in Photoshop.

It may also help to protect Shadows and Highlights using the last two sliders.

I will then adjust the Details Settings. I will always check the Process details independent of exposure check box.

This will make the image a softer but increasing the Strength will resolve that. The best setting of the Strength slider depends on the size of the image. For larger images try values between 2.0 and 3.0 while normal images try settings between 1.2 and 1.8.

I will then adjust the colour settings and see what the effect is on the image. Care must taken with these sliders.

Topaz Denoise

The tone mapping process will tend to increase the noise in the image. This additional noise processing should be applied early in the post processing stages.

It is by applying it earlier in the post processing you will not amplify any noise with your other processing steps.

Make a copy of the layer treated with Topaz Adjust and apply Topaz Denoise to it.

I will apply noise reduction to each area of the image I have grouped via the use of layer masks based upon selections.

NOTE: You may not need this step. Look out for noise that sneaked back into your image and remove it selectively via the use of masks.

Using Groups

In using groups you can apply adjustments to one small part of your image via the use of layer masks and masking techniques. These are selective editing techniques which will involve the use of complicated masking selections and manipulations.

Sharpening the Image

When you have finalized your post-processing steps, your image will be represented over many groups and levels.

The most frequently used sharpening method, Unsharp Mask, is not suited to sharpen such an image because it modifies sections of a specific layer directly.

I use the High Pass Filter. This filter isolates only the edges of the image.

To apply this filter merge the visible layers in your image. This will include all the groups and base adjustments. Only the layers beneath this layer will be sharpened.

Set the blend mode of this layer to overlay

Select the High Pass Filter from “Filter>Other”

Settings between 2 and 4 should be OK.

The strength of any sharpening can be adjusted via the opacity setting for this layer

Apply a vignetting effect

Create vignetting Group and add a new fill layer to this group via the menu “Layer > New Fill Layer > Solid Color...”. When you get to select a color, make it a solid black. Remove the layer mask from the fill layer if there is one.

Choose the “Elliptical Marquee Tool” from the tools palette.

Move the mouse pointer to the upper left corner of the image and click, and drag to the lower right corner then release the mouse button.

This will create an oval selection over the entire image. The selection should touch the four edges of the image.

Turn this selection into a mask using the “Add layer mask” button.

Click on the new mask to select it, and invert the mask by pressing Ctrl-I.

Apply the Gaussian Blur filter (“Filter > Blur > Gaussian Blur...”) with a radius of 250 (maximum possible value) to the mask.

After this filter has been applied, apply it a second time by pressing Ctrl-F.

Adjust the opacity of the fill layer to a value between 20 and 50%.

This will reduce the effect and make it more subtle to the viewer.