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VIOLIN PHOTOGRAPHY

There are two reasons to shoot photos of violins, for decoration, or for documentation. This article is about shooting for documentation, for which there are specific requirements that most violin experts expect to be met, so that when looking at violin photos from various sources the way the instruments are shot does not become a factor in the process. The industry standard for archive photos is for a violin shot directly from the front and the back, not looking up or down at the instrument (which distorts the relative sizes of the upper and lower bouts) and on a white background. If you look through books, you will see these shots everywhere. Additionally, a side view of the head is usual, and this should be shot in line with the eye of the head, with none of the far side of the head peaking out, looking neither up nor down (this means wasting some space at the top of the frame when shooting, to be cropped out later, since the scroll's eye will be centered in the photo), on a white background. Additional photos of the front and back waist are often shot as well, for details in the corners and f-holes, and these follow the same rules. The first three are the basic shots, the most essential ones if they're done right, and you wouldn't believe how irrelevant it is to receive an envelope of 20 or so shots from a customer or another shop containing none of the above shots.

Violin glamor shots aren't discussed in this article.

It's not necessary to go into hock to photograph violins. For the purpose of taking pictures on the road, I developed a small kit that would do everything I needed, and used it throughout Europe photographing Guarneri del Gesu violins for a book. It fit in one small trunk (9"x13"x36") and two accessory bags the size of small gym bags. The kit I devised was used for many calendars, publications, and photos that appeared in a number of violin books.

This was a small but expensive kit. That was nearly 20 years ago, and today, with digital equipment, I have an even smaller kit that costs much less. All of the photos on the darntonhersh.com and darntonviolins.com websites were taken with the techniques and equipment I will outline here. I have the advantage of having been a commercial photographer before being a violin maker, so I came to the job with a lot of useful studio experience. From that I was able to evaluate what would be necessary, versus what was merely equipment bling, and pare my system down to the essentials needed to do the job properly.

Camera

Twenty years ago for the most important photos I used a 4x5 camera, lots of film holders, exposure meters and other accessories, and those, with a tripod and things to hold the violin occupied the whole of the small trunk. Two strobe lighting kits fit in the two bags. Now I use a Nikon D300 digital camera with Nikon's 60mm micro lens (or the 18-135mm zoom that came with the camera), and a smaller tripod. I use that particular (and expensive) Nikon because I'm a photo geek, but one of the much-cheaper beginner's models (say, the D40X, costing around \$700, with an adequate zoom lens included), would do equally well. If I wanted to come very close to the day-to-day quality I achieved 20 years ago using a Mamiya 6X7cm camera, I could approach that with one of Nikon's newer 20MB+ cameras.

If I really needed more, I would be using something more complex or expensive, but it's really not necessary. There's a wide-spread perception that the more money you throw into cameras, the better, and that bigger is better, and that big film is the best. This has never been true for this type of work on a number of points, and now with digital equipment it's even less true. The 4x5 camera I carried did give excellent results. Every time I pressed the button, I spent, at current prices, \$6. Each photo required four different exposures, to make sure one was good. That's \$24 per view. The standard number of views I took was five—over \$100 per violin, counting taxes. That's the most obvious mark against big film, but I hope to convince you that digital is better on more counts than just that one.

What are you going to do with the pictures? For 8x10 prints, a digital point and shoot camera costing \$150 today will render an 8x10 print exactly equal to what my 4x5 camera would do, because the extra potential quality of the larger camera would be discarded in making such a small print: an 8x10 print can't show more than a certain defined amount, regardless of how much the camera has captured. For a life-size print of a violin--about 24" long--the point and shoot won't quite handle it, but a 10 or 12MP digital camera will come within reasonable spitting distance of what 6X7cm will do at that size: most people will not recognize the difference, especially at a normal viewing distance. A 4x5 camera is actually overkill for even a life-size violin photo--it gives more resolution than the printing paper can show. Larger formats are even more superfluous unless you're making billboard size photos of your violins. Larger cameras do give more detail if you are especially skilled with them, but you're overspending if you never intend to tap that in any practical use. A 4x5 camera will make a 66" long print at the maximum resolution of the paper it would be printed on. An equivalent print from 8x10 would be about 10 feet long!

Larger cameras bring other problems other than cost. For instance, film flatness, vibration, and focus problems increase greatly with film size. It's difficult to actually come up with the results the equipment promises unless you utilize a number of relatively obscure tricks. Anyway, if you're doing billboards, and you're rich, and you're an experienced photographer, use big film. Otherwise, consider digital, and tailor your equipment to your actual needs. For me, that means a camera which will do an adequate life-size photo once in a while, and 8x10 prints for archives and certs on a daily basis. As a violin maker, it means a camera which will permit me to take unlimited numbers of photos of the details I need to preserve for my work, and digital cameras permit me to take as many shots as I want at essentially NO cost whatsoever, digital photos being. . . free.

I want to head off one thing at the pass, and that's worrying about distortion, quality, and color accuracy. There's not such thing as a "best" lens for the type of work we're discussing. All modern lenses are extremely good, and at the apertures (lens openings) used for this work, their resolution is beyond what the sensor or film can utilize. Even the basic lens on an amateur-targeted camera is wonderful at around f8 or f11, which are the openings we will be using. With cameras the barrier was never the lenses, anyway, if the lenses were properly used, but the abilities of the film. Now the upper boundaries are defined by the digital sensor size and characteristics.

Lens distortion is no longer important, either; modern lenses' distortion characteristics are mapped, and Photoshop (which is the software you will use if you are serious) automatically identifies the lens used, and compensates for the lens' distortion! The only type of distortion you will have to worry about, and the most likely source in any case, is perspective distortions resulting from off-center camera angles and distance. The best solution to these is to use a longer than normal lens, so you can work from a greater distance, and to be extremely careful in setting up the shot. In my work, I often use my zoom lens at around 100mm, which is the 35mm film equivalent of 150mm, giving me a long working distance (about ten feet from the violin). For reference, this would be the equivalent of a 24" lens on a 4x5--something that would be nice to have but that no 4x5 violin photographer would have, and in this respect I am glad to be back to smaller "film" sizes.

You can see by now that I want you to feel really secure using a small digital camera, and you will also understand why most pro work has switched to digital). The micro lens is valuable for detailed closeups that will document things I want to see as a maker, and I often shoot many detail shots, from angles that are more revealing than the normal straight-on view. Often this is done hand-held, on my bench, under desk lamps, as opportunity presents. For this type of work, even the cheapest modern digital cameras

offer close-up features that used to be unheard of on film cameras, at any cost.

Finally, there's color accuracy. Film has always been a problem for all product and catalog photographers. Film has never been made for accurate color rendering: it's designed to make people look good because skin is the color people are most aware of. Consequently, all films shift colors subtly, rendering warm-colored objects untruthfully and enhancing reds. This is a nightmare for someone looking for really accurate color, especially when warm tones and reds are involved, and it's why a lot of the violin photos you see in books are redder than the violins themselves. If normal darkroom/chemical prints are made, this carries through to the print, and can't be easily corrected without affecting all of the other colors. In the film world, when absolutely necessary in the advertising world, this problem was solved by a very expensive and complicated printing process called dye transfer, for which the materials are no longer available. On the other hand, the latest generations of digital cameras offer an amazing range of color options that can be dialed into the camera directly, and my Nikon, with a bit of tweaking in the saturation, color balance, and white balance menus, is giving me results straight out of the camera that need virtually no later color corrections for accurate results.

So what do I recommend? Ideally a 35mm-style digital camera in the 10-14MP range, or more if you're willing to spend the money. Less ideally, if you are not interested in full size (18"x24") prints, you can use almost whatever you have, and I include an example here that was shot with a tiny (fits in an Altoids can), obsolete and simple, point and shoot 4MP digital camera from the digital stone age to prove my point. You should remember the photographer's number one rule: it's not the camera, it's the photographer (that's the corollary of the violin maker's "it's a poor workman who blames his tools"). Whatever camera you get, the lens that comes with it will probably be fine enough for what you need to do. I recommend any of the DSLR Nikons, Canons, and similar top brands if you want to do the best work and money is not an issue. Think of it as an investment for really great travel, vacation, and family pix, if you can't justify it for your violin shop.

Lighting Equipment

Not much has changed in the last 20 years, except that more varieties of the same technology are available, in a wider price range. I started taking violin photos in 1984 using "hot" lights--500W photo flood bulbs in the traditional half-round spun aluminum reflectors. These still work fine, for reasons that will become clear, but through the years I have experimented with a lot of other options. At the top dollar end of things, for instance, my travel kit of yore was based on two portable studio strobes, with four heads, and cost about \$3000.

They were quite expensive, and I never got them to do quite what I wanted, because of the quirks of good studio equipment. Studio lights are designed to give very even lighting, and this causes some problems with violins. In order to avoid reflections in the varnish, you have to find places for lights that not only don't give reflections, but also make the violin look good. The hot lights I had used previously cast a field of light that was brighter in the center and faded out gradually towards the edges of the light field, and I could position the lights above the violin, but point them at the bottom of the violin. The top end of the instrument was closer to the light, but lit by the dim fringes of the light pattern, where the bottom of the violin, farther away, got less light that was compensated by being from the light's "hot spot". This is still a good plan, and I'll show later how it works for the rock-bottom-cost photo setup. A pair of hot lights, complete with stands, costs about \$100.

With professional studio lights I couldn't do this, and had to use four lights, two from the top and two from the bottom, to get even light. Additionally, these were small reflectors, and gave a harsh, problematic light, and strong shadows which were especially obvious on either side of the tailpiece. Multiple lights from opposite directions (top and bottom) have the effect of making the figure of the back disappear to a great extent, and flattening out the whole violin in an unattractive way that never looked real to me, but appealed to the person who was paying my bills. Using white umbrellas pleased him even more because they totally eliminated the shadows, but they so completely wiped out the liveliness of the violins that I just couldn't do it that way. Interestingly, one year a calendar appeared with just one of these umbrella-lit photos. It was my employer's favorite, but a commercial photographer visiting my shop flipping through that year's calendar quickly landed on that very photo, asking "what went wrong here on this one?" Enough said.

When I quit that job I was quick to go back to the hot, two-light combo, and used it for a few years, but still felt like improvements could be made, especially in the direction of color and vibration (always a problem with hot lighting in a tall building with elevators). Eventually I became aware of something that hadn't existed 20 years ago—small, silvered, reflective umbrellas. They're not white, like the usual photo umbrella, but are covered with a type of mirror fabric. With these and studio strobes I was finally able to get a source that was wide enough to give a soft, enveloping light that solved my problems with exposure from one end of the violin to the other with only two lights [I won't get into the inverse square law and point sources, but that's the physics at work here], but which were still harsh enough to make the violin look life-like rather than flat. Currently, what I am using are two Interfit Stellar 300WS mono-lights, with 27" silvered umbrellas. In retrospect, 150WS lights, which are cheaper, would have been adequate, since I usually keep the 300WS units turned down a bit. The total cost for such a lighting setup runs around \$350 to \$600.

There's another type of lighting I've seen recommended, and that's small quartz lights. These are charming little guys originally designed for portable industrial film lighting, and I've seen some nice work done with them, but they suffer the same light-pattern/small source problems I had with my old studio strobes--at their best, they replicate what I was doing 15 years ago for less money. Plus, they're quite a bit more expensive than the spun aluminum bowls, so for a low-budget, hot kit, I still recommend photo-flood bowls.

Tripods

You absolutely need a tripod. Don't even think of doing without. The heavier and stiffer it is, the better. Don't get a flimsy one, don't get one with too many leg sections to reach a normal height. Make sure you get one that allows the camera to pivot for vertical photos. Plan on spending \$60, at least, but you don't need the most expensive thing you can get. Mine is a Manfrotto 055XB with their 056 head, which is a silly and cheap head that does the job exceptionally well. Slik has some nice tripods of about the same bulk that would work fine for half the price. The basic specs you want are a 60"+ tripod with no more than three leg sections and a three-way head; in this case, heavier is better.

Violin Supports

The oldest traditional method of holding a violin for photos is a bit scary. It's done by taking a short board--say eight inches long, and eight wide, and sawing two parallel slots halfway through one face, three or four inches apart. A square of glass is shoved into each slot, sticking up into the air with the edges of the glass facing the camera, and the violin balanced on the two rails of glass edges. This is pretty crude, but it's worked in violin shops for decades, and might have seen the glass in a lot of violin photos without quite realizing what you were seeing.

I once made a fancy bracket that held the violin at the top and bottom, next to the neck and tailpiece, between tiny fingers, and that worked very well and was invisible, but took a lot of machining, and when I passed on the old photo job to someone else, that bracket went to him. Now I use a slightly-advanced version of the two glass sheets, a Mason jar with white masking tape on the edge. The two-glass-sheets method had the disadvantage that since violins are rarely perfect, the best you could hope for was three-point contact, a bit of rocking, and a violin that was rarely truly vertical. The Mason jar permits me to slide the violin around until it doesn't rock, and forward and back until it's perfectly vertical; the tape keeps the violin from sliding around after I've put it where I want it. It's scary, but no scarier than glass rails; it works and it's a slight advance on what other shops are using. . . and I've never had a problem with it. For very valuable violins I use a safety line of dental floss hanging from an overhead microphone boom. I'm currently

designing a new version of the fingers jig, though.

Background

The background needs to be pure white. I use a piece of foamcore board, but anything flat (not a sheet!) will do. Use white even if you don't want a white background, because the time to assign your background color is when you're working in the computer, digitally, on the image. This is because lighting both the violin and the background perfectly evenly is just too complex. You can do anything you want to the background later. About 16 inches behind the violin is a good distance for backgrounds. That's far enough away that you won't have shadows on it, but close enough that it will still come out close to white in the photo, without being so white that it blasts out the camera's sensor.

Setting Up the Shot

There are just a couple of basic rules: the violin must be shot precisely from the front, looking neither up nor down, from as far away as practical. This means, incidentally, that the "film" is perfectly parallel to the subject. This is the only way to get an accurate, distortion-free photo.

Simply put, this means the camera needs to be right in front of the violin, pointed at the center of the length of the violin, at the height of that center of length, assuming that both the camera and violin are perfectly perpendicular to the ground. Likewise, left to right the camera must be looking directly at the violin. The easy way to set this up is so that the lower corners of the top and back are both in the same relationship to each other on the left and the right c-bouts.

That usually works, but sometimes a violin is put together awkwardly, so you have to really get a good handle on where "front" is for each violin. Sometimes the top and back are twisted in length, like a propeller. In that case, you just have to do your best, and find the best average "front".

All of these problems are problems of perspective, and all problems of perspective are lessened by distance. If you had the room, I'd say use a 400mm lens from half a basketball court away, and your results will be more perfect with less care. . . but we're not going to be able to do that, are we? So what you need to do is spend extra time making sure everything is as carefully lined up as you can manage.

Finally, make sure that the shot is framed as tightly as you can manage--leave at most about an inch of white at the top and bottom of the violin; and though you can straighten things later, try to make the picture as straight as you can at this point so there's less to do

later.

Lighting

The first time you do this, you might want to use a crummy violin. Initially you'll be moving the lights around a lot, and you don't want to knock over something valuable. Once you know where the lights go, the next time will be quicker and easier.

My basic starting position for the lights is on either side of the violin, pointed downwards as much as the light stands permit, with the lights at scroll level (move the lights a bit higher if your reflectors don't light up the head from that height). Then move the stands forward until you start to have reflections of the lights off the top (you should look through the camera to check this). Finally, move the stands back only far enough to make the reflections go away. The point is to get the lights as far in front as possible. This will depend, obviously, on the arching of the violin. With umbrellas, the lights will point up to point down, but the same rules apply. That's really all there is to it. The distance from the lights to the violin shouldn't be too close--something like three or four feet away is good.

Exposure

With film, I never knew if I had the exposure right--or even if I had anything at all--until days or weeks later. Consequently, I used a lot of film with different exposures trying to get one that was right on. This is called bracketing, and is unavoidable with film if you want the best results. Now with digital imaging, I can see immediately how things are working, and adjust the camera accordingly.

For exposing, it's essential to be able to use your camera manually. Autoexposure schemes are designed for "average" subjects, and in our case, the white background throws off exposure too much to do it automatically. Any normal metering mode, including believing what the camera tells you in manual mode, will result in about two stops of underexposure, which is basically a fatal error. Before you start figuring exposure, though, you need to do several other things. First, set your camera to its lowest ISO ("film" speed), which is usually 100, or sometimes 50; second, set the white balance to the light source you're using; and third, set the camera for manual exposure. I can't help you do any of these--you're going to have to read the camera manual.

Next, set the lens opening to f8 or f11, or in between if you want. This is the best range for any lens you will find on this type of camera, and will result in maximum sharpness. The precise opening needs to be determined by the lighting you're using. For instance, my studio strobes are bright, so I use f11. When I'm using hot lights, which are dim, relatively, I use f8. If you are using hot lights, you'll be changing the shutter speed to

adjust the brightness of the picture. Probably you'll end up around 1/15sec or so, so start there. With strobes (electronic flash) you'll adjust either the output of the strobe or the lens opening after you take a test shot. For strobes, use 1/50sec--you don't want too fast of a shutter speed because your camera will be wired only to one, and the first will tell the second, with a bit of delay, when it's time to fire. If you use too high of a shutter speed you may get only one strobe within the exposure time. You won't be changing exposure by changing the shutter speed because the strobe flash is so short that the camera's shutter speed is irrelevant.

Take a test shot. How does it look? Too white means you should turn the strobes down (there's a dial on the control panel--be sure to turn them both down the same amount), or close the lens opening a bit (move to a higher number) or, with the hot lights, move to a higher shutter speed (like 1/25 or 1/30). Take another test, and mess with the exposure until the results you see in the preview of the shot you've just taken, on the back of your camera, look good. This is all there is to it.

If you want to take it another step, find how to show histograms on your camera. What you are looking for on the histogram is to set the biggest hump, which will be the white background, just short of the right edge (which is pure white) on the histogram, and to have, ideally, nothing too close to the edge on the left. You don't want anything running off at either end, but since the background is less important and will end up white anyway, you can push things more to the right. In digital parlance this is called "exposing to the right" and what it does is make sure that nothing is "blown out" at the white end while also making sure that at the dark end all values are bright enough to be well separated and clear.

So, shoot the back, turn the violin around, and do the same, but you'll have to start over with everything: alignment, and especially exposure, because violin tops are usually a little darker (by just about 1/2 stop, in photo talk) than backs but we don't want that in the final photos: we want them balanced.

You can shoot a side view if you want, but I don't, since it's interesting, but functionally useless for telling anything definite about the violin beyond showing the figure on the ribs. If you want to extract arching information from side shots, you have to make two separate shots, one biased to show the top arch, one to show the back; you can't get both at once, and the normal side view alignment reveals nothing about either. If you're shooting arching, don't bother including the neck. Be aware, also, that you can't extract a good side view of the head from the side view, because you'll be looking up at the scroll, distorting it. I shoot detailed waist shots showing all four corners of the top and back, and a side view of the scroll; shoot four views if the scroll is on something really interesting and important. On the scroll side views it's important to position the camera so that only

the side of the scroll facing you appears--nothing from the other side peeks out from behind. Usually this means lining the camera up with the bottom of the top turns, and adjusting a bit left to right until you see what you want. Because of the depth of the subject, I crank my zoom out all of the way for these.

Finally, I take measurements. My standards are the left corner-to-corner distance on both top and back, the length of the back, and the length of the scroll. This enables me to print accurate life-size photos later if that's required. A caliper rather than a tape is best for taking these.

Focus

If you use the camera's native autofocus mode, it will focus on the strings or the bridge, or something near the center that's not the right thing. The best place to set the focus is on an f-hole or corner. If you don't know how to move the focus point of your camera around, the easy way is to keep the horizontal adjustment on your tripod loose so that you can pivot the camera sideways until the center focus point is on something with a clear edge (the camera focuses on edges) like the f-hole or an edge, press the shutter release half-way down to fix focus on that point, hold the release there, recenter the picture, and press the release the rest of the way. You will need to do this for each and every exposure.

Post-Processing

A lot of what I shoot doesn't get printed--some of it is just for archiving and record keeping. What does get printed gets done to a consistent standard and layout so that copies can be bound or filed, and that comparisons between violins are easy to perform and meaningful. For this I have a standard layout: on one page, a full length front and back view, printed so that the violin is 9-1/4" high; on the second page (usually the back of the same sheet, so one piece of paper represents one violin), a full-size print of the top waist on the bottom and above it on the left, the back left c-bout only, also at 100%, and on the top right, a full-size view of the E/A side of the head. Above the front photos on the right is all the info about the violin--the date it was shot, the owner, maker, city, and date, and the record number in our other files. These five views are bound in binders with like instruments--all of the Stradivaris together, in date order, for instance. Currently I have about 10 feet of shelf space of these, and many more to print.

I can't teach you here how to use photoshop, but I can give you a few hints related to printing violins in particular. I'm going to assume you're using Photoshop. Otherwise, you're on your own; I don't know any other programs than this universal pro standard.

Start by cropping. Click on the cropping tool (looks like two corners of a picture frame, overlapping) and drag a box over the picture. After you've done that, you can tune it up by moving it by the little (boxes) handles at the corners and on the edges. You can also spin it by the corners to straighten a crooked image. I use the tailpiece and scroll relative to the handles to determine when it's straight. Crop tightly--leave about a virtual inch of space all around the violin. Press "Enter" when you like it. Ctrl-Z negates this change if you don't like it, and does the same to any other change you immediately decide you don't like after you press the "Enter" key to make it permanent. Ctrl-Z is your best friend!

Next, there's the problem of the background color, and it's easy. Start by using a paintbrush, set to about 60 pixels size, 60% softness, and white, and enlarge the image until all you see is the bottle supporting the violin. Paint out the bottle to pure white. Then view the whole image, and click on the background with the magic wand tool set to a tolerance of 20. In one click you might select the whole background, or you may have to hold down the shift key and click to add some unselected areas. Once you have the whole background selected, feather the selection three pixels, bring up the levels dialogue (Ctrl-L), grab the tiny triangle under the lower right corner of the histogram and drag it all the way to the left. Instant white background! Press "Enter", and you're done. Deselect (Ctrl-D). If your selection missed some spots, you can go in now and paint them white.

Finally, there's the exposure and color problem. Open levels again, and click on the left little eyedropper. Click on the blackest of black spots in the photo. This is usually either somewhere in the f-hole, or inside the pegbox. This sets that area to black. If you think the color's a bit off, click the middle eyedropper, and click on the fingerboard. You might have to run around the board clicking here and there until the board truly is grey, but eventually you'll find the spot. Run the middle triangle under the histogram back and forth until you like the way the violin looks. That's about it. If you're still not satisfied, find the hue/saturation/darkness dialogue (image/adjust/), and try moving the hue about three points to the right, and the saturation about 15 to the left.

These last adjustments are things you can also do in the camera, if you can find the right menu, and make the Photoshop part easier, because the images start out more accurate. If you have gross color problems, also look at white balance adjustments in the camera. Because all cameras are different, though, I won't be of much help here.

If you want to take things a step farther, you can start "burning" and "dodging" (to use the film terms) to lighten or darken areas. To do that you find the tool that makes an oval selection (on my Photoshop it's on the top left of the tools palette--click and hold the square, and other options pop out, including the oval). Set feathering to 150 on the menu that appears under the usual menu bar. Drag an oval over the approximate area you want to lighten or darken and bring up the levels menu (Ctrl-L). Move the center triangle under

the histogram back and forth until you like what you see, press "Enter" and Ctrl-D to deselect.

This can go on forever. Stop when everything is perfect. Wow! Cool, huh? Time to save the image. Well, actually that time was quite a while ago, and then every once in a while. If you don't save early and often you can be sure your program will crash after you've accumulated 15 minutes of unsaved edits. Save as a .jpg, using a quality level of around 90. That's not the perfect recommendation, but it's the easiest optimum one for me to suggest.