



Adobe Lightroom 6/CC Overview

Introduction

Adobe Lightroom is an image editing and management program designed specifically for photographers.

- It is considered a subset of Adobe Photoshop and shares many of its photographic tools and filters, but Photoshop is a broad platform for all kinds of artists.
- Photoshop is much more powerful since many artists use it. For example, you can simulate brushes, pencils, pens, and different kinds of art paper. It will also provide real world art effects such as the flow and absorption of water colors on certain simulated paper. It also supports tablets and other advanced artistic techniques.
- Lightroom is specific to digital photography and condenses its tools and focuses the workflow of a photographer towards reviewing, editing, and organizing their images.
- Lightroom also supports GPS Mapping and pinning photos to a location. It can help layout a book of your images for publication. You can also use it for presentation in the digital slide show module, the print window for organizing prints, and the Web interface for Internet publications.

Installation

There are two ways to obtain Lightroom. Choose the version for PC or Mac.

Subscription	Perpetual License
\$10 per month	\$149
Free upgrades	\$79 upgrade for new releases
Includes Lightroom & Photoshop	Lightroom only
Includes LR Mobile Sync Space	LR Mobile Sync not available
Download only	Download/boxed (updates are downloads)
Some parts (Develop, Map, Mobile Sync) stop working when you stop paying	Continues working indefinitely
New features in dot releases	Bug fixes and new camera/lens support only

This means Lightroom is one of the few products still available without a subscription. When Adobe subscriptions first started, there were widespread complaints from photographers which certainly helped keep Lightroom perpetual.

Subscription versus Perpetual

With subscription you get everything Perpetual provides plus the latest Photoshop. You also get all the new bells and whistles that are added between major releases. In addition you get a permanent monthly bill from Adobe. If you let your subscriptions expire, Lightroom becomes crippled and you lose the ability to enhance your images. If you're a serious photographer and need the latest enhancements, subscription may be for you.

With perpetual you can use it forever, but must pay for future releases. You also get bug fixes and new hardware support. If you're on a budget and don't care about all the new bells and whistles the instant they come out, and you'd prefer to choose to pay less frequently, choosing when to upgrade, perpetual may be the better choice. At least you'll always be able to run a version of Lightroom that supports all your work.

There is a Trial Version available that works for a limited time. It lets you check out your hardware to make sure it works and gives you a feel for the software.

Advantages of Lightroom

- Lightroom provides an almost complete set of tools for manipulating and editing your images yet it leaves your original image files untouched.
- Lightroom will organize your images into a Catalog where it keeps track of image editing history, but also provides a powerful search engine to locate and analyze your library.
- Lightroom supports RAW image files directly without the need to convert them to another form.
- Lightroom supports only images you add under its control. Some image editing and organization packages will search and control all images on your computer. You can control what Lightroom supervises.
- Lightroom can also store your image editing History in a file by the same name as each image in the same directory (called an XMP file). This keeps the history intact even if you move the images to another computer or version of Lightroom, or if your Lightroom database were to become corrupted. This feature is highly recommended.

Disadvantages of Lightroom

- Lightroom can be very slow. Be sure to put it on your fastest computer.
- If you don't use XMP files to track your changes, or don't preserve them on your computer, and your Lightroom database is lost or corrupted, you will lose the history of all changes made to images. The images will still be intact, but your tweaking could be permanently lost.
- Lightroom doesn't do everything that Photoshop does so you still may need it to do more advanced changes to your images. For example, creating composite images, or applying custom masks can only be done in Photoshop.

Metadata and XMP Files

Since your original image files are unchanged, everything you do to an image when in Lightroom is recorded in both the Lightroom Database and (optionally) in an XMP file stored with each image. If you look at an XMP file, you'll discover XML instructions for modifying each image as if starting from the moment you load it into Lightroom. Do not edit this file. This is just to show what it looks like.

```
<x:xmpmeta xmlns:x="adobe:ns:meta/" x:xmptk="Adobe XMP Core 5.6-c011 79.156380, 2014/05/21-23:38:37" ">
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
<rdf:Description rdf:about=""
  xmlns:tiff="http://ns.adobe.com/tiff/1.0/"
  xmlns:exif="http://ns.adobe.com/exif/1.0/"
  xmlns:xmp="http://ns.adobe.com/xap/1.0/"
  xmlns:aux="http://ns.adobe.com/exif/1.0/aux/"
  xmlns:photoshop="http://ns.adobe.com/photoshop/1.0/"
  xmlns:xmpMM="http://ns.adobe.com/xap/1.0/mm/"
  xmlns:stEvt="http://ns.adobe.com/xap/1.0/sType/ResourceEvent#"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:crs="http://ns.adobe.com/camera-raw-settings/1.0/"
  tiff:Make="NIKON CORPORATION"
  tiff:Model="NIKON D700"
  tiff:Orientation="1"
  tiff:ImageWidth="4256"
  tiff:ImageLength="2832"
  exif:ExifVersion="0221"
  exif:ExposureTime="1/100"
  exif:ShutterSpeedValue="6643856/1000000"
[MANY MORE LINES OMITTED]
```

Figure – Sample of the Inside of an XMP File

Why XMP Metafiles are Important

It is HIGHLY RECOMMENDED to write your edit changes to Metadata XMP files. This is an extra precaution in case your database is corrupted. The database is backed up periodically, but if your computer crashes and you lose the backups, you are in big trouble. XMP files do not appear in Lightroom to clutter up your list of images, but it does use them behind the scenes to record your edits.

In the next section it recommends you store all images on a fast external drive that is cloned to multiple copies. If your computer crashes and is unrecoverable, your images and your Lightroom changes (in the XMP files) can be restored onto a new computer.

Forcing Metadata into XMP Files

To force XMP files to be created, choose EDIT>CATALOG SETTINGS then select the METADATA Tab, and check the box marked AUTOMATICALLY WRITE CHANGES INTO XMP

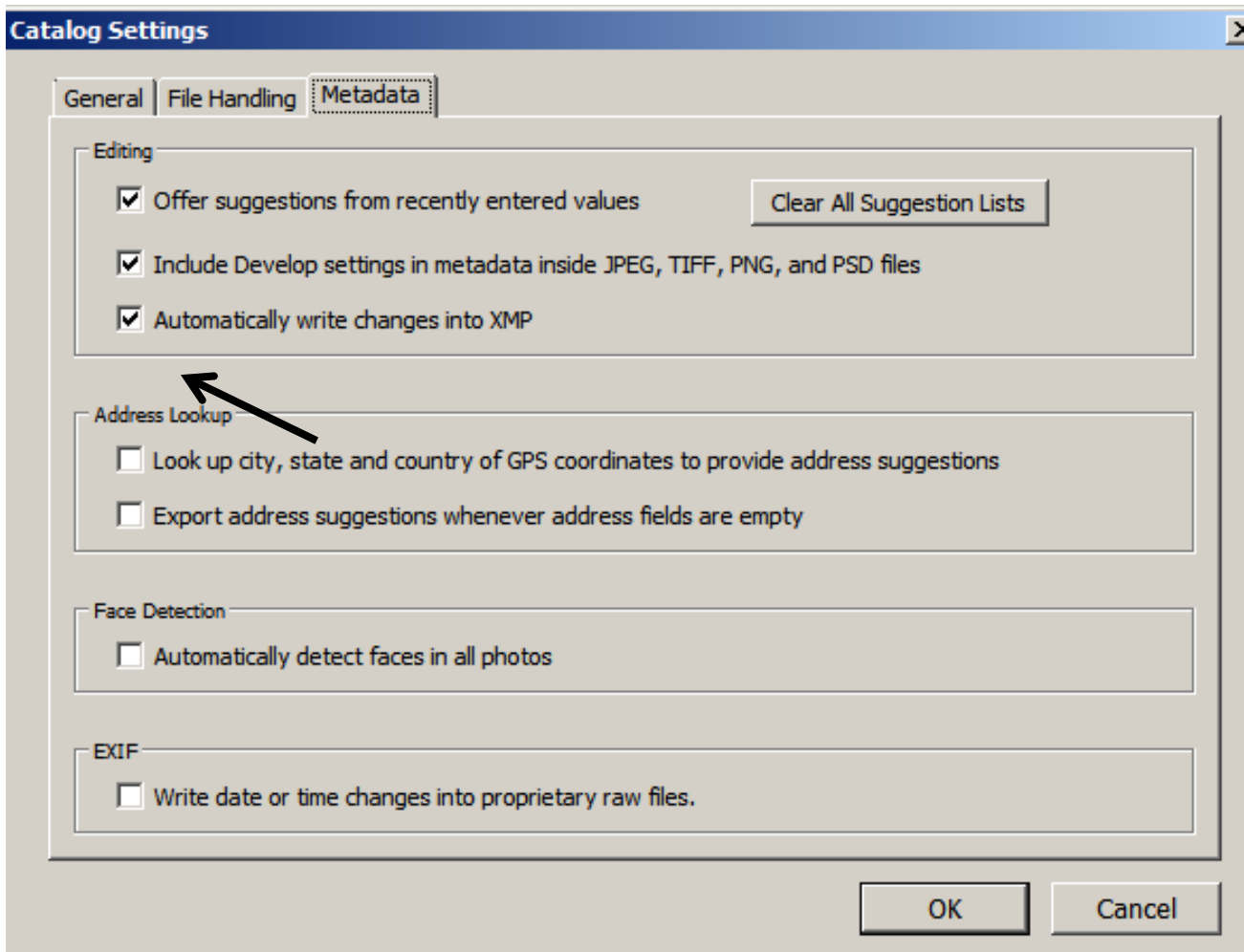


Figure – Forcing the creation of XMP Files

The Lightroom Interface

Here's what the default view of Lightroom looks like after its installed and images load.



Lightroom Interface Walk-through

- Standard Pull-down Menus appear at the top and a film strip of images at the bottom.
- The 7 interface modules are selected in the upper right. When one is selected, the main window and left and right controls change based on the module.
- The 7 modules are: LIBRARY, DEVELOP, MAP, BOOK, SLIDESHOW, PRINT, and WEB.
- The default on starting is the LIBRARY. On the left you will find a series of collapsible menu items:
 - NAVIGATOR – shows a thumbnail of your current image and its zoom factor
 - CATALOG – shows statistics and counts of your images
 - FOLDERS – shows a tree structure of your image folders
 - COLLECTIONS – shows filters and the results of smart collection queries
- When selecting the LIBRARY module, the controls on the right appear for checking the exposure of your images and also, to do mass corrections in WHITE BALANCE and TONE CONTROL. I generally just skip to the DEVELOP Module.
- When in the LIBRARY module, you can also mass apply keywords to images, or edit or view the EXIF and IPTC Metadata of images. That's nice if you'd like to mark an entire set of new images with the name of the location or a vacation title.

LIBRARY Interface Preparations

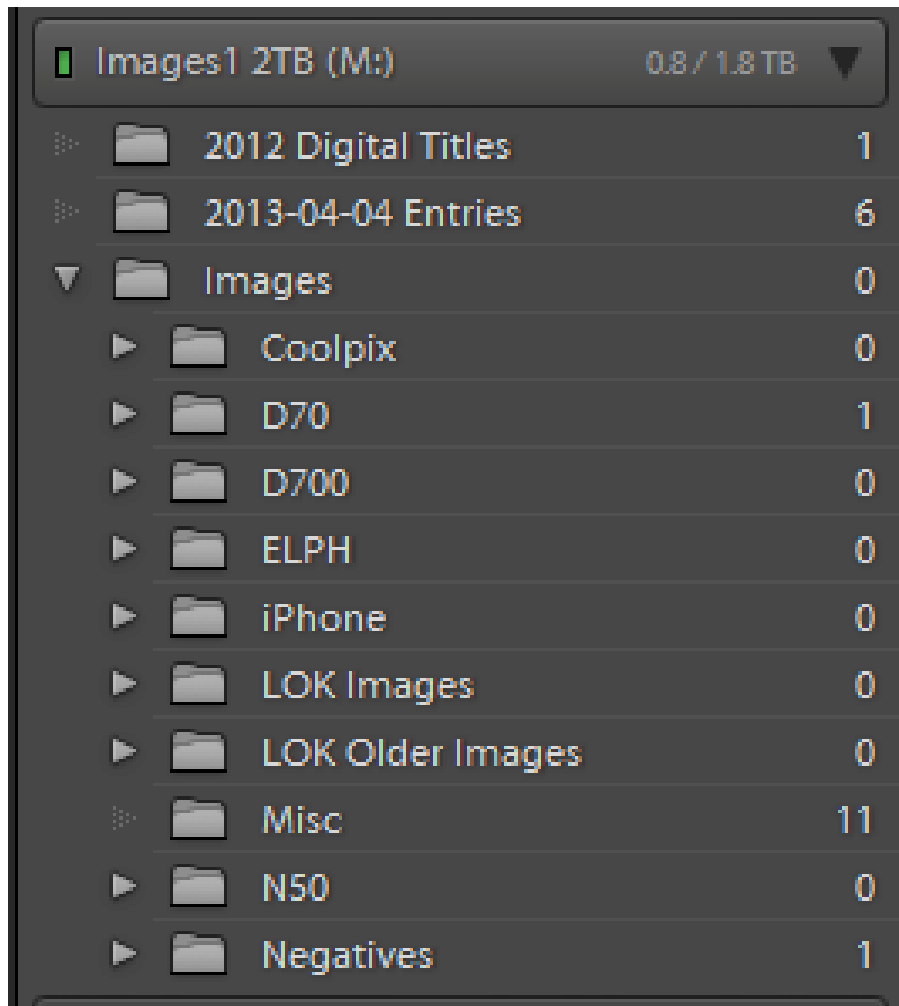
Before using Lightroom, I recommend:

- **3 Dedicated External Hard Drives for all Images** – I keep all my images on an external drive that's also fast and removable. I then clone* that drive to 2 other identical drives, and always keep one in a Safety Deposit Box.
- **Single IMAGES Folder** – I keep all images in a single folder called IMAGES (clever eh?). Then below images, I've created a subfolder labeled for each camera model. A single images folder lets you clone or do incremental backups more easily.
- **Import Directory** – My current camera Model is a D700, so that's my most active folder. Each my camera model folder, I have a folder called \$NEW where I import all new images. I use the \$ symbol so it's alphabetically at the top.
- **Standard Topic Subfolders** – Alongside \$NEW, I have subfolders which are common to all camera models; for example BIRDS or CRITTERS. Below them will be specie folders.

* I use three 4-TB Western Digital "Green" drives (for extended reliability). I access them using a StarTech ESATA dual drive bay which also clones one drive to another without a computer. It also supports USB if you don't have an ESATA port on your computer.

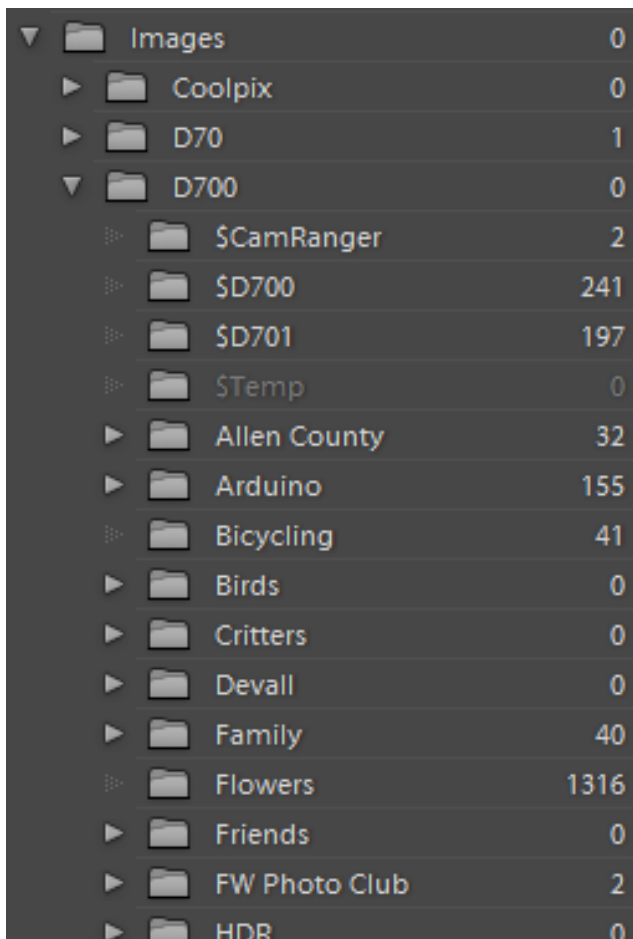
LIBRARY Folder Example

Here's what my Lightroom folder structure looks like. I have MANY other image folders, but these are the only ones I want Lightroom to manage.



LIBRARY Module Import

Because I work with two D700 cameras at the same time, I don't want to mix my initial image imports into a common \$NEW folder, so I created a \$D700 and a \$D701 folder, and keep them separate at first,. My camera prefixes D70x on all images. I then review in those folders. When I've deleted unwanted images, I drag the rest into category subfolders.



A screenshot of a file explorer interface showing a folder hierarchy. The 'Images' folder is expanded, revealing several subfolders. The 'D700' folder is also expanded, showing subfolders 'SCamRanger', 'SD700', 'SD701', and 'STemp'. Other folders include 'Allen County', 'Arduino', 'Bicycling', 'Birds', 'Critters', 'Dvall', 'Family', 'Flowers', 'Friends', 'FW Photo Club', and 'HDR'. The number of items in each folder is listed to the right of the folder name.

Folder Name	Item Count
Images	0
Coolpix	0
D70	1
D700	0
SCamRanger	2
SD700	241
SD701	197
STemp	0
Allen County	32
Arduino	155
Bicycling	41
Birds	0
Critters	0
Dvall	0
Family	40
Flowers	1316
Friends	0
FW Photo Club	2
HDR	0

Rename Files before Importing

I unload my camera by moving images from my camera folder to one of the \$D700 or \$D701 folders. I then run a Windows program I wrote to mass rename my image files. I find the DSCNxxx camera names to be worthless later so I like to add permanent value to my image file names. Also, with two D700 cameras it helps to keep them straight, so I rename all images based on a naming standard. It gets date/time from the image file so this must be done before making any modifications. Here's the naming standard:

XXXX – YYYY-MM-DD – HHMMSS – NNNNNN.NEF

XXXX	Camera Model, for me D700 or D701
YYYY	The year the image was taken
MM	Month the image was taken
DD	Day the image was taken
HHMMSS	Time the image was taken
NNNNNN	Camera given image number from the file name (e.g. end of DSCN 0675)

Examples:

D700 - 2015-12-14 - 141114 – 3882.NEF

D700 - 2015-12-16 - 152326 – 3897.NEF

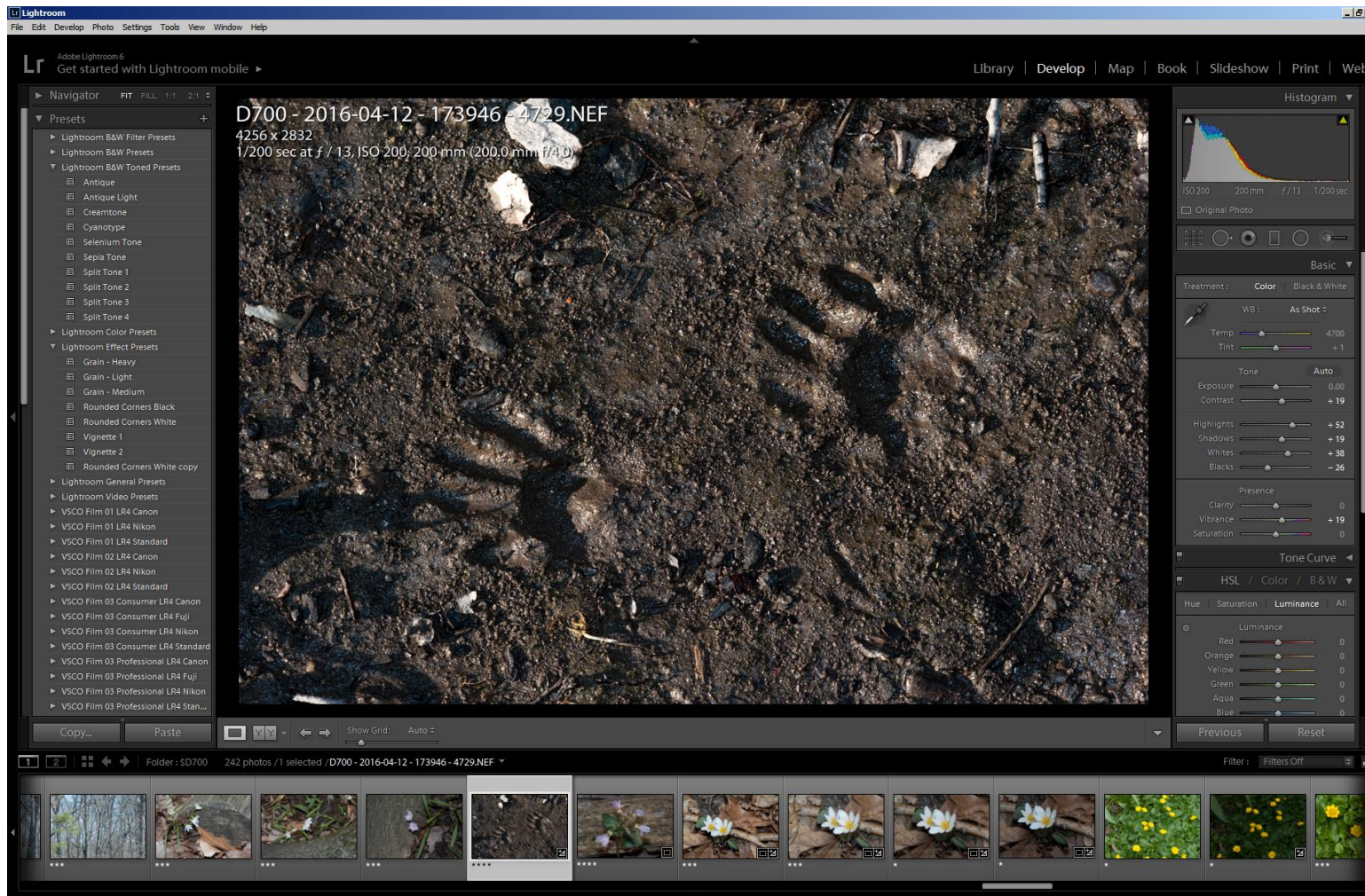
D700 - 2015-12-16 - 152414 – 3908.NEF

Import Images in the \$D70x Folder via SYNCHRONIZE

1. Locate the folder in Lightroom containing my new images.
2. I right click on that location and choose SYNCHRONIZE from the pop-up menu.
3. If new images are located, they will be imported but will appear under the CATALOG location above your FOLDERS in a tab called PREVIOUS IMPORT.
4. At this point, you can mass process or review images, and discard any you don't want.
5. To assist in preprocessing your images, you can use a list of tools at the bottom of main center screen.
 - A Grid of images in the main screen (you can click an image or use the film strip)
 - A single image is shown in the main screen as you click the film strip
 - X / Y view. If you pick 2 images, it will place them side-by-side for comparison
 - Rate images 1 through 5 stars by clicking 1 through 5 on your keyboard.
 - Right click an image and flag it (for keeping) or assign it a color value flag
6. Once you have made a pass on the new images, you can delete what you won't need. I like to rate the images 1 or 3 at this point and delete all the 1 rated images. I save higher rating for after I edit and process. 2 is reserved for images I don't review, such as JPGs I send by email, or Photoclub related screens or workshop material.

Moving to the Develop Module

As indicated previously, if you click to a different module, the top pull-down menus, and bottom film strip remain the same but the menus and options on the left and right change.



Develop Module Workflow

- Once in the Develop Module, the left will change to 5 expandable menu items called NAVIGATOR, PRESETS, SNAPSHOTS, HISTORY, and COLLECTIONS. When developing your images for presentation and improvement, select PRESETS.
- On the right in the Develop Module, you are presented with HISTOGRAM, a TOOL BAR, BASIC Develop Settings, TONE CURVE, HSL/COLOR/B&W, SPLIT TONING, DETAIL, LENS CORRECTION, EFFECTS, and CAMERA CALLIBRATION.

Workflow Technique Tip

To “Develop” your images into masterpieces, work your way down each tool, observing its effect on your final image. As you work your way down through the Develop tools, use your mouse to make adjustments and keep your finger on the “undo” keys: CTRL-Z (PC) or CMD-Z (Mac). Don’t be afraid to try something to see what it does to your image. As soon as you make an adjustment, you can simply hit the “undo” key to change it back.

Also, on any slider control, if you double click on the slider knob itself, it will return to its default position before you moved it.

Develop Module HISTOGRAM

1. Start with HISTOGRAM. With a normal daylight image, your Histogram is generally like a bell curve. It can be more complex, but:
 - What you are looking for are parts of the curve that are off center, or stacked up on the left or the right. This can indicate under or over exposure.
 - At the top left/right of the Histogram you will find up arrow characters.
 - Clicking on the left one reveals in your image areas that are underexposed.
 - Clicking on the right one reveals in your image, areas that are overexposed.
 - If only a single color is poorly exposed, the arrow will be that color.
 - You can click any troubling area of the histogram (left, right, or center) and hold the mouse and drag that area to attempt a mass correction.
 - If you see a lightning bolt near the bottom of the Histogram means there is a new version of Lightroom that you can upgrade that image too. Otherwise it preserves the Lightroom develop settings and tools for when the image was first imported/synchronized.

If you do nothing else in HISTOGRAM at least start to get a feel for what parts of your images may have issues in lighting and exposure.

The Adjustments Toolbar

The Adjustments Toolbar is positioned between the Histogram and the Basic Develop Module for a reason. You should stop there and make adjustments before proceeding with the rest of the tools.



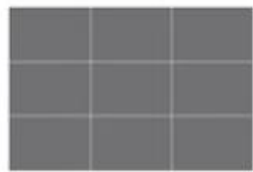
The tools which will be present in order are as follows:

- The Crop Overlay Tool
- The Spot Removal Tool
- The Red Eye Correction Tool
- The Graduated Filter Tool
- The Radial Filter Tool
- The Adjustment Brush

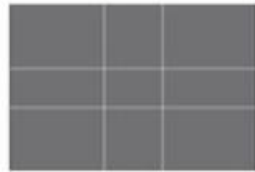
The Crop Overlay Tool

Before proceeding with other adjustments, crop your image if needed. The Crop Overlay Tool allows for excellent control over cropping.

- It allows freeform cropping,
- Can lock the aspect ratio to preserve its dimensions,
- Will quickly turn an image to align a horizon,
- Allows unlocking of the aspect ratio to refine your crop to specific images
- Provides gridlines for various industry recognized cropping perspectives, such as the rule of thirds (once CROP is selected toggle Crop modes with the “O” key):



Rule of Thirds



Golden Ratio



Triangles 2



Golden mean



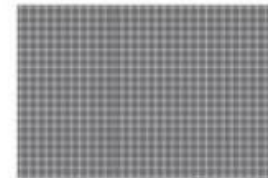
Diagonal Lines



Triangles



Golden mean 2



Grid Pattern

Spot Removal Tool

This really speeds up removing dirt or sensor spots from images. Select the tool, and a sample will appear in the upper right of the image. Adjust the size to slightly greater than the average diameter of the spots you need to remove, then simply click on every spot, or choose a band of spots and brush them all with the tool.

When the Spot Removal Tool is selected, on the bottom left border of the image, a check box will appear that allows you to “Visualize Spots”. Once selected, the image goes away into a dark background and spots similar to the ones you’ve been removing are much more obvious. Continue to remove from that view, then uncheck “Visualize Spots” to remove that mask.

Red Eye Adjustment Tool

Choose this tool, start in the center of an eye, then stretch it to circumscribe the subject's whole eyeball. Once you let go, it removes red eye for the selected area.

Graduated Filter Tool

Select the tool, and then drag starting from an edge of the image parallel to where a swath of the image is darker than the rest, drag until you reach the opposite edge of the image, adjusting the angle to best select the area to enhance. Let go of the mouse, then select EFFECT, choose an EFFECT value, then increase or decrease its AMOUNT until satisfactory. Typically you choose exposure to adjust but Lightroom provides MANY values to adjust.

Adjustment Brush Tool

This tool allows you to literally brush more exposure, color or any number of attributes directly onto your image with a variable size brush. If you have a small underexposed area, this can be adjusted. You have control over brush SIZE, FEATHERING (how much it blends with the surroundings), FLOW (how much adjustment brush “paint” flows on the area to be healed), and Density (100 creates an opaque effect, but less allows “transparency”).

You can also check or uncheck AUTOMASK. AUTOMASK enhances your brush by using color and contrast to detect the edges within your image. As you paint, it searches for similar tones to what the center of your cursor is on, and only applies adjustments to areas that are similar.

Develop Module - BASIC

Expand the BASIC tab on the right of the Develop Module and again, work your way down each control.

- **White Balance** – Use this only if you know of a problem. It should default to “as shot” indicating its using what the camera settings where. You can change that to AUTO to let Lightroom try to improve your White Balance (CTRL/CMD Z to Undo). With JPG you can also manually adjust the light temperature or Tint. With Raw files such as NEF, you have a much larger list of adjustments available (such as DAYLIGHT, TUNGSTEN, FLASH, etc.). In fact, you are able to fully control errors in White Balance with RAW files in Lightroom outside the camera. This is not true for JPG and some other formats.
- **Tone Controls** – This is where you get the most out of Lightroom when your images need tweaking. Again, strike the UNDO keys to back out the last change, or keep hitting it to continue undoing changes.
 - **AUTO** – It’s often a good idea to try the AUTO button initially. This is Lightroom’s best guess at a tweak of the current image. It gives you an idea of what it might look like and make defects more obvious. Undo if you don’t like it or start from there.
 - **EXPOSURE** – This is used to adjust over or under exposure. It works closely with the **HIGHLIGHTS** slider. Adjust those two first.

- **CONTRAST** – Avoid using this too heavily unless you have a major defect or result you are trying to get. It can destroy subtle detail when used wrong.
- **HIGHLIGHT** – Works hand in hand with EXPOSURE to tune the lighter or overexposed areas of an image. Use to bring a glow to all highlights or reduce overblown bright areas. Also by decreasing EXPOSURE and increasing HIGHLIGHT you can get certain areas to “Pop”.
- **SHADOWS** – Reduces or Increases only shadows. Powerful in high contrast images.
- **WHITES** – Brightens or darkens only the white areas of an image. It can be used to bring out a glow in some images or reduce glare.
- **BLACKS** – Does the same thing as WHITES, but for all the black areas of the image.
- **Presence Controls** – This is a set of intelligent controls that affect groups of common components while leaving others alone.
 - **CLARITY** – I like to refer to this as a clean “sharpen”. It directly changes the contrast in only the mid-tones giving the image an overall sharpness without pixelization. Most images can use +10 Clarity.
 - **VIBRANCE** – This raises the saturation of only the lower saturated areas of the image, without affecting the already saturated areas. Most images can use a +5 to +10 Vibrance increase. Don’t use too much.
 - **SATURATION** – This raises or lowers the saturation of all colors in the image. Avoid Saturation unless you are correcting an obvious problem.
- **Tone Curve** – Lets you smoothly tweak tones in a continuous manner. Don’t use this unless you know what you are doing. This exceeds the scope of this workshop.

Develop Module - HSL/COLOR/B&W

Let's you adjust Individual colors in Luminance, Saturation, and Hue.

- **HSL/COLOR** – The same thing but HSL lets you focus on changing just one (Luminance, Saturation, or Hue) across all colors, or COLOR lets you adjust each for every color from a single control.
- **B&W** – Converts your image to Black and White, but then lets you adjust the Black and White color mixes as they affect the B&W Shading. This is powerful and is akin to using color filters. It lets you make “Ansel Adams Like” adjustments. Just try it and UNDO if you don't like the results.

Develop Module - SPLIT TONING

When you can't correct a hue or false color by adjustments in White Balance, try SPLIT TONING. For example, if you took an image under TUNGSTEN light and it came out orange, but White Balance starts to affect the overall image, go to split toning and try to adjust a single hue at a time.

- **HIGHLIGHTS** – This is used to correct unwanted color balance in the highlight areas of your images. Pick a Hue from the slider, and then adjust its balance.
- **SHADOWS** – This is used to correct lost or overly saturated areas in shadows. Pick a Hue from the slider, and then adjust its saturation.

Develop Module - DETAIL

The Detail section allows you to adjust sharpness and also reduce noise.

SHARPENING - This allows the sharpening of an image using essentially the same controls as found in the UNSHARP MASK within Adobe Photoshop.

- **AMOUNT** – slide the control to increase the effects of the sliders below.
- **RADIUS** – this adjusts the radius of sharpening around edges. 1 increases sharpness by 1 pixel and higher values sharpens more and more of the edge. Keep it under 1.5
- **DETAIL** - adjusts from 0 (the largest edges in the image) upward to the smallest edges. Keep it under 50. Detail can increase background noise.
- **MASKING** – handy control to mask out (avoid sharpening) of areas that shouldn't be sharpened. For example, a blue sky does not need to be sharpened or it will get fuzzy and end up with noise. Masking smooths out those areas.

TWO TYPES OF NOISE REDUCTION, COLOR and LUMINANCE - This allows the smoothing of an image that either has noise or it reduces noise introduced by the Sharpening tool. First, determine if you have luminance or Color noise. If you're not sure, change one or the other to see which has an effect.

- COLOR NOISE will appear as noise within common colors
- LUMINANCE NOISE is noise between different colors

See Examples on Next Page

NOISE REDUCTION - LUMINANCE – this is noise between color tone boundaries. Choose the LUMINANCE slider to change the amount of adjustment. Too much and your image melts together.

- **DETAIL** – next choose DETAIL to increase the LUMINANCE noise threshold. Higher values retain detail, but increase noise.
- **CONTRAST** – based on LUMINANCE AND DETAIL, lowering contrast will reduce the noise they introduce. The slider controls the difference between different color groups.



Figure – Example of Luminance Noise

NOISE REDUCTION - COLOR – this is noise associated within a color group.

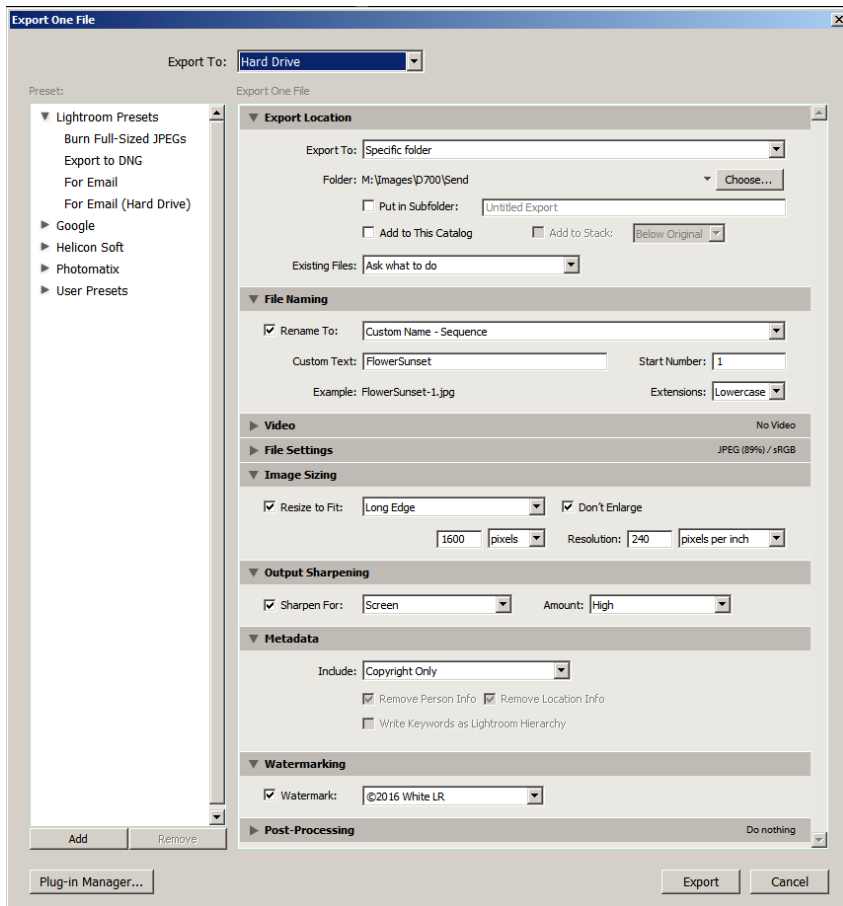
- **DETAIL** – next choose **DETAIL** to increase the **COLOR** noise threshold. Higher values retain detail, but increase noise.
- **SMOOTHNESS** – increasing smoothness of smooths out areas of common colors.



Figure – Example of Color Noise

EXPORT

Once I've got an image the way I want, I export it to a JPG file in a folder I call SEND. That started from me sending images by email, but I use it for Facebook, or for submitting images in Competitions. Right click the image and choose EXPORT.



LENS CORRECTION

Lightroom contains a number of profiles for most lenses. Aberrations in lenses are well known and can be modeled in the profiles. Simply expand LENS CORRECTION and click ENABLE PROFILE CORRECTIONS while watching your image. Lightroom should already know what lens you are using when working in RAW formats. If you like the results, keep the CORRECTION active.

EFFECTS

I generally use the built in Presets to vignette images but you can perform fine control over vignetting via the POST CROP VIGNETTING tool.

- **AMOUNT** – Slide left to increase black vignettes and right to increase white vignettes.
- **MIDPOINT** – Limits the vignette's entry towards the center and starts to backup at this point thus increasing the amount lost in the vignette area.
- **ROUNDNESS** – Adjusts the roundness of the vignette from oval to almost squared off borders of vignetting.
- **FEATHER** – This introduces an increased or decreases line of demarcation between the image and the vignette.

CAMERA CALIBRATION

This allows you to revert or promote camera specific Lightroom profiles based on releases of Lightroom and camera RAW levels. I always use the latest.

MAP, BOOK, SLIDESHOW, and WEB

These modules will not be covered in this workshop. MAP is for locating images on maps with GPS coordinates, BOOK helps laying out a book with images or layout planning purposes, SLIDESHOW assists in running a full screen slideshow of images on a screen or projector, with music, and WEB allows you to build a web interface of your images.

Print

I've found this useful for creating sets of images onto roll paper I use to print. It figures out how many images I can get based on my width and lets me create multiples of batches of images to print in masse.

