



## Issue #21 - JQ9901

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### **Some Observations on Photography and Color Printing**

*By Chris Brown*

I have spent the better part of the past 30 years walking, skiing and rafting around the western US and Alaska, always carrying a camera. I love looking at scenery and I love taking pictures, so I am both a professional sightseer and photographer. Since remote places are my home, I like to think that my photographs show a unique personal insight into the landscape. My photographic process is a meditative one involving quieting myself and opening my intuitive and emotional sensitivities, rather than going out with expectations - which is largely the same as many other photographers'.

I find that I spend more time sitting on rocks and looking at things than photographing, and I want my prints to engage and delight the viewer as the original scene did me. A good print should keep on giving over time (maybe even get better) like a good piece of music. If I become aware when I am printing a transparency that it bores me, it goes into the reject bin. Why would anyone else like it if I don't? A good image continues to excite me every time I work with it; every time it comes out of that processing tube.

I work exclusively from transparencies and make Ilfochrome prints with a Jobo ATL-2. I am largely self-taught in this process, and it has been a struggle to learn to print well. But it has also been very rewarding. Ansel Adams was right, the transparency is like a musical score, and the print the performance. This is increasingly true. Sometimes I don't look at the transparency after I start printing and I am often amazed at how different the final print is from the transparency.

Sometimes I get lost, and have to refer to the original. As I live with a print I learn more about it. I may see shortcomings, or get curious about how it would look with this or that change. My feelings about it change. Every time I print an image it is different: sometimes better, worse, or just different. I find this engaging, like hearing different renditions of a favorite piece of classical music!

Learning about colors has been the most challenging aspect of the photographic process for me. The physiology of how we see colors is astounding, and highly mutable. I see colors differently with each eye, and on different occasions, at different times of day. I may have to live with a print for weeks before I see its "true colors." Therefore I never start and finish a new print in one day. What looks good at 5 o'clock after a day in the darkroom invariably looks off the next morning.

I have devised several little tricks for evaluating prints. The light source I use first is the so-called 5,000 degree Kelvin balanced fluorescent tube. Next I'll walk over to my north light window. If this looks better, then I think about adding more blue to the print. Then I check it out under a quartz halogen spotlight which adds a lot of red/yellow. If the print looks too warm, then I'll adjust accordingly.

I find my eyes either get tired, and shift their balance after looking at prints all day, and these different light sources help me to re-balance. How will the print ultimately be illuminated? Many galleries use the halogen bulb, which will make a print balanced to a 5,000K light look too red. If a print looks good in all lights, then I know I'm in the ballpark. Ilfochromes change a lot under

different lighting, and I find this to be one of their endearing idiosyncrasies. After I get to know the look of a print in my studio I observe how it looks in other settings, on other walls. From this I get to know how my studio situation compares to other settings. I mount almost everything on neutral white rag-board, and this too affects prints, and changes the appearance of a raw print with its black border.

It's so easy to get lost in colors. I have always been confounded working with the Kodak Color Print Viewing Filter Kit; it just never seems that I can find the right color filter to make a print look balanced. What works for me is using them in a backwards sort of way: I look for the filter which makes the whole print have its color cast, and then I correct with the complimentary color! I find it easier to see that a 10cc magenta makes a print overall magenta, than to see that a 10cc green makes it look balanced.

The master printer Christopher Burkett says that there is one best color balance for each transparency. I believe this is true in a general way, but there is also acceptable variation depending on the mood you want to create. I conceptualize all the colors in a circle on a disk, with complementaries opposite, which I am trying to physically balance. When I add one color, it's like adding a weight to that color on the disk, and the colors shift in relation to their up/down movement on the disk. The added color and its complimentary change the most, the others shift less, like marbles moving around by gravity.

When changing my filter pack in the enlarger 5 to 10 cc's doesn't make a huge shift in the print, then I know I am far from a balanced print. When I'm close to the balance point that Burkett talks about then only a one cc color correction in any direction will make a noticeable change in the print. Changes are most noticeable in the mid-to-higher values

I do all my print processing in a JOBO ATL-2, with which I am very happy. Like most every piece of equipment I own, I have had to learn how to work with it. My darkroom is cool in the winter, and I find that I have to start at a higher temperature to make sure my chemistry is at the proper temperature throughout its developing time. This temperature also varies with chemistry volume, and can be tested with water to arrive at a standard procedure.

If you are really curious, you can expose a blank sheet of paper to a solid, light gray value and process normally, and you will probably find some subtle streaks and things created by both the ridges which hold the paper inside the drums, and the depressions between the module sections. Joe Holmes, another fine printer, suggested the easiest solution: line the drum with a piece of thin mylar. Works great! One could also grind off the ridges, but that wouldn't take care of the depressions.

A subtle but distracting aspect of drum processing is a slight color shift from one end of the drum to the other, going from orange at the bottom of the drum to bluish at the top end. This is only/most noticeable in lighter values in some prints. I have no idea why this shift happens, and have stumped both JOBO and Ilford with this situation. To work around it, I put the part of an image I can accept bluer, such as a sky, in the top end of the drum. If you put the sky along the long axis of the tube, you will notice this color shift, especially in clouds. Ilfochromes accentuate everything, and these streaks and shifts may not be noticeable with other printing papers.

Since I print all day, the 20+ minute processing time per print adds up, and I find I'm very happy to be able to spend that time doing other things. While it is expensive initially to buy that time by purchasing an ATL, I've never regretted it! I also process my contrast masks in the Expert film drum, which is quite convenient, and totally reliable. Some day I may explore other types of prints, and it's great to have a machine that will do so many different processes. I've also considered roller transport processors, but to do 20x24" Ilfochrome prints requires a huge

machine which is more expensive than I need given my current print output. Additionally, many processing machines won't handle the corrosive Ilfochrome P-3 chemistry.

One of the keys to color printing is consistency. It is important to do the same thing every time. Once you start thinking about it, there are more variables that you might have imagined. You may think you are only a couple of points off from the perfect print, but if you mix new chemistry, change drum size, have a voltage shift, or whatever, your print may go off in an unforeseen direction and you are back to square one. Since the ATL does everything regularly, it is a reliable source of consistency, and eliminates most variables.

As I tend to go on printing binges two or three times a year, using single use and dump chemistry, as the JOBO does, works well for me. It's not economical to keep a large volume of chemistry current in a big machine, in my situation. I usually store my stock and working solutions in those mylar plastic bags - old wine bags, or new ones from photo stores. Squeeze all the air out of them, which extends shelf life by reducing oxidation. Some of the rubber "spouts" dribble, and so I keep the bag in a box with the spout on the top side, which reduces the dribbling.

Contrast is the devil in Ilfochrome printing; but it is also a gift. As Joe Holmes so correctly pointed out in an earlier JOBO Quarterly article, if you start with a transparency that has higher than necessary contrast, then you can make a contrast reduction mask which puts your low, middle, and high values just where you want them. The extra process is another step to learn and calibrate, but once figured out it can become somewhat systematic. I say somewhat, because each transparency has its own unique characteristics, and I'm amazed at how often I have to figure out a new solution to get what I want from a particular transparency. The Ilford pamphlet on contrast reduction masking, which was largely conceived by Christopher Burkett, is an excellent instruction in basic masking procedures.

With time and patience, and more time and patience, one can make Ilfochrome prints which are very personal, and don't have that "Cibachrome look-alike quality" that is so common in mass-produced prints. As in many technical processes, if you invest your own vision and attention to your work you can create art which is very personal and unique.

## Understanding JOBO's Film Tanks and Drums

*by Ken Owen*

Among the many products we carry, JOBO is really well known for its tanks and drums. In fact the hand-inversion tank is what put JOBO on the map back in the 1920's when Johannes Bockemühl invented the hand inversion film processing tank. Up to that time, roll film was either processed in a hand-line using a basket or completely by hand using a "see-saw" method. That one involves holding onto each end of the film and alternately raising and lowering the two ends of the film so that the entire length of film goes through the solution, in a tray. The hand-inversion tank allowed the darkroom user to turn on the lights while processing film.

Today we all take these tanks for granted. With the spiral reel inside, the film is held comfortably in place and space is provided for the solution to flow through with as little turbulence as possible, providing even processing from edge to edge.

But JOBO has so many tanks and drums, it can get really confusing. Most readers of the JQ already have at least some of our tanks, but you may be just a little confused about the next one you want to buy. Hopefully this article will help clarify what you need to know about selecting the right tank or drum to meet your need.

First of all, about our terms of "tank" and "drum". Just what do we really mean? At JOBO, a tank will use some sort of removable support device inside to suspend film so that the solution can flow through multiple layers of the material. Usually this is a reel. A drum will not have any additional parts to it. Generally it is used with paper or sheet film, and the material is held next to the wall of the drum by ribs to keep it in place during the process. There is one exception to this guideline: our super-format film drums use a format holder to keep the film lifted away from the wall of the drum so solutions can easily flow on either side. But this is only done for sheet film larger than 8x10".

Next comes the question of redundancy. Part of the confusion with JOBO tanks and drums is that there are so many ways to carry out processing. In 35mm and 120/220 films, you can select either the 1501 reel or the 2502 reel. With 4x5" films you can select either the 2509N reel or the 3010 or 3006 Expert drums. As time marches on, JOBO engineers have found new ways to do the same job, and to improve it along the way.

The 1500 series tanks were originally intended to be our hand-inversion tanks, and little else. But they were easily adapted to work with our processors by adding a magnet to the bottom or a cog to the lid. All of a sudden we have a tank system that can grow with the photographer from simple beginnings into any of our manual processors, right on up to our top-of-the-line Autolab ATL-2500.

The 2500 series tanks were envisioned as our "professional" tanks since they could handle film sizes from 35mm on up to 4x5". In fact you can even process roll films and sheet films in the same tank at the same time. Now that's versatility!

To enhance the 2502 reel's ability to process 120/220 film, the JOBO engineers created little pyramids or triangles every half inch or so along the spirals of the reel. This was done to lift the film off the surface of the spiral and to allow better side-to-side flow of chemicals to reduce any chances of turbulence which could otherwise cause uneven processing. The spirals are also close to the outside edge of the reel, and yet they have wider spacing than is found on the 1501 reel, further helping the chemicals to flow through undisturbed. All this was done to keep the agitation virtually identical in each layer of film around the reel, so the innermost and outermost frames would match.

There is an additional benefit to the 2502 reel design, with the spirals hugging the outer edge. If you happen to need a larger volume of chemicals than the reels themselves require (such as when using Xtol or Pyro developers), there is plenty of room for the additional solution.

So which tank system should you select? It all depends on your particular needs. If you will be processing mostly 35mm film, go with the 1500 series. If you are processing mostly 120/220, either system will work, with a very slight edge in favor of the 2500 series. If you plan to process roll film and sheet film and don't want to spend the extra money for an Expert drum, the 2500 system is the answer.

## **QUICK TANK TIPS**

The 3rd digit in any roll film tank number tells you how many reels of 35mm will fit. (A 1520 tank holds two reels of 35mm film.)

If there is a 3 in the 1st or last digit of the tank number, the tank already has a cog attached to the lid and is ready for use on a JOBO Lift. (Such as 3010 or 2523)

If there is a 1 in the last digit of the tank number, the tank already has a magnet attached to the bottom, and is ready for use with the magnet drive system supplied standard on a CPE, CPA, or CPP processor. (Such as 2551)

The 1510, 1520, 1526 and 1540 tanks include one 1501 reel inside.

2500 system tanks never include a reel, since there are so many from which to choose. (2502 - 35mm, 120/220; 2509N - 4x5"; 2517 - 70mm x 5 ft.; 2518 - 2¼ x 3¼" sheet film; 2519 - APS film)

## **Stabilizer and Wetting Agent on Reels**

*By Damon Dean*

One of the often-asked questions at JOBO's Customer Service Department is "Why can't I stabilize, or use a wetting agent while the film is on the reels?" Although this subject is covered in the processor's instructions, it bears repeating here, as the consequences of ignoring these instructions will almost always lead to problems that may not show up until later.

Although we will address both stabilizer and wetting agents (such as Kodak's Photo-Flo) we will use the term "wetting agent" for both, as the wetting agent in stabilizers (with or without formaldehyde) is the actual contributor to the problems that come from improper use.

### ***What does a wetting agent do?***

A wetting agent reduces the surface tension of water. This allows the water retained on processed film to drip off in a smooth sheet. The number of water droplets staying on the film is reduced or eliminated. Big water drops are the prime source for circular "spots" showing on the film as a density shift, and/or white ring of mineral deposits on the base side of the film.

### ***Why shouldn't I do the wetting agent step on the processor?***

As is typical of low surface tension chemicals, wetting agents will foam when agitated. Foam, even wetting agent foam, is counterproductive in the sheeting action performed on the film. This is one reason why Kodak and others recommend no agitation during the wetting agent step. Because JOBO's rotary processors are constantly agitating the solution in the developing tank, this would produce large amounts of foam (much like a washing machine with too much soap!)

### ***Why shouldn't I leave the film on the reels with the tank off the processor?***

Plastic developing reels exposed to multiple baths of wetting agent will eventually get coated with the agent. The reels will have a rough coating on the surface. They will become difficult to load. It will seem as though the reel is "sticky" even after being rinsed thoroughly. It requires a physical brushing or scrubbing to remove the buildup, and even this is not a reliable technique. Because the surface is coated, it tends to retain some wetting agent on the reels; no matter how hard or often you wash them. This leads to a release of small amounts of the wetting agent while the reel is in the developer. The surface tension of the developer closest to the spokes of the reel is lower than in the center of the width of the film. When this happens, there is more development action at the edges of the film than the center. The density of the images on the film will be higher at the edges (except reversal films, which would exhibit the opposite density shift.)

Stainless steel reels are also affected by wetting agent. A coating of wetting agent will eventually produce uneven development, just as it does with the plastic reels.

## ***I understand all this, but how do I prevent the film from getting scratched, and still use a wetting agent?***

We have developed a technique that makes the wetting agent treatment off the plastic reels easy to do. This is not the only "correct" way, but it is a way that works very well for hundreds of our customers.

1. Prepare a solution of wetting agent or stabilizer, and place it in a plastic bowl. A re-sealable container like a "Tupperware" bowl is ideal. It should be at least six inches across (15 cm) and three inches (7 cm) high. (Do not store food in this container later!)
2. Shake any excess water from the processed film, while it is still on the reel.
3. Place the reel flat in the palm of your hand.
4. Hold the bottom spiral only by the outside edge. Twist and lift off the upper spiral, being sure to only hold it by the edge.
5. While holding on to the lower spiral edge, do a quick twist of the wrist over the bowl. The film will fall into the bowl in a neat spiral.
6. Wait for one minute, or whatever time is recommended for the solution.
7. Carefully pick up the end of the roll and raise it straight up. Squeegee the film if you wish. Hang to dry.

If you use stainless steel reels, remove the film from the processing reel and place it on a non-processing reel. This reel should be dedicated to use in wetting agent only. Again, a separate container is used for the wetting agent as above.

*A little care in following directions now means you won't have to be yet another caller to JOBO's Customer Service Department with a "mysterious film developing problem" that can only be cured by replacing all of your reels.*

## **How to Process Black and White Prints in Color Processors**

By Ctein

### **This article is an excerpt from POST EXPOSURE -- Advanced Techniques for Photographic Printers**

This excerpt of Chapter 9 from POST EXPOSURE can be found in it's entirety at <http://www.plaidworks.com/ctein/booksmpl.html>

*"More intelligent and scientifically literate by far than the standard fare, it is the best such synopsis [of information for printers] to be found in any current book directed at a lay audience." -- Mike Johnston, editor, PHOTO Techniques*

A while back, I read an article by a well-known color printer bemoaning the hassle of tearing down his color printing setup whenever he needed to do B&W printing. Like me, he printed both B&W and color. Like me, he used a compact tabletop roller-transport processor for handling his color prints. Unlike me, when he wanted to do B&W printing, he cleaned and dried his machine, moved

it off the table, and set up trays for B&W work. When he was ready to switch back, he cleaned and dried the trays, moved his processor back in, and set it up. That kind of busywork inhibited him from printing B&W when he was doing color and vice versa.

He didn't realize that any tabletop processor that can handle color prints can also process B&W RC papers. With processors designed for the RA-4 process (which takes less than a minute per process step), machine processing of B&W prints is no slower than tray processing and a lot more convenient. If one is making several identical prints, it's a lot faster.

You don't need a fancy processor with adjustable process times or more than two tanks. I use a Durst/Nutek RCP 20\* modified to run at RA-4 speed. I can regear the machine for different process speeds, but it's a major nuisance. When I want to run B&W instead of RA-4 color, I drain the color chemistry and rinse the tanks with a few flushes of clean water. Then I pour in Dektol 1:2, 2% acetic acid stop bath, and hardening rapid fixer at film strength. I'm ready to roll. Reversing the process gets me back to RA-4.

The reason this works is that I can trade off time against developer temperature with no loss of print quality. Most B&W papers do not develop fully in 45 seconds at 68 degrees F but will at 75 degrees F. I haven't found any that won't develop fully at 80 degrees F. I've run both developer-incorporated and conventional papers made by a variety of manufacturers including Kodak, Agfa, Ilford, and Oriental. I've yet to find an RC paper I can't process this way. I have to use trays for fiber-base papers because they're too flimsy and jam up in the rollers.

Newer processors often have only two tanks—one for developer and one for fixer. Don't worry; the paper's RC base and the processor's roller squeegees ensure that almost no developer carries over into the fixer. You can check the pH of your fixer periodically with pH test paper, and add a little acetic acid if you find it's rising. I'm guessing you won't ever have to.

Whenever I use a new B&W paper, I calibrate it to my machine. I make two B&W test prints in trays with fresh chemistry. The first is a sheet of paper that is half-unexposed and half-exposed to enough light to produce a maximum black. The second is a decent-looking print from any negative I have handy.

Next, I run a half-unexposed/half-black test print through my RCP 20. If the whites are as white as the tray-processed print, and the blacks are as black, I'm set. If the whites show fog, it means I'm running too hot and I cut back the temperature by several degrees. If the blacks are lighter than the tray print, it means I'm running too cold. Typically, there is a range of 10 degrees F wherein I get the full D-max but no fog. I set my RCP's temperature control for the middle of that range. To fine-tune the process, I machine-process a print of the test negative. If it isn't identical to the tray print, I tweak the temperature up or down a bit until it is.

Although I trust the roller transport to do a good job of developing, I am less confident about the fixing step. Most inexpensive machines don't have pumps in the fixing tank to circulate the chemistry. For RA-4, it's enough to have just the motion of the print through the bleach-fix, but I'm not convinced this is sufficient agitation for B&W fixing. Because the print motion is very uniform, I don't trust spot tests for residual fixer. I put the print into a tray of fixer after it leaves the processor, agitate it for 30 seconds, and then put it into the wash. Okay, so it isn't 100% automatic. It's close enough.

If I'm printing over several days, I pull the racks each evening, rinse them, and float a sheet of plastic wrap on the tanks of chemicals. This excludes the air well enough that the chemicals last 4 or 5 days before the developer loses potency. It's much easier than draining the tanks each night. Black and white developer and fixer are so cheap that I don't care whether it's a bit less

economical than draining the machine would be; my paper costs are still over 10 times greater. Now, if I could only figure out how to feed fiber paper through those rollers.

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*Along with the check or money order, include a sheet of paper with your name, address, phone number and email address, and the name you want the book made out to if it's different from the addressee.*

\* The Durst/Nutek RCP 20 is a discontinued item, the current equivalent processor is the Durst Printo. For more information on the Printo, call 800.664.0344 and request a current JOBO catalog.

## The ProTime 100 & Comparator 100

*by Sam Proud*

JOBO introduced three new electronic items for the darkroom at Photokina, the international exhibition for photographic manufacturers held in Germany last October. In JQ issue #20 (JQ9804), I wrote on the ColorLine100, the first easy to use and affordable color analyzer. In this issue we will take a look at the new ProTime 100 and Comparator 100.

**The ProTime 100** replaces the JOBO Timer 16 that was discontinued last year. It's smaller in size and price. It allows you to do other work in the darkroom during processing steps. The ProTime 100 has nine channels so you can program all your different processes. Each channel allows the user to set as many as 13 separate timed steps. The ProTime 100 has a large LCD display that counts down the time remaining in the process step. An audible alarm first warns you 15 seconds before the end of the process step. A second warning is given at ten seconds before the time expires. The ProTime 100 gives you a final warning at 5 seconds, and then beeps at 1 second intervals until the time has expired. Having the three warnings is especially helpful in planning the drain time for chemistry from tanks or drums. I usually start draining my chemistry at the five second warning. The LCD display is backlit by 6 LED's that blink in conjunction with the alarm. If you should go over your set time, the ProTime 100 will start to count up and audibly warn you that the set time has expired. I found the ProTime 100 especially valuable not only in short processes such as black and white, but in the longer processes like E-6 slide or Pyro processing.

**The Comparator 100** is the third of the new electronic 100 series products introduced by JOBO at Photokina. The Comparator 100 is a variation of the popular Comparator 2 that has been sold by JOBO for the past 10 years. Unlike its companion the Comparator 100 does not determine paper grades but just provides exposure times for black and white papers. It can also be used for determining exposures times for RA-4 and Ilfochrome materials. The Comparator 100 can be used for integrated readings or spot readings from the negative. After making an acceptable print, the Comparator 100 is calibrated to the negative, and the left and right red LED arrows are nulled out, leaving the green LED illuminated. The Comparator 100 can determine the correct illumination by constant exposure time or by constant lens aperture. The Comparator 100 and the ProTime 100 are useful tools for any darkroom, be it amateur or professional.