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PAGES



9
HOURS

The DAM Book Guide to Digitizing Your Photos with Your Camera and Lightroom

A Multimedia eBook
By Peter Krogh



The DAM Book Guide to Digitizing Your Photos with Your Camera and Lightroom

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The photographs in this book come from many different sources, including family members, friends and unknown photographers.

Photograph of Peter Krogh by Alyson Krogh.

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Design concept by Elinore Wrigley de Lisle, Me Jayne Design.

Video/audio production by Peter Krogh and Josie Krogh.

Proofreading by Alyson Krogh and Sherry Rawls-Bryce.

Published by DAM Useful Publishing

3301 Oberon St., Kensington, MD 20895

USA

DAM Useful Publishing provides information tools for photographers and other creative professionals. For more information or to request a review copy, contact us at info@DAMuseful.com or 301-529-5506.

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ISBN-10:0-9906667-1-9

ISBN-13:978-0-9906667-1-4

About the Author

Peter Krogh is an internationally recognized expert on workflow and Digital Asset Management for photography and other media. A commercial and editorial photographer for 35 years, he wrote *The DAM Book* (O'Reilly 2005 and 2009), and became a sought-after speaker, workshop leader and consultant worldwide.

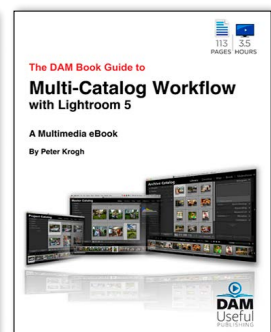
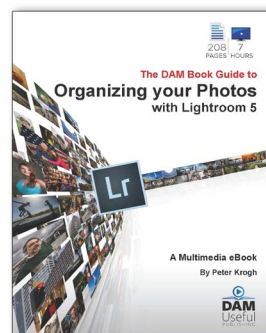
When not photographing, Peter spends much of his time researching and writing about the business, technical and creative challenges presented by digital photography. He lives in the Washington, D.C. area with his wife and two daughters.



In 2012, Peter Krogh was given the NDIIPP Individual Innovation Award by the U.S. Library of Congress.

About The DAM Book Workflow Guides

When the first two editions of *The DAM Book* were published, they included a thorough discussion of the principles of storage, organization and workflow, followed by demonstrations of that workflow in action. With the third edition of *The DAM Book*, the workflow is removed. The DAM Book Workflow Guides will continue providing workflows that are both software and task specific. This book is the third in that series.



Our DAM Book Workflow Guides are multimedia books with a unique blend of text, images and video instruction. They are designed from the ground-up as multimedia volumes, using text where it is most appropriate, and changing over to video to show workflow. This hybrid approach to instruction has been a big hit with readers, earning a 95% 5 star rating on Amazon.

About DAM Useful Publishing

DAM Useful Publishing is committed to providing clear and comprehensive tools to help photographers, and those working with photographs, to understand the digital photography ecosystem, and to maximize the longevity, discoverability, utility and value of photographic images.



About the photos in this book

The photos in this book have come from the Krogh Family Archive, which dates back more than 160 years. They have come from many different sources, in nearly all formats. Copyright, if applicable, for individual images remains with the original photographer.

Acknowledgements

This book continues the work that I have done in digital photographic education for nearly two decades and grows out of my passion for the preservation of photographic images. There have been a number of important people and organizations along the way. I need to thank my parents for the marvelous photographic archive that they passed on to us. That archive has given this book its soul.

Our DAM Useful team has been extraordinarily dedicated. My wife, Alyson, has been invaluable as a partner in the business, running marketing and operations. And my daughter Josie stepped up to fill many essential roles in production and tactics.

Dominique le Roux has been a remarkably versatile collaborator for a decade, in projects spanning the globe. Her role as editor and production manager are integral to the success of these books.

This book covers a broad range of subjects. I have been fortunate to work with some smart people. Thanks to: Tom Hogarty, Richard Anderson, Victoria Bampton, Katrin Eismann, Jeff Dunas, Jeff Sedlik, Gene Mopsik, Jack Reznicki, Tom Kennedy, John Beardsworth, Robert Edwards, Henry Wilhelm, Don Williams, Anna Dickson, Mikkel Aaland, Eric Chan, Bill Perry, Maura Mulvahill, Sam Kittner, Steve Uzzell, the Studio One crew, Greg Dinkins, Thaddeus Watkins, Todd Shaner, Mark Segal, Robin Myers, Doug Peterson, Peter Siegel, Brenda Hipsher, Ramesh Jain, Kaydin Carlsen, and the PhotoShelter team.

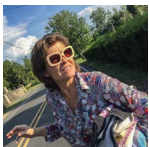
Props to the Library of Congress's NDIIPP and NDSA programs, along with NARA, IMLS and the NDI for being leaders in digitizing our past so it's with us into the future. Thanks for information, inspiration or collaboration to Carl Fleishauer, Phil Michel, Dana Hemmenway, Trevor Owens, Willian (Butch) Lazorchak, Kate Zwaard, Tom Rieger, Jame Mandelbaum, Sara Shpargel, Abigail Grotke, Erin Engle and Michelle Gallinger.

Thanks to my extended family, the Steuart and Garrett families, bears and geeks, and everyone pictured for being part of this.

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Dominique le Roux is a publisher and editor passionate about helping creatives tell their stories. Her work and travel itch have taken her all over the world, with home right now an apartment on the banks of the Mekong River in Asia.
www.moonshine.media



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This book is dedicated to my parents and grandparents – Paul and Dot Krogh, Harold and Helen Krogh, and Gordon and Charlie Donald – for the rich family and photographic legacy they have given us.



4" x 5"

Copy of a daguerreotype

Mrs. William Alexander Juhan
née Elizabeth Brooks

(6/30/1837 - 6/11/1901)

and her son

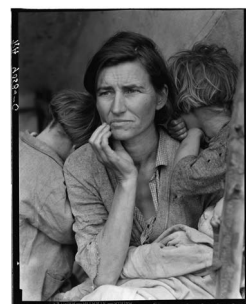
William Jefferson Juhan
(9/29/1859 - 7/18/1924)

ALMAN & CO.
690 FIFTH AVE., N.Y.

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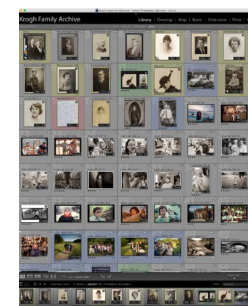
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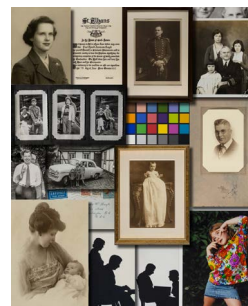
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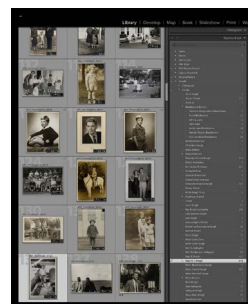
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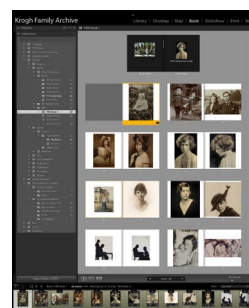
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INTRODUCTION

All the books I write are based upon real-world problems I encounter personally. This book is no different, and is inspired by my own family history project. As we downsized my father from his house of 56 years, I came into possession of the family photo archive. The photos date back more than 160 years, and include prints, albums, negatives, slides, glass plates, documents, and framed prints. They provide an amazing visual history of our family. With tens of thousands of slides, negatives, prints and albums jamming my studio, and with a willing and able daughter looking for project work, I had no choice but to get scanning.

I have been a pioneer in the camera scanning process for two decades – ever since I first got my hands on a digital camera. In that time, the process has grown from a useful hack into a preferred method for scanning. Superb cameras, elegant software, and web-sharing services make the process fast and efficient. And while these techniques are very common in some of the top museums and libraries, they are not widely known among the general population. And so, it was also time to write a new book and use my project as the example.

WHO IS THIS BOOK WRITTEN FOR?

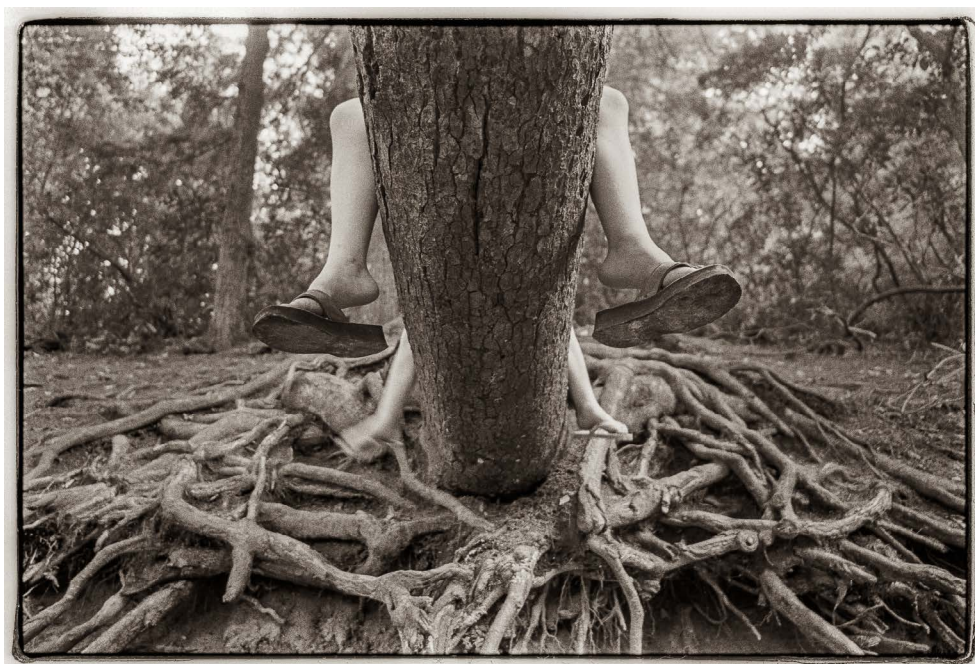
The need to digitize photo collections is shared by families, companies, and other institutions. Visual media play an ever-increasing role in our understanding of history, and in our daily communication. And the visual history stored in your photo collection provides context and connectivity that transcends the written word. Digitizing the collection is essential to both preserving this history, and sharing it with others.

If you are responsible for a collection of photos, then this book is for you.

The techniques outlined in this book are within the technical capabilities of millions of photographers, both professional and hobbyist. By following the recipes contained here, a careful person who owns a digital camera can make great digital scans. Professional photography skills are a plus, but not necessary by any means.

DIY

There is a clear ethos of Do It Yourself in camera scanning. I know hundreds of pro photographers who have improvised setups and made good scans (and some who make great scans). Until this book, there was no comprehensive guide to the process. With this guide in hand, it's now possible to *do* it yourself, without having to *design* it yourself. I'm confident that even experienced photographers who have been shooting their own scans will learn some valuable new techniques.



DIWO

Beyond helping the do-it-yourselfers, this book helps to smooth the way for DIWO – do-it-with-others. By creating a standardized workflow, built on commonly available tools, we can help to grow an ecosystem around the process. While some readers may want to do the whole process by themselves, I expect that it will be much more common for teams or contractors or services to handle specific tasks.

Some readers may want to hire someone to come in and scan. And some readers may be interested in offering scanning as a service. Your use of the techniques in this book does not require you to do every part of the process yourself. One of my goals in writing this comprehensive “cookbook” is to allow each reader to identify what he or she is interested in doing.

- A professional photographer may want to do the entire process for her archive of film and prints.
- A corporate collection manager can understand the process, and then hire contractors or staff to perform different tasks.
- A photographer with good technical chops may decide to offer an on-site scanning service.
- Another person or company may decide to offer post-processing services.
- An equipment manufacturer may see an opportunity to build new hardware to help streamline the process.

The owners of a collection can read the book to understand when to find people to help. And people, companies and other institutions can provide some portion of the services needed. We’re already seeing digitizing stations pop up in local libraries, and some of these will undoubtedly rely on cameras for the scanning.



MORE ONLINE

Directory of scanning services

Some readers will want to do every step by themselves or by in-house staff. Some readers may want to outsource the scanning and just do the annotation. And some readers may want to get some assistance getting things set up. We will be compiling a list of individuals and companies offering services related to scanning and image optimization. If you are looking for help – or if you want to offer your own services, check out the page:

www.theDAMbook.com/dyp/services

OTHER SCANNING METHODS

This book is devoted to the use of a digital camera as a scanner. Of course, there are other methods, which can produce excellent results. There are some film scanners that will produce higher resolution, and some industrial scanners that offer fast automatic scanning on a large scale. And there are also services that will accept your shoebox full of photos and return them in digital form. All of these have their uses, and some readers will decide to use a combination of approaches.

The only scanning method I discuss in this book is the use of a digital camera. I do this because of the advantages it offers, and also to limit the scope of the book. We do include a link to some of these other methods on the website for those who wish to investigate.

If you do decide to use other scanning methods for some or all of your collection, it's still possible to use the tagging, organizing, curating and sharing techniques that this book outlines.

WHAT ABOUT DIGITAL ORIGINALS?

Many, if not most, readers will also have born-digital photos to manage along with the digital copy photos. Like the use of other scanners, that's not a topic we cover here. That's partially to limit the scope of the book. But it's also because the topics are well-covered in a companion book, [Organizing Your Photos](#). Readers of OYP will recognize much of the workflow described in this book. The details of how you merge these two collections, if you have both, will be highly dependent on the details of your collections. Using these two books in tandem should provide key insights on how to accomplish that.

EXTERNAL RESOURCES

This book provides a framework and structure for the camera scanning process, emphasizing the parts that are unlikely to change quickly. There are some parts of the process that are always in flux – the specifics of hardware, software, and support services. Where specific recommendations are likely to change quickly, we handle the specifics through the use of linked pages. Items like camera models, LED lights or web services are simply changing too fast to lock down in book form.



MORE ONLINE

Wherever you see this link icon, you'll know that you can find more information on one of our web resource pages. Click here to see a list of web resources pages:

www.theDAMbook.com/dyp/resources

DEFINITIONS

- **Original Photo** This is the photo being scanned or copied. In this book, the term does not imply that the photo is the actual one and only original of the photo (such as the slide that came out of the camera). Instead, Original Photo refers to any physical photo you are digitally copying. Note that I am also using the shorthand Original and Photo to mean the same thing – an actual physical photo.
- **Copy or Scan** This is the digital copy of a photo you make.
- **Camera Scan** A digital copy of a photo made with a digital camera rather than a conventional scanner.
- **Image** I use the term Image to refer to the actual photographic image. This image may be represented by a slide, negative, print, or the digital scan.
- **File** This refers to the digital representation of the image.

SUSTAINABILITY

Ever since I started as a photographer, the long-term preservation of photos has been a priority for me. *The DAM Book* was written specifically to address the issues of photo preservation and access. I have a deep commitment to my readers to help them preserve their images, even as the technology of digital photography changes.

I've had the good fortune to be involved in the development of some important standards and technology in the world of imaging. I know that my books have helped to inform the decision makers in standards bodies, government and technology companies.

If you have been following my recommendations, I promise not to leave you hanging. I'm happy to report that 12 years into this publishing effort, the structure and practices I outlined have proven to be solid and reliable, and have enabled my readers to move gracefully into the future of imaging technology.

I take this commitment seriously, and it informs all the work I do, whether it's a book, a blog post, or a casual conversation.



The Paine Studio
923 EST - WASH. D.C.



CHAPTER 6

EVALUATING & MAINTAINING QUALITY

Camera scanning provides advantages in speed, quality and cost over most other techniques. Speed and cost are easy to achieve, but producing high-quality scans requires more attention and expertise. In this chapter, I'll show you some of the techniques for producing the best scans possible.

HOW GOOD IS GOOD ENOUGH?

Scans can cost pennies each and they can cost hundreds of dollars each. While camera scans are in the inexpensive part of the price range, the quality can rival the most expensive scans you can buy. As I outlined in Chapter 2, you'll want to use the best camera and lens that you can afford. In general, a camera with 20 MP or more should provide enough quality for almost anything you need to do with the photos. Cameras above 30 MP are even better.

SCREEN VS. PRINTS

As you evaluate quality, be mindful of the difference between viewing on screen and in print. Viewing images on-screen allows you to zoom in very closely, showing every imperfection in the original and the digital copy. This can be very different from viewing a print where these small flaws may be invisible.

MAKE A TEST PRINT

As you consider whether a particular camera and lens are good enough for your project, you may want to make some prints of the copy shots and compare them to the originals. At the 20+ MP range, you should find that prints are very good up to 24 inches and even beyond.

You can run a test by shooting a copy of a photo and then making a print from the copy file. If you are unsure about the quality you are getting, you can always send the photo out for commercial scanning or printing to have something to compare it to.



DIGGING DEEPER

FADGI Guidelines

The Federal Agency Digital Guidelines Initiative has produced a document to specify process and quality evaluation for digitizing images and other documents. The guidelines were primarily targeted to museums and other cultural heritage institutions, and have some highly technical requirements. In many ways, this book is simply a user-friendly version of those guidelines, providing step-by-step instructions.

There are some important differences between what FADGI recommends and what I suggest here. FADGI requires all master images to be saved as TIFF, which I believe to be an outdated recommendation. It also makes workflow significantly slower and dramatically increases storage requirements. FADGI also recommends that users create a database of items to be scanned prior to the scanning instead of simply using the database of scanned images. Despite these differences, most of what's in this book aligns quite well with FADGI three- and four-star levels. If you are scanning for cultural heritage institutions, make sure to read through FADGI recommendations as you plan your project.

Download the FADGI Guidelines:

www.theDAMbook.com/dyp/guidelines

PROFILE YOUR MONITOR

Every computer monitor has a different color signature. Modern laptops and all-in-one computers are pretty good out of the box, but they usually add some extra punch that is not really in the actual file. If you want to see the most accurate reproduction that your monitor is capable of, you need to make a custom profile that compensates for the specific color cast of your monitor and the monitor driver settings.

A monitor profile is created by measuring the color output of your monitor across a range of colors and brightness. A piece of software then creates a profile and uses it to adjust the color of the display. Datacolor and X-Rite both make devices and software to profile your monitor.



Figure 6-1 To profile your monitor, use a colorimeter to measure the color and let the software do the rest.

High-end graphics monitors may also allow for actual calibration, where an internal program changes the settings of the monitor to be as close as possible to a reference standard. Most of these monitors come with their own dedicated measuring devices.



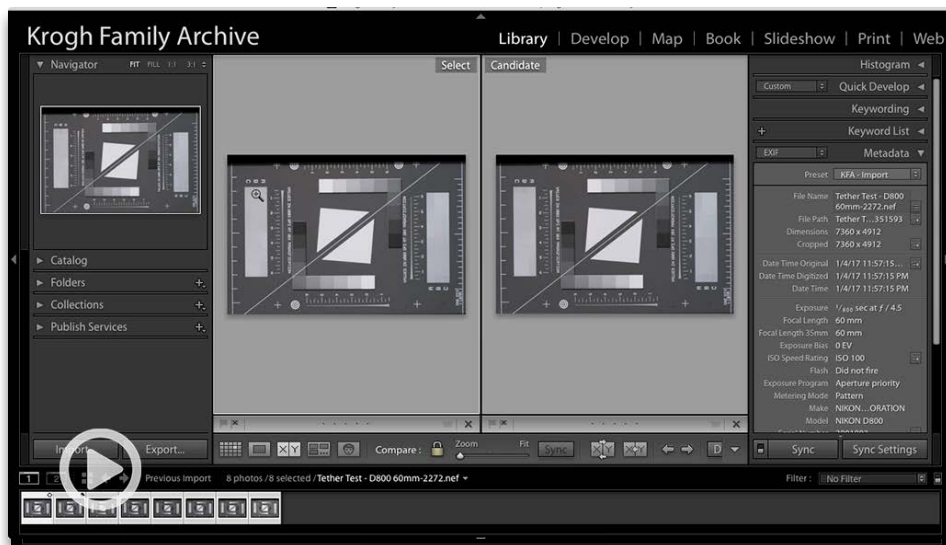
MORE ONLINE

Find out more about monitor profiling gear and monitors that can be calibrated:
www.theDAMbook.com/dyp/monitors

FIND YOUR OPTIMUM APERTURE

Every lens is sharper at some apertures than others. In most cases, the sharpest aperture is 2-4 stops smaller than the widest (e.g., a 50mm 2.8 lens will usually be sharpest somewhere between f/5.6 and f/11). The only way to know for sure is to test your lens. Once you've gotten the camera parallel, you can run some tests.

Scanning at close-up range will generally reveal more defects in your lens than scanning larger objects. So your critical testing should be run on the smallest sizes you will scan, such as 35mm film originals.



VIDEO 6-1 FINDING THE SHARPEST APERTURE (3:35)

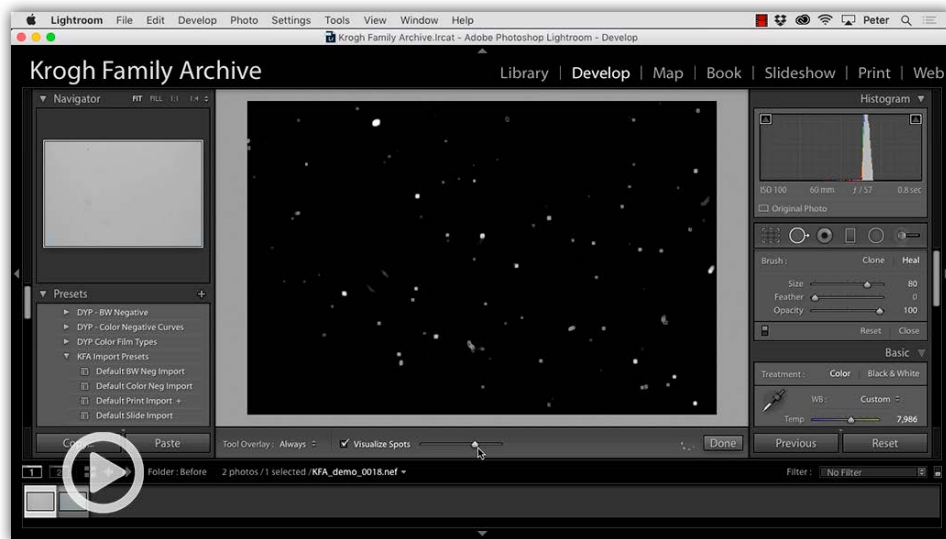
This video shows how you can run a test to determine the sharpest aperture of your lens.

Here are the steps:

1. Purchase a target image or select a photo with fine detail to use as a test image.
2. Shoot a photo at each f/stop, being careful to focus properly.
3. Import into Lightroom and view at full size.
4. Make a note of which ones are sharpest. (Note: you can see the aperture listed in the [Metadata](#) panel.)
5. Make sure to check the focus across the entire frame. If the camera is parallel, it should be pretty even.
6. If focus changes from side to side or top to bottom, then the camera or lens may be damaged.
7. If focus falls off at all corners of the frame, consider using a better lens.

CHECK SENSOR FOR DUST

Cameras with interchangeable lenses are vulnerable to dust and dirt on their sensor. This will cast a shadow on the sensor, showing up as a black/dark spot on positives and a white/light spot on negatives (after processing). You'll want to make sure that your sensor is clean. If it's not acceptably clean, you'll want to clean it or have it cleaned. The video below shows how to do this.



VIDEO 6-2 CHECKING FOR SENSOR DUST (7:23)

This video shows how to check your sensor for dust and how to clean it if necessary.

Here are the steps:

1. Point your camera at an even, white surface.
2. Set the camera to the smallest f-stop the lens allows. Set the shutter speed so that the image is a bit overexposed.
3. Set the camera to manual focus and make sure the subject is not in focus.
4. Shoot a photo at this aperture and at your optimum sharpness aperture.
5. Open images in Lightroom. Zoom to 100% and carefully check for dust and other dark smudges.
6. If you see objectionable dust, first try to blow it off.
7. Check the lens for dust using a flashlight.
8. If the dust remains, you can use a sensor cleaning kit, or send the camera out for cleaning.

**TIPS****Not every piece of dust will show up**

Our method to check emphasizes any dust or dirt on the sensor, even dirt that will not show up in most copies. Before sending your camera out for cleaning, you might want to see if the dust you have identified shows up in actual copies. Make sure to compare what you are finding at the smallest aperture with what you see on your optimum aperture.

Reduce mirror vibration

When the mirror in your DSLR camera raises, it causes vibration, which can reduce sharpness. There are a few ways to reduce this vibration, depending on the camera make and model you are using. On my Nikon D800, I set the camera to delay the shutter actuation for a short period of time after the mirror lifts up. I have my camera set to a three-second delay.

Cross polarize to remove silvering

As I outline in [Chapter 2](#), you'll want to cross polarize if you have prints that exhibit silver mirroring.

SETUP AND QUALITY CONTROL FOR PRINT COPYING

Now let's take a look the quality control we can use in the setup for copying prints. We want to do the following:

- Set the camera parallel to the copy surface.
- Find the optimum aperture.
- Make sure the light is even.
- Check for camera reflections.
- Set proper exposure.
- Use a target to help ensure quality.
- Check color balance.
- Create a custom camera and lens profile.

IS THE CAMERA PARALLEL TO THE PRINT?

You'll want to make sure your camera is parallel to the base of the copystand. If the camera is tilted in one direction, you will get "keystoning", where the image will look like a trapezoid. If the camera is tilted in two directions (front-to-back and side-to-side), it's even worse, you get a trapezium. While you can fix this in Lightroom or Photoshop, you'll want to avoid it if possible. And the lack of parallel will mean the entire print is not in focus. Shooting into a mirror is the easiest way to confirm that your camera is parallel to the copystand base.



VIDEO 6-3 LEVELING THE CAMERA (1:24)

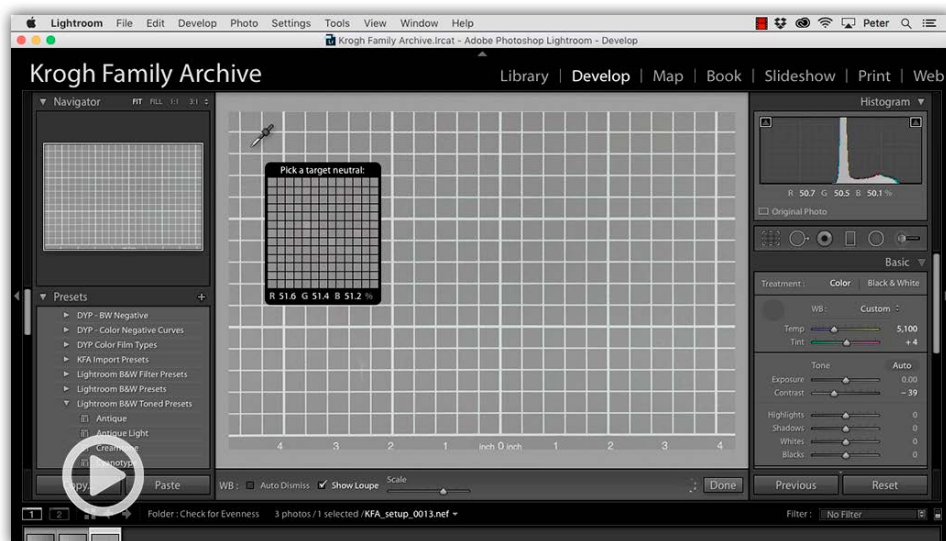
This video shows how to use a mirror to set the camera parallel to the copy base.

Here are the steps:

1. Place a mirror on the base of the copystand.
2. Look through the camera: if the lens is in the exact center of the frame, the camera and base are parallel.
3. Adjust the camera mount or copybase, if necessary, to center the lens in the frame.
4. Confirm by shooting a photo of graph paper or other grid and checking in Lightroom.

MAKE SURE LIGHT IS EVEN

You'll want your light to be even across the entire frame. It probably won't be perfectly even, but you want to make sure it does not have objectionable variations. Museum-quality standards call for one percent or less variation. If it's within ten percentage points in Lightroom, you probably won't see any variations in most photos (or you will be able to make corrections for important photos in post-production). You also want to make sure that you don't have objectionable reflections.



VIDEO 6-4 CHECKING FOR EVENNESS (2:21)

This video shows how to measure RGB values in Lightroom to ensure even lighting.

Here are the steps:

1. Place an object with even mid-tone color on the copy stand. My copystand has a gray base, so I can use that.
2. Shoot a photo, and import into Lightroom.
3. Use the dropper and RGB readout to check the brightness of various patches. Most readers should look for mid-tone measurements to be within five percentage points or so.
4. Also look for color balance differences.
5. Adjust your lights as necessary to create even illumination.
6. Repeat until you have it right.



Figure 6-2 Black foil is useful for masking off light falling on unwanted places.

CHECK FOR CAMERA SHADOWS OR REFLECTIONS

The light falling on your camera stand base may also light up the camera itself. This can produce unwanted reflections in glossy surfaces. You need to check for these and adjust your lights as necessary. You should also check for a silhouette of the camera in reflections, as well as extraneous light falling on the camera stand base.

You can use black tape to cover bright parts of the camera or copystand, and black foil to help mask off unwanted light falling on the camera. It's lightweight, inexpensive and easy to work with.



VIDEO 6-5 CONTROLLING FOR CAMERA REFLECTIONS (2:56)

This video shows how to make sure you're not getting unwanted reflections of your camera, and how to eliminate any you find.

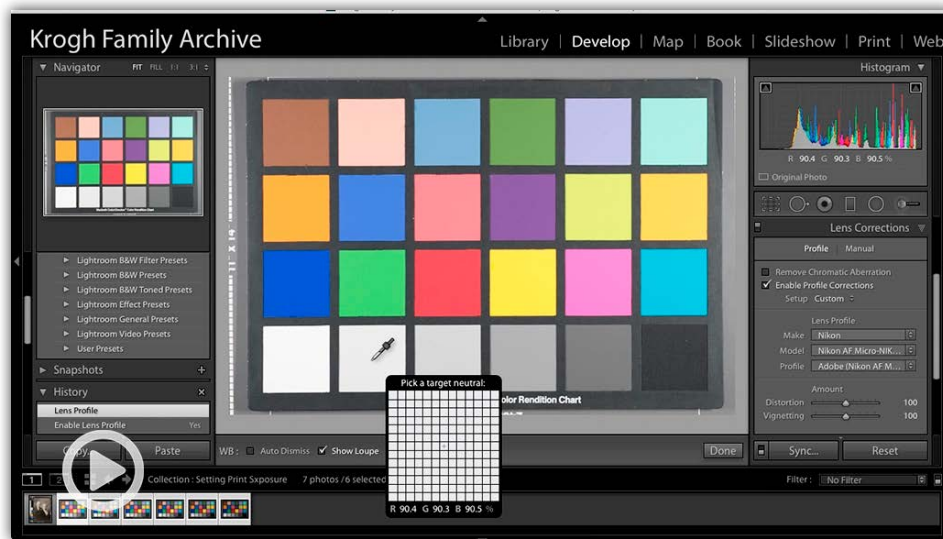
Here are the steps:

1. Place a piece of black paper on the copystand base and cover with a piece of glass. Use a piece equal to the largest size you expect to copy here.
2. Shoot a photo at your normal exposure.
3. Open in Lightroom and examine. You should not be able to see any camera reflection.
4. If you do see a reflection, adjust your lights so you don't see the reflection. You can also use black tape to cover bright parts of the camera or black cardboard to shield the camera from the light.
5. Also look for a silhouette of the camera in the ceiling. If you see one, you need to make sure that there is less light hitting the ceiling.

SET PROPER EXPOSURE

Any modern digital camera shooting raw format will give you tremendous exposure latitude when copying prints. The sensors are built to capture scenes in the real world, where dynamic range – the difference between lightest and darkest parts of a scene – are much greater than you'll typically find in copywork. Nevertheless, it's good practice to set a standard brightness for your copywork. The best way to standardize is to use a color target made specifically for this purpose.

The X-Rite 24-patch ColorChecker Classic is a commonly-used reference target for image quality control, and I suggest getting one to use in your copy workflow. It can be used to determine exposure. It's also useful for setting color balance and for camera/lighting calibration.



VIDEO 6-6 SETTING PRINT EXPOSURE USING A TARGET (3:25)

This video shows how to use a target to measure proper exposure.

Here are the steps:

1. Put the color checker on your copystand and shoot a photo.
2. Open the photo in Lightroom and examine – you want the second lightest gray patch to read 75%.
3. If the number is higher, decrease exposure; if lower, increase exposure. Bring it as close as you can using 1/3 f-stop increments, which should allow you to get within five percentage points of 75%.

QUALITY CONTROL TARGETS

The most widely used target for shooting is the X-Rite 24-patch ColorChecker Classic. The traditional one is 8x12 inches. There is also a pocket version called the X-Rite ColorChecker Passport Photo, which is useful when shooting on location in unusual light (such as an indoor arena or manufacturing plant). These targets can be used for white balance, exposure confirmation and building custom camera profiles. Here are a few others that are useful.



Figure 6-3 The X-Rite 24-patch ColorChecker Classic or Passport can help you set proper exposure and white balance. It can also be used to create a custom camera profile as outlined below.

The AIC PhotoDocumentation Target (AIC PhD) is attached to a magnetic strip that can be included in a photo to provide a permanently embedded color reference. It is a common tool in museum photo departments. The version shown here is being redesigned slightly.



Figure 6-4 The AIC color target can also be used to set exposure and has the advantage of being easy to include in your copy photos for future color reference.

The IT8 targets are typically used to calibrate scanners. As you can see, they have considerably more color patches than the X-Rite. IT8 targets come in reflective and transparency versions. They are a valuable tool if you are using scanner software that supports calibration with IT8. Software includes VueScan and SilverFast.

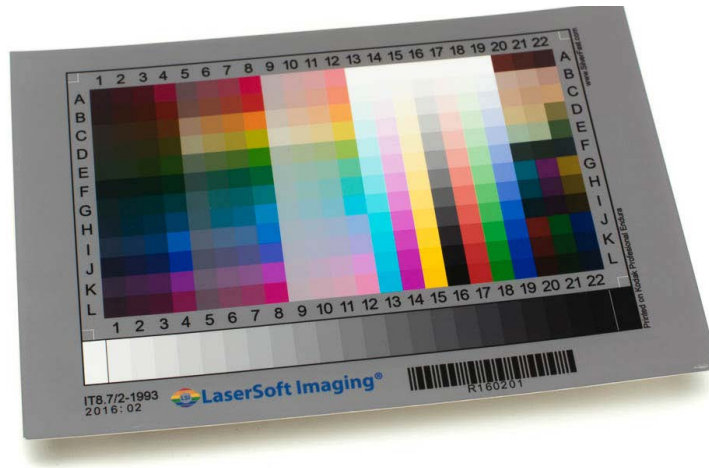


Figure 6-5 IT8 targets are a standard for scanning prints and slides with conventional scanners.



MORE ONLINE

For more info on where to purchase targets:
www.theDAMbook.com/dyp/targets

CUSTOM CAMERA PROFILE

Lightroom allows you to create a custom camera profile for shooting prints and documents. This is not necessary for everyone, and is generally not useful for slides and negatives. Lightroom gives pretty good reproduction right out of the box, but anyone who wants the most accurate digital scans possible will want one of these calibration files.

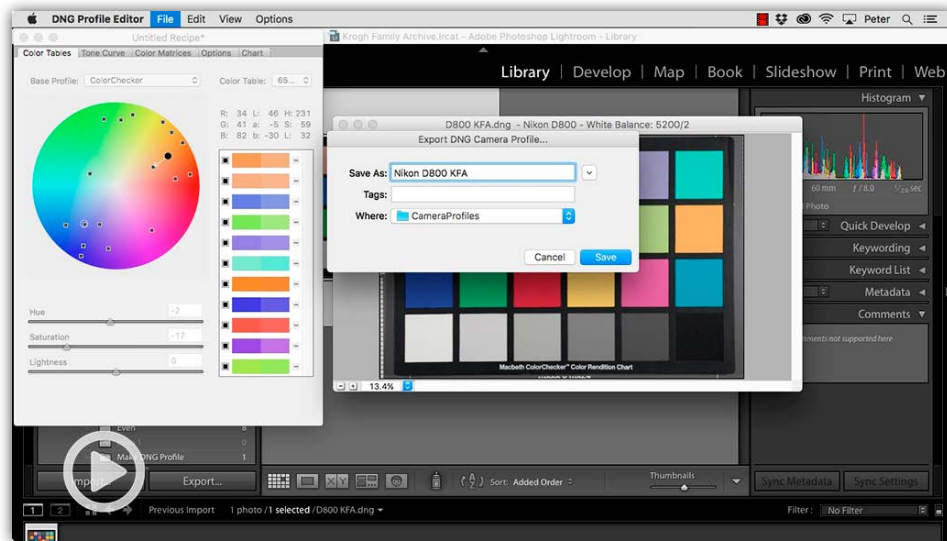
What is a custom camera profile?

The custom camera profile is a calibration file that compensates for the specific color signature of your camera, in combination with the light source used. It allows Lightroom to render the copy photo as closely as possible to the original photo.

Note that some people may be more interested in a pleasing reproduction, or restoration of lost colors than strictly accurate reproduction. But even in these cases, the camera profile gives you an accurate starting point for your restoration – one that you can return to later for comparison.

Creating a custom camera profile

There are three steps to making a custom camera profile. Shoot a photo of a 24-patch color checker on your copystand, run it through software to make the profile, and install it into Lightroom. The video below shows the process in action.



VIDEO 6-7 CREATING A CUSTOM CAMERA PROFILE (6:02)

This video shows the steps for creating a custom camera profile, including the shooting, processing and installation.

Here are the steps:

1. Shoot a photo of the color checker under the light setup you will be using for copying.
2. White balance on the second-to-lightest gray patch, and adjust camera exposure until the unadjusted value is close to 75% (reshoot if necessary to get the proper exposure).
3. Convert photo to DNG.
4. Download and install the free Adobe Profile Editor.
5. Open the DNG file into the Profile maker and choose [Chart](#).
6. Make sure the color dots in each corner of the checker are properly placed.
7. Create the profile.
8. Save profile named for the camera and lighting setup.
9. Add to Lightroom.
10. Quit and restart Lightroom.

SETUP AND QUALITY CONTROL FOR SLIDES

We'll start with camera leveling and then move into color and tonal control.

CAMERA LEVELING WITH COPYSTAND

As with print copying, a mirror can be used to confirm that your camera and the film plane are parallel. However, you'll probably need to back the camera away from the film stage in order to see it in the mirror. For this reason, it's important that you have a sturdy column on your copystand. Depending on the design of your copystand, you might find that it's easier to adjust the height of the film stage rather than changing the tilt of the camera.

Rail systems and lens-attached will generally not need camera leveling if they are designed properly.



Figure 6-6 You can use a mirror to set camera alignment. Adjust the camera until the mirror shows in the middle of the frame.

COLOR AND TONAL SETTINGS

Lightroom does not have the same capabilities for color matching slides that it does for photographic prints. There is no real equivalent of target profiling that does the same level of color correction shown above. And, because film emulsions have such different color signatures, any solution would require color calibration slides for many film emulsions.

For most readers, this will not be a huge problem. With a little work, we can make a nice color-balanced copy of the image that is reasonably faithful to the original. It can also be optimized for color and contrast to improve on the original. And color shift in processing, as well as fading of the original slide, can all be fixed pretty easily.

Most readers will probably find it perfectly adequate to judge color accuracy by comparing the image on your monitor with a slide on a color-balanced lightbox. That will give you an excellent starting point that can be improved with post-production, in the same way that slides have always been tweaked in print reproduction.



DIGGING DEEPER

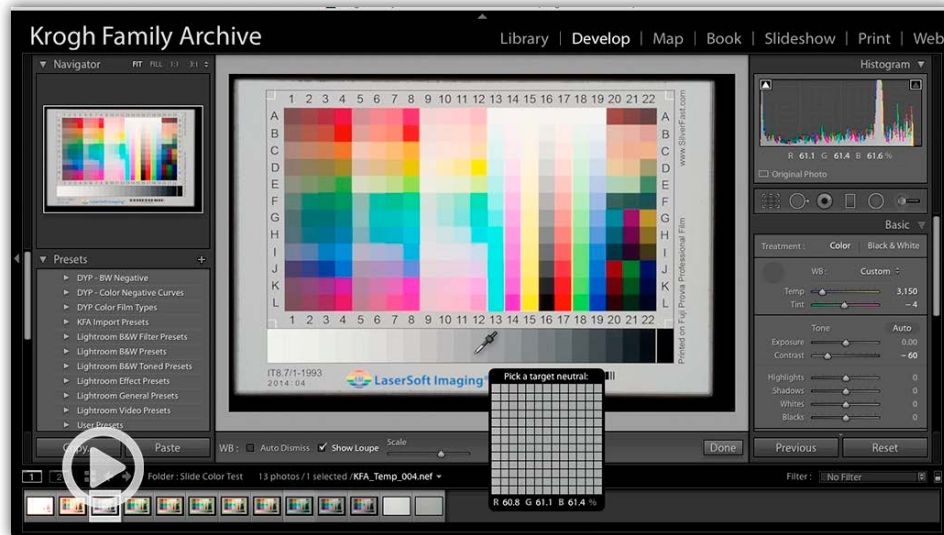
When accurate color is a must-have

For certain applications, it's important to have very accurate color reproduction of the original transparency film. This might be for museum use, forensic analysis or some other scholarly or legal reason. The gold standard for this is probably Capture One CH, which is very expensive software designed for museums, and paired with very expensive hardware. On a significantly lower budget, you can use an IT8 target paired with SilverFast software to run a calibration routine. SilverFast will close off many of the significant workflow advantages that I describe in this book. And any color accuracy will go out the window once you start to compensate for color fading or improve contrast for better reproduction.



WHITE BALANCE

Our white balance has two different components: the color of the backlight and the raw conversion settings. We want the color of the light to be similar to daylight, and we need to tell Lightroom to neutralize any color cast. I suggest using an LED, a photo flash, or a dichroic light source for your backlight. (Fluorescent can be used but is not ideal unless you use the less common Triphosphor tubes.) You can check the color by shooting a photo into the light source and examining the image in Lightroom.



VIDEO 6-8 MEASURING COLOR TEMPERATURE IN LIGHTROOM (4:46)

This video shows how to measure color temperature in Lightroom. You should be looking for something in the 5k to 65k range.

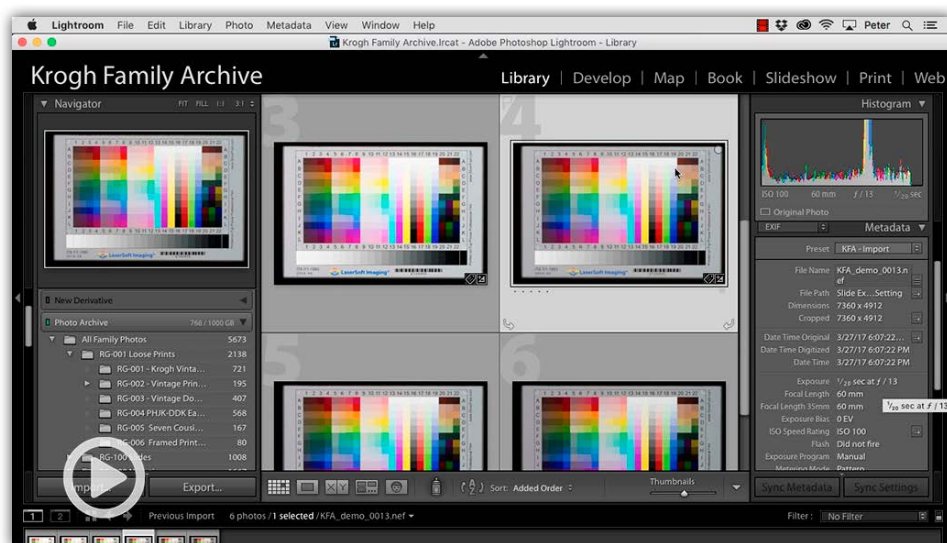
Here are the steps:

1. Shoot a photo looking straight into the light source. You'll want the resulting photo to be gray instead of white. (If you have a color slide target, you could use that and measure a neutral gray patch.)
2. Open the image in Lightroom and set **WB** to **Daylight**. The image should have only a minimal color cast.
3. Click the dropper to neutralize the image. Neither the **Temperature** nor the **Tint** slider should move very far.
4. If you are using an adjustable color source like a dichro head, adjust your color so that there is no color cast.
5. This will be your default white balance, and should be added to a slide develop preset.

EXPOSURE

You can use a color target to help you set exposure. But if you don't have a target, you can also shoot a few different types of slides to help you find your default exposure. We'll be looking for an exposure that captures the maximum amount of information. And we'll want the captured tones to be in the sweet spot of the sensor, giving us headroom at both the light and dark ends of the tonal range.

Fortunately, digital camera sensors have a much larger dynamic range than film does, so we can capture the full tonal range with the same exposure setting in almost all cases. (You might want some exposure compensation for severely underexposed images shot on high-contrast film.) The video below shows exposure setting in action.



VIDEO 6-9 SETTING YOUR BASE EXPOSURE FOR SLIDES (3:38)

This video shows how to set a good default exposure that captures the most information and gives you wiggle room in both highlights and shadows.

Here are the steps:

1. If you are not using a target, select a range of slides to test with. Select both underexposed and overexposed images along with ones with proper exposure. Even if you are using a target to set exposure, these are valuable to confirm your capture quality.
2. Your aperture should be set to the one that provides maximum sharpness, so any adjustment should be made by changing shutter speed for continuous light or flash power for flash illumination.
3. If you are using an IT8 film target, you'll want to shoot and adjust your exposure until you see maximum clarity of tonal patches at each end of the scale, *without doing any adjustment to the file*.

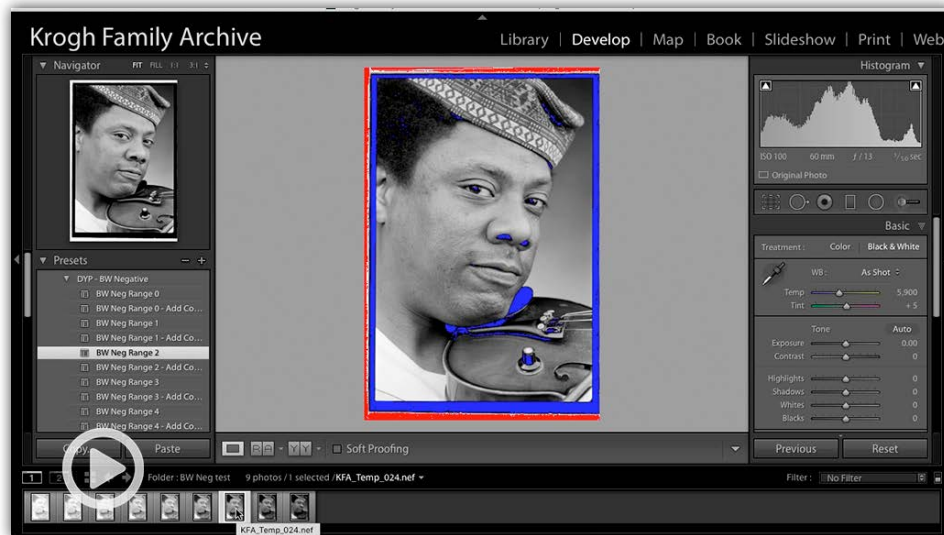
4. You may find that you need to reduce contrast slightly – this is fine.
5. If you don't have an IT8 target, pick a high-contrast slide with a dense black and use that to set exposure.
6. It's useful to keep your test slide handy and check exposure whenever you start a copy session.



QUALITY CONTROL FOR B&W NEGATIVES

Unlike prints and (sometimes) slides, negatives are almost always a medium for image capture, and not the final artwork. Printing negatives is a subjective process where decisions must be made about contrast, tone and color (for color negatives). As such, the process to copy negatives is even further removed from a single accurate rendering than slide copies are. Consequently, our objective is simply to make a good capture of the negative that can be turned positive and tweaked to our liking in Lightroom.

If you have done the process above for your color slides, you're essentially ready for black-and-white negatives as well. Your slide film exposure should work for most negatives, but may need adjustment for very dense negatives or plates.



VIDEO 6-10 SETTING BASE EXPOSURE FOR B&W NEGATIVES (2:07)

This video shows how to find a good starting point for exposure of B&W negatives.

Here are the steps:

1. Start with the base or default exposure you determined for color slides back in Video 6-9.
2. Choose a sharp focus, high-contrast negative, copy and import into Lightroom.
3. Choose one of the B&W curve presets (starting with Range 0) and make sure that neither highlights nor shadows clip.
4. Choose higher range numbers until clipping starts. Optimal exposure should start clipping shadows and highlights equally.

QUALITY CONTROL FOR COLOR NEGATIVES

Color negatives throw an extra wrinkle at us that we don't experience with slides or B&W negatives. The film base on color negatives is typically tinted some shade of orange, which will throw the color balance off. If you are using dedicated scan software like SilverFast, the base color is compensated for in the program's algorithms. But if you're going to make a positive in Lightroom, you're going to find an easier processing workflow by neutralizing the film base with your lighting. This is the main reason I like the dichroic light source: it has easy compensation for any film base color.



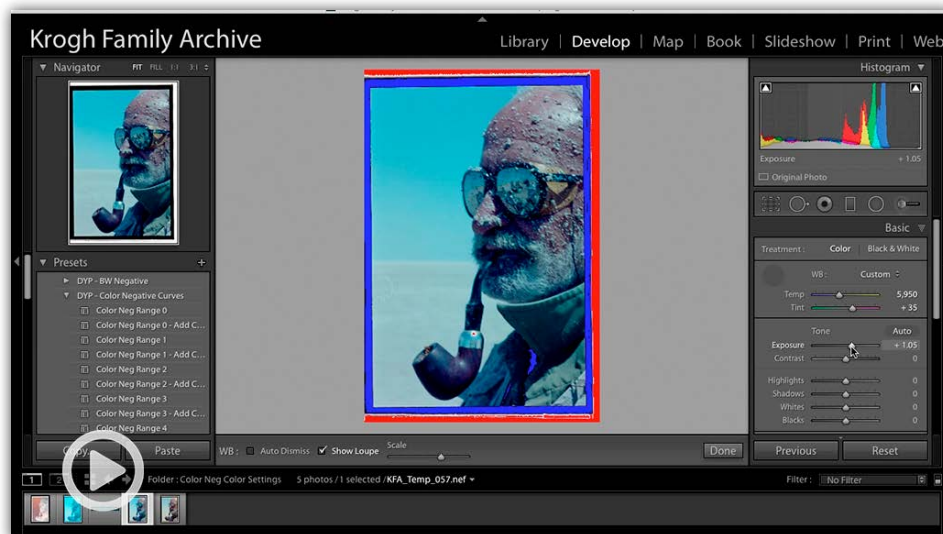
Figure 6-7 These three negatives illustrate the different color bases film stock can have.

To neutralize the film base tint, you need to shoot a photo through a blank part of the film. You could use the leader of the film or a frame line. If you are using a dichroic light source, you can get close by visual inspection and then shoot, measure and adjust.

COLOR NEUTRALIZATION FOR NON-DICHROIC LIGHT SOURCES

If you are using a strobe or standard LED light source, you won't be able to just dial in a new color. But you can use color gels to help neutralize the film base tint. The easiest way to see which color you need to use is to flip the image to positive and make a note of the general color of the base. This will correspond to the color you need to remove from the film base, and hence the color gel you will want to use.

The video below shows how to neutralize film base tint for color negatives in both adjustable and non-adjustable light sources.



VIDEO 6-11 FILTERING TO NEUTRALIZE COLOR PRINT FILM BASE (6:27)

This video walks through the steps to remove the film base color from your scans.

Here are the steps for dichroic light sources:

1. Place film in film stage. Dial in color until you think you have removed the color cast.
2. Shoot a photo of the film where there is no image – underexpose the film slightly to get the color into the mid-tone area.
3. Import into Lightroom, and set color balance to [Daylight](#).
4. Measure with the dropper. Aim for RGB percentage values within five points or so for each value.
5. Adjust and reshoot if necessary.
6. Make a note of the film stock and color settings. Shoot a photo of the clear film base – ideally underexposed a bit.

Here are the steps for fixed color light sources:

1. Open the file in Lightroom and make sure the white balance is set to [Daylight](#).
2. Flip the tone curve upside down.
3. The resulting color is the color compensation gel you should use.