

KEEPING PACE

A monthly newsletter devoted to the art of darkroom photography

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A Few of Dye Transfers Mysteries

Why are there so many kinds of film available for making separation negatives or masks. If you really analyze the processes, you will find that there are many films that you could use and still make very good prints. How is one supposed to find out which film will work best for him? Well, thanks to the different manufacturers and to the many people who aren't afraid to experiment with different films and different developers. Most of them have given us the answers, thereby eliminating most of the work.

For instance, when I first began making color prints back in the late '30's, the only good material for making masks was Kodak's 33 Plate. This was a glass plate with a very soft emulsion and was color blind (ortho). The masks for contrast control were made from already existing color separation negatives. These were also on glass

plates. I used Kodak's Panchro press. Others used films that were made by DuPont or Ilford. The choices of developers were numerous. Some labs made their own Metol developer from scratch using secret formulas. Pyro was a heavily used developing agent. One could easily spot a darkroom worker by the stains on his finger nails. Considering how difficult it was to obtain a densitometer, it is amazing that so many fantastic color prints were made in the early days. The only process around then, of any professional quality, was Carbro. This meant that the man whose job it was to make the color print was usually frustrated because the photographer or his assistant didn't process the negatives properly. It was a common practice to be hired out as a color expert and go to the photographers studio, bringing our own color "one

shot camera", photographic glass plates, check his lighting, and make a few exposure and processing tests before the actual job was to be photographed. The plates were usually processed and checked at the photographers studio before leaving. We would do this for \$25 a day. We would check the grey scales that were placed in the scene for the first exposure only, using one of a few available densitometers. One was made by Kodak and was pretty accurate. Marshall also made one. One system used a piece of film that contained a series of calibrated grey patches. You could place the calibrated grey scale against the grey scale and tried to find a close match. What it really boiled down to, was that the color technician had to have the eyes of an eagle and the soul of an artist. Some of the prints that I have seen that were made in the late

1930's are still amongst the finest things ever made. Nickolas Muray, the famous illustrator of the early 30's and 40's was a perfect example of one who had color sense and all of the necessary skills to make incredible prints. His assistant, Charlie Thill, was one of the finest photographers and Carbro printers I have ever had the pleasure of knowing. These fabulous Carbro prints were made without any electronic aids or easel meters. Just the eye. But, what does this have to do with today's crop of talented photographers and darkroom workers? Most darkroom technicians that are working with the Dye Transfer process today, usually find out what kind of film and developers to use by reading manuals written by Kodak or some other person who has made a few prints and gives you the information. Unfortunately, most people who write books or articles about the Dye Transfer process, have never made more than a few prints, and after getting good results, feel that they understand the process and that they are able to write or speak about it. This isn't always true. The average darkroom worker has his hands full every day, trying to improve a specific technique. I will try to show you some of the thinking and "tricks of the trade" that

I have either, discovered or worked out, in the past 45 years.

The criteria in choosing the proper film for making separation negatives is twofold.

First is the question of color sensitivity. Films like Super XX have the ability to capture all of the colors, through separation filters, with the exposures and the sensitivity of the colors being fairly equal. Kodak also makes Separation 1 and 2. films. These films are made to be machined processed. Processing these films by hand is quite difficult. The necessary agitation is more easily carried out by a roller processor than by hand. Unevenness is the result of improper hand development.

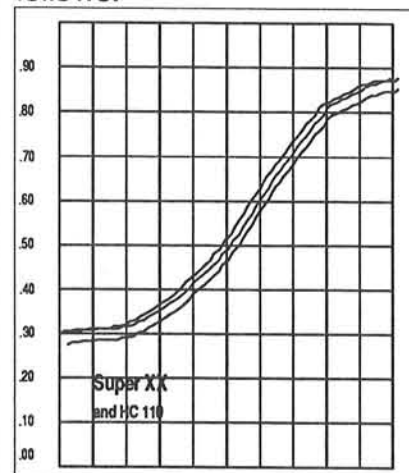
There are films made by other manufacturers just for the purpose of making separation negatives. These films can be used for any other purpose, as well. The developers are many. The trick is to find one that will give you a clean and accurately stepped grey scale, and not be too far apart in color filter exposure factors.

The second criteria is, how straight and accurate is the curve shape? This is probably the most important thing to look for.

An example:

I have plotted curves for all of my years in the color business. I haven't stopped

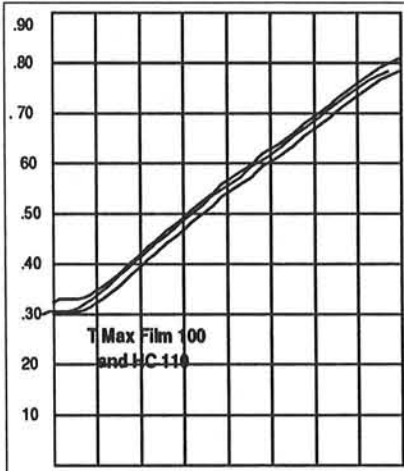
yet. I am presently using a TD 102 Macbeth densitometer. The curve shapes for Super XX, using HC110 developer, is as follows.



Notice how the top end of the curve flattens out. Actually, the top 4 or 5 steps of the grey scale will have lost some of its contrast. This is further complicated by the fact that the matrix film you plan to use has even a worse curve shape at the toe, which is where the highlight eventually ends up since we are working from a negative to a positive. If we were to develop the blue filter negative too long, the top would flatten out much more. We must not develop the blue filter negative beyond a specific gamma. This will determine just what gamma the entire set of negatives is developed to. This was a hidden fact for years. Most of the information about processing separation negatives gave

development times that approximated between gamma .70 and gamma .80. I doubt that they based the development times on the fact that the blue filter was the culprit.

The curve shapes for T Max film 100, and HC110 are as follows:

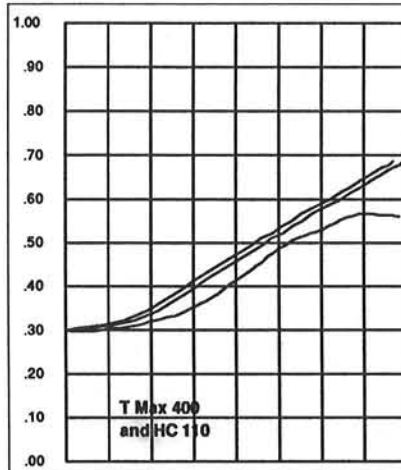


Notice how straight the curve shapes are here. This film should make excellent negatives. The only problem is one of exposure. The red and green exposures are fairly short, but the blue exposure is extremely long. As long as you are not in a hurry, it should work without any problem. Tom Rankin of Frog Prince Labs in San Francisco has been making his separation negatives using T Max film with HC 110 developer for quite some time and is experiencing no problem.

The curve shapes for T Max film 200, and HC 110 are as follows.

Notice how the top end of the blue negative exposure flattens out at the top. The

reason for this is called "Chemical fog" Actually, it is not "fog " at all. The film is



at it's limits of developing and refuses to go any further. The top area stops developing while the bottom part keeps on getting stronger. This is one of the reasons that my particular system for making separation negatives is a little different than most.

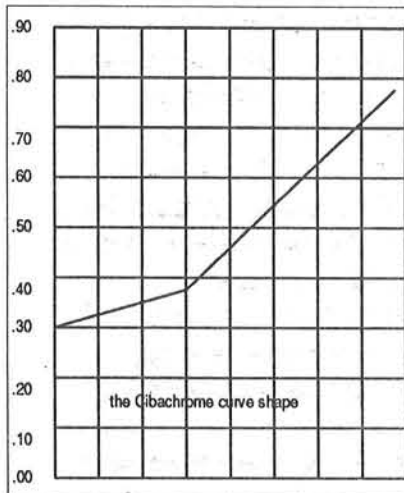
What I do is to find which combination of film and developer will allow me to process the sheet exposed through the blue filter to a gamma of .70 or .75. Once I find this combination, I then build the rest of the system around it.

If any of you have read Kodak's E 80 and were confused after reading it, don't feel bad. You were not alone. Most of the labs in the world used this pamphlet as a bible. Parts of it are great. Most of it is inaccurate. Most labs in the world will make a 25% mask from their transparency and then

place this mask back to the transparency when exposing the separation negative. The question that I ask is, **who said 25%?** Most of the things that I have read never questioned the reason for masking. Especially 25%. Why not 15% or 40%? Who said that 25% is the correct percentage? The simple fact that I started so long ago in this color printing field has led me to question the authority of the writers who makes such statements. I know that people will question me about some of my views, but I am ready to answer them and make my case. You should always confront any "expert" who gives you absolute numbers to use in your process. There is no way that any one can do that. Even guides are a waste of time if you are not shown how to find your own levels of accuracy.

My theory is one that is based on experience. Many years ago I began to experiment with the new Cibachrome material. The material was extremely contrasty, but the color saturation was excellent. The question for me was, how to reduce the contrast range to a point so that the final print would have all of the detail in it that the eye sees but almost never comes up in a print. I discovered two things when I plotted curves on

the material. I found that the straight line portion of the print material was almost a straight line. However, the bottom had to be left open because the material is flat in the shadows and required no masking in the bottom 1/3rd of the mask.



If you examine the curve shape of Cibachrome paper you will notice that the top end is almost straight. This means that you will maximize the highlight detail and hold all of those little tiny brilliant reflections with resorting to making highlight masks. The curve shape opened up some thoughts in my mind. Why did most of the material on Dye Transfer say that the mask should be 25%? I found that once I knew the limits of the material that was dependent on the kind of enlarger that I was using, the rest was relatively simple. I had to make the mask for the transparency so that when applied to the transparency the result was whatever range

the negatives required. I used this technique and have made prints that were accepted for many years and can explain how the process works.

The first thing that I did was to find out just what kind of density range my enlarger was capable of handling when it came to making matrix films. Not being surprised at all, I knew that different kinds of enlargers would produce different results. Soft and flat enlargers such as diffused systems would require more contrast in a given negative than a contrasty condenser enlarger, which would require less contrast. Using a 21 step grey scale gave me an exact description of what the high and low limits of the material would produce. Once I found out what the numbers were, the rest would be an exercise in plotting and making charts. The trick was to find out the ranges available for all of the materials to be used. This is a little time consuming, but definitely worth the trouble.

My technique is as follows:

1. Know the enlarger limits.
2. Have all of the charts ready for use.
3. Read the transparency in question and determine the mask contrast (gamma) needed to properly reduce the original, before making

negatives.

4. Make and verify the contrast of the mask.
5. Make the separations to a specific gamma.
6. Plot the curves to verify the gamma.

This system of masking works for most originals, but as usual, there are exceptions to the rule. Very light originals or very dark originals do not easily lend themselves to this kind of reduction. This is where the eye becomes the most important factor.

Anyhow, as you can see, I am a great believer in masking. If the shoe doesn't fit, there is no way that you can be comfortable. The same applies to making prints from transparencies. Make it fit. If it doesn't, we have the opportunity not only to make it fit, but to improve upon the original, no matter how sensational the original may appear. Writing about the Dye Transfer process would take more space than this newsletter will allow. I have written the professional portion of the new book being printed by Kodak about the Dye Transfer process. It should be out very soon now.

Consider this. If you are working with a material whose contrast cannot be changed by processing differences, then how would you make a quality print that had detail in the

highlights as well as the shadows? The only way is through masking. It sounds like a lot of work. It could be for some people, but for others, it's worth the trouble so that a fine quality print is the end result.

First of all, it requires knowledge. You must know the limits of your equipment. And you must have a system or formula that will allow you to make masks easily and accurately. You must have simple and extremely reliable registration equipment. There are only a few people in the world who know about these pieces of equipment. The best is Condit Mfg. in Sandy Hook, CT.

Secondly, you must be aware of just what your material is capable of producing. If you know what kind of density range your enlarger requires for Kodak's matrix film, then you should know what kind of negative your system requires. The same procedure and basic thinking applies to Cibachrome, Type R or any Reversal film process. Each and every kind of material has its own contrast range, depending on **your** enlarger.

Another conclusion that I have come to realize is that the color saturation in your print depends a lot on just how dense your contrast mask is. In essence, the contrast of the mask

controls the overall contrast of the print, but the density of the mask controls the saturation of the colors in the print. For this reason, whenever I have to make a mask, the **exposure is tied directly to the development times**. As the gamma goes up, the exposure comes down. This keeps the density of the mask at its optimum level. With this system, I can make masks to as low as 5% or as high as 45% and keep the saturation level where it belongs.

Something you should know about Ciba

Making quality color prints on Cibachrome paper is a challenge to most darkroom workers. The main problem is contrast. As I have said earlier, every enlarger has its own level of contrast. If you are able, make a print from a transparency on a soft diffused dichroic enlarger and make another on a crisp condenser enlarger. The difference will be easily seen. If you were making prints from black and white negatives and contrast was a problem, all you need to do is select the correct contrast filter to be used with your paper and the problem is solved. But it's not quite that simple with Cibachrome. You can't (or shouldn't) change the processing times in order to

change the overall contrast. **First of all**, you would get a color crossover that would ruin the color contrast balance. And **secondly**, you couldn't control the contrast as much as masking can. Recently, some efforts have been made to use a self masking system for turning out small Cibachrome prints for the mass market. All the masks are made to the same level and therefore cannot be considered as accurate as an individual masking system. But, I must admit, the prints do look much better than they would have if they were not masked at all. There has also been recently introduced, a Corning glass that darkens with exposure and could be placed in contact with a transparency and a mask could be made that could work. But in order to actually produce a mask, made through the proper color filters and made to an exact percentage, there must be a little work and understanding involved. But just what kind of mask is to be made to reduce the overall contrast of a Cibachrome print? Is it made on Pan Masking film? And if it is, what kind of light source do we have to use? Is it colored light through filters or white light? These question, and many more must be answered before understanding just how to

make these masks.

Equipment. This is a major commitment. You must have quality equipment or you will be spending your days trying to register masks, instead of making prints. The equipment includes some means of exposing with a light source through a printing frame, or printing platen or some sort of vacuum system. You must have a film punch, and the pin glass that goes with it. If you read my last issue about processing, you will know how to process properly and get repeatable results. Most importantly is some kind of carrier insert or special carrier that will allow you to place this combined mask and transparency in your enlarger. Whether or not your enlarger is dichroic not, or is a condenser type or not, and uses individual filters, is really not important. The main thing is to know the limits of your system.

Cibachrome is a relatively slow material. I have used **pulsed xenon** light sources (with an 85B in the light path) in order to speed up my exposures, because there is a reciprocity problem with any slow multilayered material such as Cibachrome, but if you don't mind long exposures, any bright enlarger should work. However, expect changes in color balance

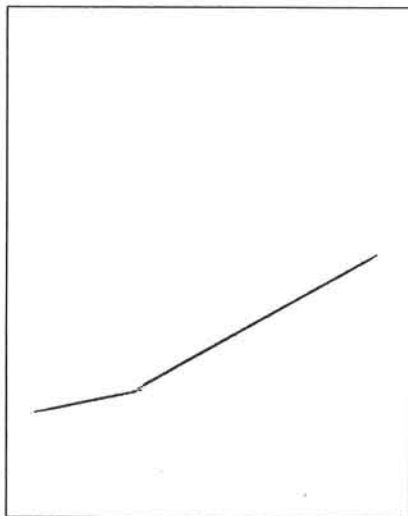
and speed each time you vary the exposures when they are long (over 50 seconds) to begin with. In order to make a determination of your enlargers capabilities, place a 21 step grey scale in your enlarger and size it up to about 8x10. Make sure that the entire grey scale is masked with opaque material. All you want to see on the easel is the grey scale. Make a series of exposures using the recommended filter pack, and process this sheet normally. One of these exposures should show enough of the grey scale so that the top and bottom are about equal distant apart. Here is where your eyes play a big part. Examine this particular exposure and find where the detail at the top end stops and mark it. Do the same at the bottom end. You now have found the limits of your enlargers ability to produce a black and white with detail. You should have a densitometer in order to go any further. Remove the original grey scale from the enlarger and find the exact steps that you have marked on the print. At this time read both the high and low reading that you have marked off. Subtract the low from the high and the result will be the **Density Range**. This is the density range that is required to make a print loaded with

detail at both ends, and that will have the correct look for contrast. There are exceptions to this rule, but for the majority of work, this will more than suffice.

The next point to consider is how dense to make the mask. Take a look at the diagram showing an average curve shape for Cibachrome paper. The bottom end lays much flatter than the rest of the curve shape. Here is the necessary masking trick to make this masking process work properly. You must not expose the mask too long as to have the bottom 1/3rd of the image exposed. You must have a blank image on the first 1/3rd of the photo. If your mask goes down to the bottom of the image, then the shadows will be too flat for the rest of the picture. The aim here is to lower the contrast of the rest of the picture without disturbing the bottom 1/3rd. This is critical. If ignored, then the top half of the photo may look great but the shadows will suffer.

The next item to consider is whether or not to use separation filters when making the masks. If you use white light (3200 K) then the chances are that the film, which is already too sensitive to the red layer will act somewhat as if a red filter were used. And if only a red filter is used, then all reds in the photo will be intensified or

darkened, while the greens and blues will have been lightened. In other words, any filter you use will intensify the color and lighten the opposites. A combination of filters is a good way to approach this color problem. Split the exposures on one sheet of film and get a compromise for color correction. Even an 85B filter will work wonders with warm colors while lightening up any of the cold colors.



The average slope of Cibachrome paper

Camera Back Masking?

Camera Back Masking. How does it compare to making masks and friskets on the easel? This is a method that is used more than any other system in the field of photo composition. The main ingredient, besides having a good camera, is knowledge. If you own a large graphic arts camera,

with a vacuum back, you have most of the tools that you will need. However, if you own an 8x10 camera and have some means of locking it in place so that it will not move, once locked, then you can still make it work for you.

The object is to have a rigid platform from which to work. I used a 30x40 Brown Commodore with a 20x24 vacuum back, to which I added a set of perfectly centered, 8x10 diagonal retractable pins, and had the punch that fit it. I also installed a set of pins to fit the Kodak Matrix punch. These pins were placed at the top of the vacuum board. In essence, I had two pin systems installed on the same vacuum back. This enabled me to place a large sheet of film on the Kodak pins, usually emulsion towards the back. This then allowed me to later place an 8x10 sheet on the smaller pins, actuate the vacuum, then retract the smaller pins, place the larger sheet on the Kodak pins, which was either a contrast mask or a frisket of some kind, and have a perfectly fitting mask that was easily placed in position in the dark. In other words, I had a working platform with which to place all of my camera back masks. I could make positives and reverses and use them with the assurance that they would always fit properly.

This was only the beginning. The copy board was also just as important. This copy board had to be rigid and not easily moved once it was placed into position. The copy board also had a light box installed in it so that transparencies could be copied. This light box has since been replaced by the dichroic light box. Being able to adjust the color balance was a dream in the old days. We had to place large color correction filters in the light box with the transparency.

Pins were also installed in the back glass so that masks could be placed over any transparency while making copies. This also included making friskets (hold back and burn in masks). This was a system that was widely used by all the labs and most of the lithographers in the world. But, the technical revolution is here and now we have a whole new breed of equipment and technicians, the likes of which, we have never seen before.

An example. The Lysle Camera is a computer actuated system that will place transparencies on a dichroic light box, place it in front of a camera lens, on pins, adjust the color balance, position, size and exposure. Hold out and burn in masks are also made and placed on small pin systems at this point. It

will handle 24 transparencies at a time. Any size. The camera back also moves around so that positioning is a simple chore. The computer is able to be set so that it will place items to fit a layout and after all is ready, a button is pushed and all of the items are moved into position, the camera back moves, the lights change color and intensity and a sheet of duplicating film as large as 16x20 is exposed and ready for processing. If, for some reason, all did not turn out as well as expected, the camera can be adjusted to correct for the few bad calculations and then repeat all of the exposures and moves, including the corrections, in a matter of minutes. This camera costs around \$150,000. Considering what it does, it is a bargain. But now we come to the heavyweight division. There are available right now, about 5 different computerized image makers that will take your transparencies and place them into position, color correct them, silhouette them, elongate them and do just about anything you could imagine. They seem to be getting better each year. The real drawback is cost. They are very expensive machines and require lots of work to be able to pay for themselves. They are around one and one half million dollars

each. I had to write that amount out, because it would be difficult to imagine using only numbers. Try writing that amount out, and see what kind of an impression it makes on you. Could your budget handle it? If your answer is no, then consider using some of the techniques that I have mentioned here. Believe me, there is nothing wrong with working with your hands and eyes and emotional feelings.

Commercialism?

Just a word about commercialism. I don't mean to proclaim any piece of equipment to enhance their sales. I am not into that kind of game. If I see a certain instrument and honestly believe that it can improve ones work, then I will mention it. No one pays me for writing about any equipment. Some people feel that I am a salesman for the Condit Co. I am not. Although I know and admire Warren Condit and have known him for almost 40 years, I also know that his equipment is the best. The Zone V1 developing timer that I have written about is truly amazing. They have their own advertising program, and don't need me to hawk their wares. I will always pay my respects to talent and brains. I will, of course, sell Bob Pace. This is a small

and normal function of this newsletter. My main goal is to inform you about things you may not have had the opportunity, as yet, to find out.

Now, for a small commercial.

Kodak is just about ready to unveil their new book about the Dye Transfer process. Yours truly has a lengthy portion of it devoted to the professional view in producing Dye Transfer color prints. It should be quite a book. There are articles in it by Ctein, Dennis Brokaw, Charles Swedlund and me. Frank McLaughlin, formerly the head of the Dye Transfer division of the Kodak Co. is the editor and brains behind the entire project. His writing is accurate and very informative. Look for it soon.

And, I just happen to have a few books of my own for sale. "The Art of Photo Composition". If you would like a copy, the cost is \$50 plus \$3 for P&H. And if you like this newsletter and have not yet subscribed to it, the cost is \$60. per year. (12 issues). Back issue copies are \$5. each. Thanks again.

Bob Pace
 13900 Trinidad Dr.
 Victorville, CA 92392
 619-241-0905