KEEPING PACE

A Monthly Newsletter devoted to the art of Darkroom Photography

Volume # 24 June, 1989

An easy introduction to the Dye Transfer process

Making a dye transfer print seems to be an almost impossible task for the inexperienced darkroom worker. In some cases, this is true. However a simplified approach to making a dye transfer color print directly from a color negative is possible.

The whole idea depends on your ability to repeat exposures and processing times and temperatures accurately.

If you can make a C print with assured repeatability, then you can make a Dye Transfer print.

Let's first examine the specific equipment and supplies that are necessary:

1.

A sink with enough room in it so that a set of matrices can be developed without feeling crowded. If you plan to make 16x20 prints, then measure the dimensions of the trays and make sure that you have room to process with confidence, using three trays. Remember, this portion of the process in done in **total darkness.**

The same sink can also house the other elements needed to produce a print. For instance, where will you place the three trays containing the Kodak Dye Transfer dyes? A space for the tray containing the paper conditioner must also be considered. A shelf above the sink area can be used for such purposes. The shelf can be rigged up to either slide from side to side, or rocked back and forth.

If necessary, a large table will suffice, but the realization that the dye trays must be tilted every so often, in order to keep the matrices covered and from floating out of the dyes, and from receiving improper dyeing.

2.

You will need a transfer board, and a flat space to place it on. This transfer board can easily be made by anyone. Simply purchase a sheet of plate glass about 3/8 of an inch in thickness from any glass supplier. The necessary pins with which you register the matrix films can be purchased from Condit Mfg. Philo Curtis Rd. Sandy Hook Conn. 66482. These are stainless steel strips with the necessary pins welded in place.

3.

A print roller. Kodak sells a 17 inch roller, so does Condit Mfg.,. and I would imagine that any large quality art supply store that sells lithographic equipment would also have rollers and squeegees.

4.

A large enough supply of 1% acetic acid. This can be accomplished by purchasing

a large 20 gallon plastic garbage can.
Mix 800 cc of glacial acetic acid in 20 gallons of water and your supply will last through the day.

5.

The Kodak dyes and the Dye Transfer paper are available from any Kodak dealership store. The chemicals needed to process the matrices are as follows.
Tanning A developer
Tanning B developer
C 41 fixer.

6.

All of the little graduates and squeeze bottles used to add small amounts of chemicals to the first tray can be purchased from any lab supply store, such as Tri-Ess Lab. supply, in Burbank CA. (213-245-7685)

7.

The *very important items.*
The separation filters.
The numbers are Red 29, Green 99 and Blue 98. (or 47b) These are available from Kodak in various sizes. If you must place the filters under the lens, make sure that they are clean, and of course, made of gelatin, not acetate. If possible, place them above the negative carrier .

8.

Kodak's Pan Matrix film, #4149, only comes in two sizes, 10 x 12 and 16 1/2 x 21 1/4 inches.
This Pan Matrix film comes pre-punched so that no matrix punch is required. Neither is a film punch for the color negative, or a registration carrier or any other item regarding register. Other sizes of Pan Matrix film are available with special orders.

9.

Dye Transfer paper is available in different sizes.
You will need **Kodak's Paper Conditioner.** This is the chemical that allows the dyes to properly transfer to the paper emulsion.

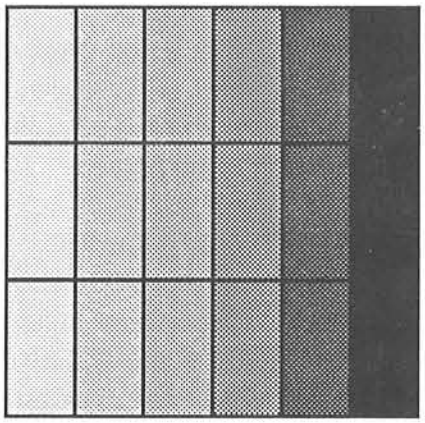
10. Finally, the most important item of all. A good easel meter.
Without a reliable easel meter one would have to resort to mathematical equations in order to find the right levels of light whenever a change in size was necessary.
I have been using a **Jobo Star 2000** easel anylizer with great success. **Speedmaster also makes a great unit called the S M 1400.** However any quality meter will work.

11. The chemicals needed to process the matrix films.
Tanning Developer, A and B Available through Kodak.
C 41 fixer.
Acetic Acid (Glacial)

Here is the procedure.
You must have a "Shirley" color negative, or any color negative of a grey card. This is most important. This will be the main negative used to calibrate the differences between the Ektacolor paper and the matrix film.
Using your enlarger, make a small "perfect" print of the grey card on Kodak's Ektacolor paper. This may take more than one attempt, but must be done.
When you have achieved this task, record all of the factors that produced the print.
Record the exposure, the filter pack, and most importantly, **the light level on the easel.**

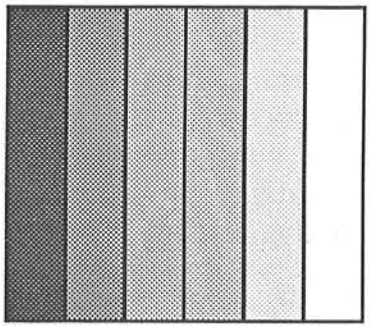
Then the next step is to make a test of the matrix film and find all of the the necessary exposures needed to produce the **same grey** with dyes.
Here is one approach to finding this set of exposures.
Use four sheets of matrix film, (smaller pieces can be cut from the larger sheet).
Use the enlarger at the same height and F stop
Do not remove the filter pack (or dichroic settings) from the enlarger.
Add the red filter to the enlarger filter drawer, or under the lens. Then, in total darkness, make a series of strip exposures across the film, from left to right, with exposures of 5 seconds apart.
Process this one sheet of Pan Matrix film in 100 cc of A and 200 cc of B, tanning developer. Develop for 2:30 min. at 68 degrees,

stop bath (1% acid rinse) for 45 seconds, fix until clear, hot water wash and dry.
Dye in Cyan dye for 5 minutes, then transfer to a sheet of prepared Dye Transfer paper for 5 more minutes. Remove the matrix and examine the new sheet with the cyan image and the original grey card C print through a red #29 filter. Find which of the strip exposures matches the C print for density.



When that density is found, make a new **full exposure on a separate sheet of Pan matrix film.** Identify it as the Cyan Mat.
Then make a strip of exposures fromleft to right on a second sheet of matrix film through the green filter.
Then, make a series of strip exposures on the third sheet of film, from top to bottom through the blue filter.

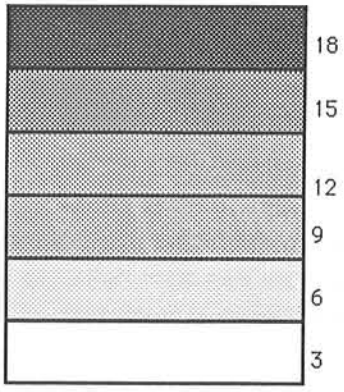
Process these three matrix films in the appropraite sized trays.



Green filter exposures

If the film size is 8 x 10, then use 250cc of A and 500 cc of B solutions.at 68 degrees, for 2 1/2 minutes, then in a 1% acetic acid stop bath for 45 seconds then into the non hardening fixer (C 41) until clear. (about 45 seconds).

The correct technique is to mix the two components (A and B) for no more than ten seconds then place the films into the developer at 15 second intervals. This will allow you to interleave the films with relative ease.
Then remove them from their respective trays with the same 15 second intervals.
These three films are then washed off, one at a time in 120 degree hot water until no evidence of loose dye or molten gelatin is visible.
Then dye all three matrix films.
Add the matrix films to their correct dyes. The red negative exposure is placed into the cyan dye, the green negative exposure is placed



Bluefilter exposures

into the magenta dye , and the blue filter exposure is placed into the yellow dye. Allow them to soak for ten minutes. Moving the trays will assure that the film has been evenly dyed up.
Then place the cyan matrix into the first of two trays of 1% acid rinse, for 1 minute with continuous agitation, or rocking, then place it into the second tray. This is just a holding tray
Place the preciously conditioned sheet of Dye Transfer paper, (about 20 minutes soaking in paper conditioner) on the transfer board, about 1/4 inch from the register pins. Roll the paper down as tightly as possible. Squeegee of any excess conditioner, and then lightly sponge off the paper with a 1% acid rinse.
Transfer the film to the paper for 5 minutes.
When 4 minutes have elapsed, begin the same procedure for the magenta matrix, then remove the cyan and replace it with the magenta. Make sure to

sponge the paper again, gently. The pin system should allow you to place the matrix properly.
Do the same timing and procedure for the yellow matrix. Transfer the yellow for 4 minutes and remove the last matrix from the paper.
You should now have a sheet of dyed strip images of various colors and densities. Somewhere in this maze you will find an area that approaches a grey. Determine what exposures produced that grey. Then proceed to refine it even further and proceed to make a complete set of exposures of the **entire grey card.** This may take more than one attempt. However, when you do finally get a set of exposures that match the original C print of the same gray card, you are ready to make some calibration's.

Record the three exposures needed to produce the grey card Dye Transfer print.
The light level has already been recorded. So has the filter pack needed to produce a perfect grey card in a C print. This is all the information that you need to know.

Here is how to make a Dye Transfer print from the color negative.

1. Make a good C print of any subject matter. Any size will do. Make it 5 x 7, or 8 x 10 in. size. Make sure that you are pleased with the density and color balance. Read the light level, and record it.
Then re-size the image to the size you wish for the Dye Transfer print. **Remember, do not remove the filter pack from the enlarger.** Remove the color negative from the carrier and **establish the same light level.**

If the exposures that were required to make the original grey card Dye Transfer print were 15 seconds for the red filter, 20 seconds for the green filter, and 40 seconds for the blue filter, give the new matrix films the same, exact exposures . You should be able to produce a set of matrices that very closely resembles the small C print that was used for the test.
The fact that you are constantly changing color packs when making C prints will be all the corrections needed when producing Dye Transfer prints.
If and when the Ektacolor paper emulsion is changed to a different number, or if the matrix film emulsion is changed to a different number, than a new set of tests must be made to re-establish the new calculations in order to make more prints.
The controls needed to produce quality Dye Transfer prints when running the matrices through their necessary steps, are quite simple.
The first of the two 1% acetic acid trays is used as the control tray. **Chemicals are added to this tray** to lighten the overall density of that particular color or clean the highlight areas of that color. These chemicals include Sodium Acetate (a 5% solution) and pure Calgon (a 1/4 tspn. to a liter of water) Adding small amounts of either or both of these chemicals to this first tray and then timed accurately, will affect the overall density of that particular color.

Other chemicals can be added to the dyes in order to affect their contrast levels. In this case, 28% acetic acid is added to the dye in order to increase its contrast level, and a 10% solution of Triethelalomine added to the dyes will reduce its contrast level. Obviously, these chemicals are used in small and limited amounts.
The final print will exhibit much more color saturation and sparkle than can ever be obtained in a C print because of the fact that the matrix film can capture more of the image from the negative than can the C paper, and also because the **control is in your hands.** You can not only make the print lighter or darker, warmer or colder but also more or less contrasty in all the layers of

color in any direction you wish. This introduction into the field of color printing using Dye Transfer as the medium will allow you to become acquainted with the Dye Transfer process.

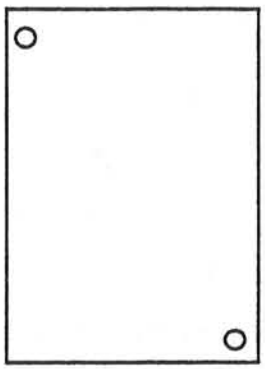
This is a clarification of earler articles about masking.

One of my readers asked me to clarify two separate methods of making masks that I wrote about in earlier editions of "Keeping Pace" The questions referred to my placing the films in their proper order in order to make a principal mask, and eventually separation negatives. The answer actually can refer to any process that requires masking in prder to improve its quality of reproduction. Here is part of the letter that I sent to my reader.

The illustrations that you sent me are from 2 separate systems. They have been misunderstood.
Here is the system that I use for making separations from a large original, by contact.

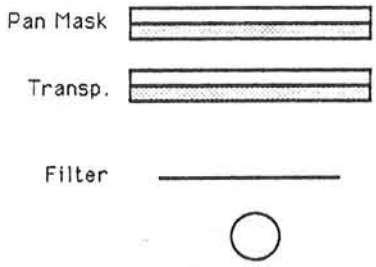
1. The first step is to use a diagonal pin glass with the pins set in the following positions.
With the light source coming from the bottom

use this pin orientation to make the masks



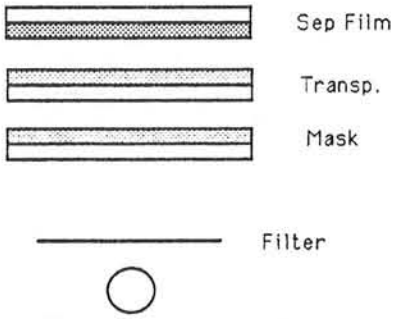
Use this pin orientation to make the negatives

The reason for making the masks this way is so that the orientation of the image will not be disturbed .
When making the masks, with the light source from below, place the transparency on the reverse pin glass, emulsion down. Then place the unexposed masking material over the transparency, also emulsion down.



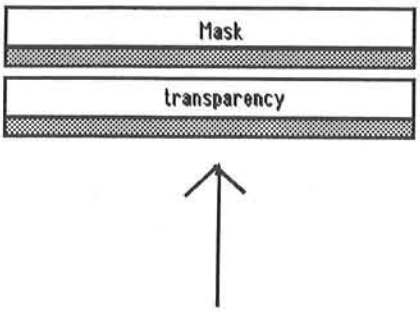
This side indicates the position of the various films when making a principal mask using "reverse" pins.

After the masks are made, switch to the second (normal) pin glass. Place the mask on the glass first, emulsion up, followed by the transparency, also emulsion up. Then followed by the separation film. emulsion down.
Only in this way will the relationship of the image be the same when making separations.
If only one pin glass is used, and the masks are made with the transparency emulsion up and the mask either emulasion up or down, the mask and transparency will have to be moved to a new stacking order so that the separation film will be emulsion to emulsion with the trasnparency.
mask will not be in the



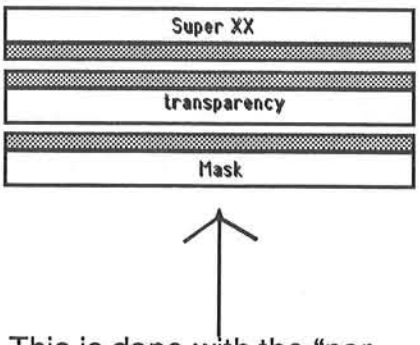
This side indicates the position of the various films when making separation negatives. using the "normal" pins.

However, the image on the proper position as it was when originally made. This will cause edge effects.



This is the orientation for making the masks with the reverse pin glass. If you turn the page upside down, you will see that the image stays in its original position. This is what happens when you switch glasses.

Making the final separation negatives this way will insure you of accurate edges.



This is done with the "normal" pin glass.

I was again asked about split masking. Split masking is not complicated.
Usually a 70% red to 30 % green is all the split you will need for the first mask used for the red negative.
Normally, the full 100% red mask is all you will need for the green negative and the 100% green mask is all you will need for the blue negative.
However, the second mask could be split with the red, 80% and the blue 20%. The third mask could be split 80% green and 20% blue. There could be many variations.
Any further splitting must be done with care. **Remember, the color of the mask will make that color darker in the print. The opposite color will be lighter in the print.**

A second question was asked about the proper orientation of the films when making the "isolation masks".
This system is actually **a color correction system.**
The next explanation is for the illustrations that you attribute to page 4-7 from Vol. 7. This actually refers to a color correction system that I have "invented " about 20 years ago.
This has nothing to do with the making of separation negatives.
It refers to making a set of positives from a set of separation negatives, then combining them in such a way as to "isloate" an area of color.
This **area** is then exposed onto a sheet of Pan Masking material. (actually, any continous tone film will work)
These new sheets of exposed "areas" are then **added** to the proper separation negatives in order to affect "color correction".

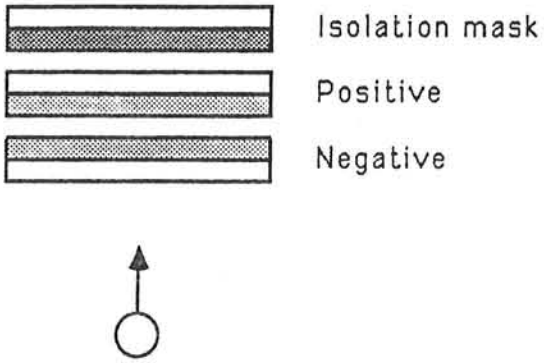
The illustrations on the following page will show you how the process works and the proper way to line up the various sheets so that the gathering of the "areas" can be accomplished.

If necessary, refer back to the original explanation of this color correcting idea that I explained in Volume #7 .
I think that this detailed drawings and text explained the method that I have used for many years.
The reason that this method of color correction was necessary (in my opinion) was because of the fact that the dyes used to produce the gelatin separation filters are not "perfect".
The filters are fine, as far as they go, but the simple fact is, is that the colors are not sharp cutting enough. Too much of the opposing colors get passed through the separation filter and cause muddying up of the color print.
Try shooting a set of separations, in camera, using a Kodak grey scale with color patches, through a set of separation filters and see

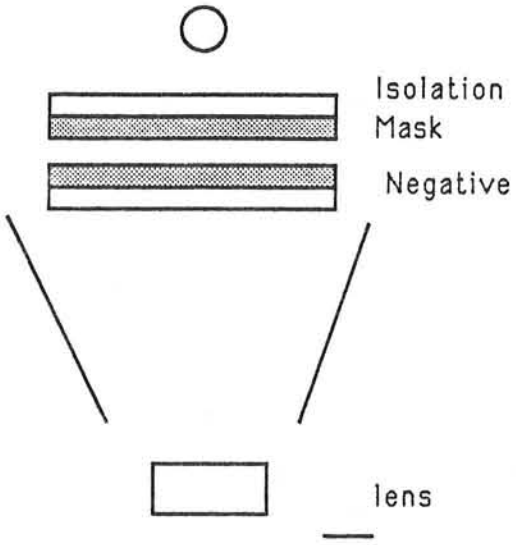
what happens to the color patches. They will be overlapped to such a point that they will not print a pure red, green, blue, cyan, magenta, or yellow.

The need for color correction during the Carbro days was not as crucial as it is today, because there was no color transparency to judge the print against.

We have the transparency to guide us and to compare to therefore we are always trying to get a richer and purer color than otherwise.



This is the orientation of the films when making the isolation area mask



This is how it is used

Why do we need color correction ?

The most amazing ing thing to think about is the accuracy of the old Technicolor process. This process had its beginnings back in the early part of the century.
The "one shot camera" and the rest of the process, was invented by Dr. Kalmus. His early attempts in color photography were made as early as 1914.
In 1921 when the original "Phantom of the Opera" was made, a short 5 minute sequence was filmed with this new "one shot" motion picture camera. It pictured the star, Lon Chaney, dressed in a flowing red robe and wearing a death mask, flowing down the large staircase in the Paris Opera House. The effect was startling.
When I saw the film again recently, it received strong applause when that particular sequence was shown. The audience sensed that they were watching an important moment in the history of color photography.
In the ensuing years, the process and the dyes were perfected to such a point that clarity of the process would become legend.
The images were photographed through a single lens, and then the image was split through three semiannual pellicles, which diverted the image through three separation filters and onto the three reels of panchromatic film.
There was little need for masking because of contrast , because the negatives were shot and processed to

the correct gamma. However, what about masking for color? Did you ever see a "bad" Technicolor movie? Hardly ever.
The masterpiece "Gone with the wind", which is 50 years old, still looks as if it were shot yesterday. Why?
The dyes that were used by Dr. Kalmus and his company were much sharper cutting than today's current set of dyes, which I have been using since 1946. The process is still kept as a secret. Even the chemistry needed for the processing of the matrices was, and still is a secret.
Remember, the negative film had to be processed to a specific gamma. Then the matrices had to be exposed to the exact balance, and then processed in some sort of tanning developer, fixed, and hot watered, dried and then dyed and transferred.
It is really mind boggling. It is no wonder that the Kodak negative to positive color process took over and became the method used today.
But the amazing thing is that the Technicolor colors were great and are still with us. Some of the early films have been projected thousands of times and still remain crisp and sharp.
The reason for color correction would not be such a necessity if we knew what dyes were used in those early films.

Some local news

Alan Williams, of Los Angeles, one of the country's foremost retouchers, has added electronic retouching and digitized image making to his already well known abilities.
The unit is quite costly, but will enable him to stay in the retouching field with both ends of the retouching medium covered.
His airbrush work and his abilities with bleach and dyes has made hime one of the most qualified retouchers in the business. The new scanner should even improve his lot. Good Luck

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One of the best Dye Transfer labs in the country, Bob De Santis and associates,of Los Angeles, California, has been involved in making high quality black and white prints for the past few years and is turning out some spectacular prints for the advertising trades.
In addition to making Dye Transfer prints and black and white prints, he will soon be adding a Cibachrome department to his business.
Ted Stadle, one of the most recognized Ciibachrome printers in America is planning to join the DeSantis organization.

News about my Video and Book.

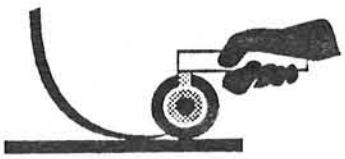
After a slight delay, we are in the final stages.
The book is virtually finished, except for layout and pictures which is being acomplished as you read this.
The Video looks great and is waiting for two more days of shooting and editing and hopefully, sometime in the summer, it will be ready for distribution. I have received many requests for news about its availability. Have patience just a bit longer.

For those of you whose subscription runs out in june, this will be your last issue.

If you wish to re-subscribe, please send a check or money order for $60 to :
Bob Pace
13900 Trinidad Dr.
Victorville, CA 92392

My book, "The Art of Photo Composition", is still available for $50 plus $3. for shipping

Next month I will be doing some research with Edgar Praus, of Rochester, NY. on the new Dye Chrome Chemistry, based in Flodida. This chemistry is about reducing the overall contrast with Cibachrome paper.



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