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The JOBO/Digital Darkroom Workflow

I started using JOBO processors in the mid-80's to make Cibachrome prints. The photography program where I teach, St. Edwards University in Austin, Texas, had purchased several CPP-2 processors the year before to replace a Kreonite machine that never worked dependably. We are still using JOBO processors today.

I bought a CPP-2 after being hired to photograph the renovation of the Texas State Capitol building. (*Illustration #1 - 3 photos, A, B, & C.*)

Note: Each of the images represent a contrast range exceeding thirteen stops. Notice the detail in the deepest shadows and the translucent quality of the high values. Also notice how the halation of the light sources within the image is keep managable. The images were shot on 4x5 Tri-X, rated at an EI of 100 and processed in PMK, with the Jobo and a nitrogen feedline as described in Hutchings book.

I needed a machine that could handle large volumes of 120mm roll film and 4x5" sheet film, and would be able to produce good negatives from scenes with extreme contrast. (The contrast range on the exteriors often averaged 13 to 14 stops.) After much experimentation, the best solution was the JOBO processor (see Sidebar "Taming High Contrast"). The JOBO proved to be consistent, ecologically sound, and much better for my health (no more hands in the chemicals!). I would never voluntarily go back to hand-processing film.

The JOBO exceeded my expectations and quickly became a valuable part of the general workflow of my business. (Because we earn money from every roll and sheet of film that is processed, the JOBO is a valuable revenue source.) When we began offering digital services to our clients, the JOBO was the only piece of equipment that made the transition from traditional darkroom to digital darkroom.

Our digital workflow begins with an image captured on film. It is hard to argue with the quality, versatility, and economy of a well-exposed and processed piece of film.

The JOBO/digital darkroom reduces the workflow from days to hours. After processing, it takes just a few minutes to scan, correct an image, and have it ready to either print or deliver to a client as a digital file.

Ideally, your workflow should be designed to produce the highest quality results within the most efficient time span. Recently, for example, we have been delivering digital contact sheets to clients via email, and high resolution files ready for publication using a URL system on the internet (*Illustration #2 Original in color.*)

Note: The original image was shot on tungsten 120mm slide film using ambient light and strobes color balanced with CTO' gells to match the tungsten color temperature.

Using the internet does not result in a better image, of course; it simply saves our client's time. Commercial photographers who can save time for their clients quickly become the favored few.

The role that JOBO/digital imaging plays in my business is gratifying (anything that makes life easier and increases revenue is a welcomed improvement), but I'm happier still with its effect on my life as an artist. As my business grew, and time became more precious, it became increasingly difficult to find time for the darkroom. Eventually, I realized that a solution was sitting on my desktop, the digital darkroom. Following is an outline of the system that I am now using. You can compare this workflow to your own.

The Digital Black/White Work Flow:

Film is shot and processed in the JOBO.

Contact sheets are made by scanning the negative pages on a flat bed scanner. You do not need an expensive flat bed scanner for this kind of production work (just make sure it has a transparency adapter). Each digital file is labeled with the unique number you placed on the negative page. Using cataloging software, you can organize these files by project, by date, or any other criteria that makes sense to you. These files will be digitally stored in your computer, or on a Zip or CD-rom disk, instead of in a file cabinet. Because digital contact sheets do not require a darkroom, you can do this step at your leisure. You can fit it into other activities and other responsibilities. You can do it while you watch television if you want to! You can start and stop, then start again precisely where you left off. If you operate a commercial photography business, the contact sheet scanning can be done by your assistant or office manager. It is very easy to train someone to do this.

Editing. Edit your digital contact sheets on the computer screen. Because the contact sheet is digital, you can enlarge the individual images. Want to investigate detail and get a better handle on individual images? That is a single key stroke in PhotoShop. Your editing process has just taken a wonderful step forward. If your system is calibrated it is easy to produce the digital equivalent of a "proper proof" contact sheet.

Scan your selects. Depending on your needs, requirements and budget, you might use either the flatbed scanner, or a dedicated film scanner for this task. The price of this equipment is dropping dramatically. However, you can also have the scans done for you. The Kodak Pro CD service is an excellent option. You might want to start this way, and eventually purchase a film scanner later.

Make prints. Having done your editing, and perhaps worked with selects in PhotoShop, you can return to the darkroom and print images conventionally. Or, you can make prints on your desktop with an inkjet printer. You have other options, too. You can have your digital files printed at a service bureau, photo lab, or fine art printing service. It just depends on your needs and budget.

Having spent almost 30 years working traditionally, I can assure you that the technical control available on the desktop far exceeds anything you can accomplish in the traditional darkroom. My decision process about a given image has not changed, but my ability to effect those decisions has changed dramatically. For the first time, I am able to work with an image as completely as I had always desired. (*Illustration #3*) Most importantly, though, I've created

Note: The original negative is a 120mm Tri-X negative exposed at an EI of 200 in available light and processed in PMK, with the Jobo and a nitrogen feedline as outlined in Gordon Hutchings book. The film speed/development charts in Hutchings book give reliable starting points for photographers investigating this methodology.

a workflow that conserves the one thing I value the most: Time.

The JOBO/digital darkroom workflow is the process that I teach in my university courses and at the Santa Fe Photography Workshops. The response from students has been tremendous. They quickly see the advantages of combining the best of the traditional darkroom with the digital darkroom. For students who do not have a darkroom, and have always depended on labs, the JOBO/digital darkroom is truly liberating. For many photographers, seeing an inkjet print emerge from their printer is the emotional equivalent of that magic moment in a traditional darkroom when a print begins to appear in the tray.

It is important to realize that a good inkjet print does not look like a good silver gelatin print, any more than the silver gelatin looks like a platinum. You can still make silver or platinum prints using digital technology, of course. In fact, you can produce enlarged negatives to print other processes, too. I suggest Dan Burkholder's "Making Digital Negatives for Contact Printing" (second edition) if you are interested in these options. The possibilities are endless. The inkjet print is just one option among many, although it is certainly the most cost-effective solution at this time.

Businesses that are well organized and have efficient workflow patterns find it easier to operate profitably. It literally pays to conserve time and maximize efficiency. Photographers face a similar challenge. They eventually discover that time and enthusiasm are their most precious resources. Being efficient means having more time and enthusiasm to do what you want to do: make photographs. The JOBO/digital darkroom workflow may be just the advantage you've been looking for. © 1998 Bill Kennedy.

For information about The Santa Fe Photographic Workshops contact: Santa Fe Photography Workshops, Santa Fe Digital Workshops
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Rotary Processing Kodak 'Tech Pan' Film

by Sam Proud

One of my favorite duties here at JOBO is to talk with customers who have processing questions and exchange processing tips and ideas with them. A recent hot topic has been processing Kodak's Technical Pan film by rotation. By reading the internet news groups you can find many opinions and theories on how to process this esoteric film. Well, as I am always up for a challenge (and an excuse to get into the darkroom) I started keeping track of some of the more frequent questions and theories that were posted on the internet and from our callers. After selecting the points that were mentioned most often, I marched into the darkroom, tank in hand, and started to run some tests to try to separate the facts from opinion.

First, let's take a quick look at Technical Pan film's history. Technical Pan film or 'Tech Pan', as some photographers call it, was first developed by Kodak as a microfiche film for the recording of documents, due to its extremely fine grain and extended panchromatic properties. Later, it was adapted for use in making photographic negatives of line drawings for engineering work. Photographers soon found that this fine grain film allowed them to make extremely large prints from small negatives. Today Technical Pan film is used in a wide variety of applications including micro photography, photomicrography, electron and laser photography. Depending on the application, Technical Pan film can also be used with other developers and other exposure indices. For this article however we will focus on its use in photography with Technidol developer.

Kodak's Technidol developer comes in a package containing 6 foil envelopes, each making 8 ounces of developer. Technidol instructions are written for inversion processing. There are no instructions for rotary processing, so my first job was to find a rotary development time. I shot a test roll at ISO 25 (one of Kodak's recommended speeds), and used an uncalibrated step wedge as a reference target. I then developed the film in Technidol that had been mixed using distilled water, and plotted the step wedge density readings using a ColorLine 5100 analyzer as a reference densitometer. With no recommended times for rotary processing, an educated guess was needed. I checked the instructions packaged with the film. The recommended development times were between 5 and 11 minutes. I split the times and picked eight minutes as a starting time. I processed my first test and read the density values and made my adjustments accordingly. After several clip tests, I found that a 10 minute development time produced the most constant plots for rotary processing for my equipment and darkroom. I used these readings as my base reference for all the other tests that I conducted.

The reason I chose distilled water to mix my chemistry was based on the advice of other photographers and is explained later. As darkroom conditions and individual processing habits vary, I suggest you use a 10 minute developing time as a starting point for your own tests to see what works best for you in your darkroom.

With an established development time, the next question to address was, "What rotation speed should be used?" Technical Pan film is a high contrast copy film and many photographers feel it's best to process Technical Pan film at the slowest speed possible to avoid an increase in contrast. I processed two different batches with my CPA-2 processor, one at the recommended 65-75 RPM (P speed on a CPA-2 or CPP-2) and one at a slower speed of 25 RPM (F speed on a CPA-2 or CPP-2). Running at the slower speed produced a slightly overall lower density and contrast, it also produced streaking on the film. For this reason I will recommend and stick with the higher speed of 65-75 rpm.

It was highly recommended throughout my research on the internet, and input from customers, to use distilled water rather than tap water for processing Technical Pan film. For some time I had heard from our customers that distilled water produced the most consistent results when using Technidol developer. For this reason I used distilled water to determine my development time and used the density readings as my reference of measurement. As a rule, most developers are formulated to work in all types of water conditions, and provide consistent results.

I was curious to find out if distilled water, as opposed to tap water, made a significant difference in the density of the processed film. I decided to run some tests to see what effect tap water had on processing Technical Pan film. To conduct these tests, I asked several of my coworkers to bring a sample of water from their home. I mixed the Technidol with the water they provided. The films were then developed for ten minutes at 20°C with a five-minute presoak. I compared them to my reference strip. I found not only density increases in the film processed in tap water, but significant density variations between water samples.

The next step was to see if I could obtain repeatable results using tap water. I ran the same test using water from my own darkroom. I then repeated the test 6 days later. I found there were changes in density, but not to any significant degree. For the final part of the test, I ran a second film using two different brands of distilled water bought from a store. I compared my two tap water test films to the two test films developed with distilled water. The results showed that while the tap water was close, the distilled water density reading matched even more closely. It seems that distilled water is really the best choice for consistent processing of Technical Pan film in Technidol.

Asking the question, "Presoak or not to presoak?" is like asking 20 scientists which came first, the chicken or the egg. My personal choice, with few exceptions has been to presoak film for five minutes. To my surprise I found that a presoak increased the density of the Technical Pan film. I

wondered if omitting the tap water presoak would change the results. All the film tested without a presoak showed a decrease of density.

After spending a couple of nights in the darkroom, I can say that Technical Pan film is a wonderful film to work with when speed is not the issue, but fine grain is. So using distilled water for a five minute presoak and for mixing the Technidol developer, a ten minute developing time at 20°C, at the standard rotation speed of 65-75 RPM, will yield excellent negatives. Properly used and processed, it can produce negatives that will result in wonderful prints. There will be a couple of rolls in my camera bag from now on.

Kodak, Technical Pan, and Technidol are all registered trademarks of the Eastman Kodak Corporation.

Some Suggestions Before You Go Back Into the Darkroom

by Ken Owen

During the summer, many of us have been away from our darkrooms, and have been outdoors shooting more pictures, vacationing, traveling, etc. Now it's time to get your darkroom back into shape before you begin any work. Here's a collection of thoughts to help you get organized as you get back to serious darkroom work this Fall.

I wish my darkroom had You can fill in the blank for yourself. It might be more space, fewer light leaks, shelves to hold the stock chemicals, or maybe a better way to store the carriers or lensboards for your enlarger. Start now before you get into your "heavy" season of darkroom work and do that construction, or make that improvement so you can enjoy it the rest of the year. Once you have begun serious darkroom sessions, you won't want to stop to clear up part of the room in order to make those changes. But if you make them now, you'll be able to enjoy them the rest of the year, making your darkroom time that much more pleasant.

Stretch a little... If you can possibly afford it, buy that piece of hardware you have been lusting after for years. Maybe it's a new analyzer, or enlarging lens, or easel, or archival print washer. If you find yourself constantly thinking about that piece of equipment that will dramatically improve your darkroom experience and make you more comfortable, or improve the quality of your work, then you probably need it.

Clean up your enlarger — When was the last time you took your enlarger apart, dusted it out and made sure it was really clean? If you can't remember, then it has definitely been too long! Open up the bellows area and dust it out. *Carefully* remove the condensers and clean them too. On dichroic enlargers, clean the mixing boxes. Be very careful around the dichroic filters. Probably a blast of canned air will be best here. Check inside the lamphouse and make sure its clean too, but disconnect the power cord before you go in there. If you dare to use a vacuum cleaner on any part of the enlarger, be very careful. You could easily damage the bellows from the suction. Don't forget to clean your enlarging lens, both front and back. When you're reaching for the aperture ring in the dark, it is easy to get your fingerprints on the lens.

While you're in a cleaning mode, work on the rest of the darkroom too. This would include those corners accumulating all the stacks of negative pages and old

chemical instruction manuals. Put them into binders and get them organized so you can find them when you need them. If you have water filters, change them now too.

Check all your chemicals. Maybe during your hiatus from processing, some of them may have expired. Toss them out. You won't get your best images with outdated chemicals or paper. Make sure when you open a new bottle of chemistry that you date it, so you'll have a good idea of when you'll need to toss it out. Examine the inside of those now empty chemical bottles. If you can't get them clean, replace them! There's no point in having contamination ruin your chemicals. Even if you use them for the same type of chemicals as you used to, they may have accumulated precipitates from the old chemicals, that can accelerate the demise of the next batch. If you don't work with clean bottles you can go broke trying to save money, because you'll have to throw out chemicals that died prematurely. Take it from this cheap old Scotsman.

Check the date on your paper. Especially with color paper, age can prevent you from making good prints. Even B&W papers lose their ability to deliver a full contrast range or a rich strong black tone. Lately it seems as though the paper companies aren't putting any expiration dates on their packages, at least not in any obvious way. Write down the date that you purchased your paper, right on the box itself. It's also useful to write other helpful information on the box, indicating normal filter packs, analyzer reference numbers, standard exposure times, whatever might relate to this package and its contents.

Try three sets of graduates. If you have the space and the money, one further way to avoid contamination problems with mixing new chemicals, is to have 3 sets of graduates for mixing. Label the first set for B&W developer. Label the second set for Color developer. Label the third set OTHER. Only mix B&W developers in the first set. (I'll bet that surprised you.) But that also includes the first developer in E-6 and R-3/3000, and the developer used in Ilfochrome positive print processing. In the second set, only mix color developers such as those in C-41, E-6 color developer, R-3/3000 color developer RA-4 color developer, etc. In the set marked OTHER, mix everything else. Doing it this way nearly eliminates any chance of contamination. In my home darkroom, I have dowels mounted in a board around the top of the room just below the ceiling to hang the graduates after rinsing them out, and for storage.

If your processor is stained or dirty, clean it. It's just more pleasant to work with clean equipment than grungy, stained, or dirty junk. It's a little like washing your car; it almost feels like it runs better after it's washed. We sell Processor Clean II for slow and gentle cleaning and we also have Tetenal Colorlab Cleaner for faster, spray-on wipe-off results. Just DON'T use chlorine in any of the JOBO water baths, or you will damage your heating elements, and that could mean a trip to the repair department.

Check all your darkroom equipment. Is it in proper working order? Are the lenses clean and clear, or is there a fungus growing inside the lens? Are the aperture settings moving smoothly? Is your timer working properly? Has your safelight filter faded? (See last issue, #JQ9902, for details on testing your safelight.) Is your water temperature control panel in proper working order? Do you have instructions for all your chemicals? Go over everything as though you had never seen it before. Look at each item as though you are standing in a swap meet. Decide if this is an item you want in your darkroom. If the answer is yes, good. Go on to the next item. If the answer is no, stop and ask yourself why? You liked it enough at some time in the past to add it to your darkroom. If you still say no, then get rid of it. The point of all this is to make sure the equipment and environment that ultimately controls the quality of your prints, is conducive to creativity. Make your darkroom work *FOR* you, not *AGAINST* you. Then when it all seems in order, get in there, enjoy it and use it. Remember all this is supposed to be for your enjoyment, even if you make your living at it.

Taming High Contrast in Black & White Photography

By Bill Kennedy

Experienced black/white photographers, especially those trained in the Zone System, know that the problem with compacting the exposure scale (using minus development with film to control a high contrast scene or subject) is not contrast per se. It is relatively easy to reduce overall contrast.

The real problem is an aesthetic one. When the contrast range of an image is compacted, the tonal scale will look muddy. All the exposure values may fall into predictable Zones, but reducing overall contrast also reduces local contrast. The more you reduce the overall contrast, the muddier the tonal scale becomes.

Local contrast accentuates and reveals nuance and texture. It is very important to the look and feel of an image. The normal "cure" involves printing the negative on a higher contrast paper. This helps the overall contrast, but also tends to push the high values back up the scale, thereby partly negating the original intent of the minus development. This is the print maker's equivalent of being "caught between a rock and a hard place". Traditionally, solving this problem means learning to make delicate trade-offs between local contrast and overall contrast. It requires patience and a sense of humor to find the right film and developer combination for the work you do most.

An additional consequence of high contrast images is halation of very bright values. Light accumulates extremely fast in any area that is very bright, especially any light sources within the image. Lamps and windows are typical examples. Halation causes a "bloom" effect that literally dissolves away the edges of anything adjacent to the light source (window frames and the detail in light fixtures, for example).

When faced with extremely high contrast, the best combination I have found is Tri-X processed in PMK developer. Tri-X allows for generous exposure (the architectural examples that accompany the main article were exposed at an EI of 100) and, in combination with PMK, does a decent job of minimizing halation. PMK does an exceptional job of maximizing local contrast while reducing the overall contrast to a manageable, and printable, range.

Good starting points for your own work can be found in Gordon Hutchings's "The Book of Pyro ". I generally consult Mr. Hutchings's process time charts, add a minute, and get black/white negatives that print well with the color head on my enlarger.

Of course, you can do film speed tests, development tests, paper calibration exercises, and literally fine tune your system "by the numbers". If you enjoy this kind of work (or just need to justify the expense of that densitometer you bought!), by all means do it. My preference, and the method that I teach my students, is to identify these characteristics by eye. If your working methodology is well-considered and consistent, you can easily learn to judge exposure control and contrast control by looking carefully at well-made contact sheets and prints.

The Book of Pyro, by Gordon Hutchings.
Photo-Eye Books and Prints
376 Garcia Street
Santa Fe, New Mexico 87501

Something 'Reel' Interesting!

Plastic tanks & stainless steel reels, now the best of both worlds come together!

JOBO introduces the #1565 Stainless Uni-Reel 35 stainless steel reel, designed to be used with the JOBO 1500 series tanks and center cores. This new reel allows you to use our leak-proof plastic tanks along with our sturdy new stainless steel reel for hand inversion or rotary processing.

Although JOBO offers stainless steel *and* plastic reels for film, photographers generally have a strong preference toward one or the other. In the past the problem with stainless steel reels was using them in a leaking stainless steel tank or having to purchase a special centercore to accommodate a plastic tank. Using the special centercore with the plastic tank also eliminated the option of hand-inversion processing. All processing had to be done using a processor with the special center core.

What makes this new reel so special is the ability to use the existing plastic center core provided with any 1500 series tank. The choice is yours. Now hand inversion processing in a plastic, leak-proof tank using a stainless steel reel is possible!