KEEPING PACE

A monthly newsletter devoted to the art of darkroom photography

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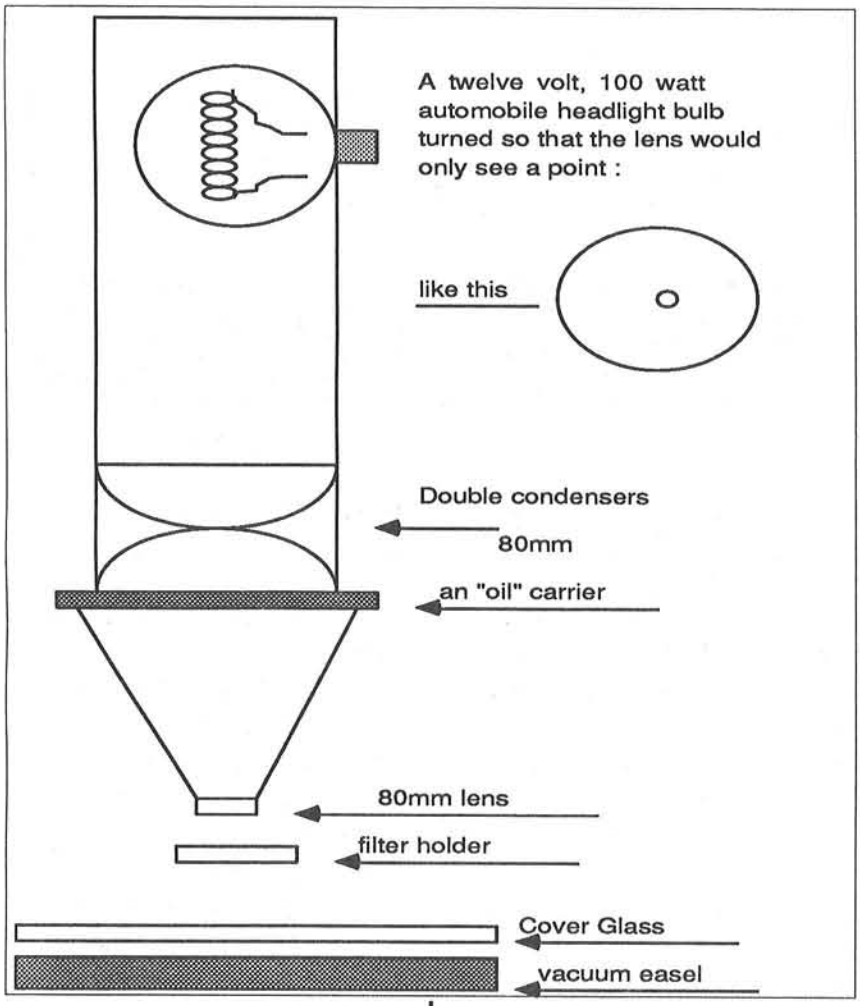
Would you place your slides in oil?

What is the fuss about "oil carriers"? If you have any experience in producing black and white prints for a living, you will, no doubt, remember the trick of rubbing some oil from the skin near your nose to smear over part of a negative in order to eliminate a scratch or abrasion. If you are a professional, you will agree with me, that this particular method of reducing scratches never really did work well.

In 1948, when I joined the Dye Transfer lab called "Evans & Peterson" in New York, I witnessed a new approach to eliminating scratches and abrasions. Both Ed Evans and Glen Peterson were very able to "invent" new systems and capitalize on their ability to build their own photographic tools. In this case, however, they wanted to make enlarged 8x10 separation negatives from 35mm transparencies, so that the image would hold together without the grain of the separation negative material being a factor. They also wanted to have the sharpest image possible. The problem that they ran into was the fact that the 35mm transparency had to be placed between two sheets of glass in order for the image to remain flat, and also determined that they wanted to use a condenser enlarger in order to hold all details. But, as soon as they used glass and a transparency they counted 6 surfaces that had to be kept clean and free from Newton rings, and also encountered seeing all of the little annoying specks of dirt and abrasions. And to top it off, they wanted to use some sort of point source to make sure that the image was needle sharp. You have undoubtedly heard stories about "which is sharper, the condenser or the diffusion enlarger?" When you finish reading this article, you can make up your own mind. I don't have to. I already know the answer.

Their first approach was to build an enlarger that looked something like the example on page two. They found out that if they used castor oil between the transparency and the two sheets of glass, that they could eliminate most, if not all, of the scratches and abrasions. This was really not something new, as liquid film gates in specialized projectors have been around for a long time, but for the first time in a commercial lab something new was happening.

They also found out that the refraction, usually caused by light travelling through two sheets of glass, was virtually eliminated. After further investigation they learned about refraction indexes and how this system worked. Most scientists that work with microscopes knew about immersion fluids that had



the same refraction index as glass and were able to see their objects much more clearly. It just so happened, that castor oil had a very close refraction index to the glass we were using.

As a result, a new system for making enlarged separation negatives was born. It has been improved to a high state of the art at this time. However a few discrepancies still persist. They made the principal mask on the easel, emulsion down, then made the separation negatives by projecting through the mask in order to expose the final negative. This requires exacting pin placement and accurate film punches. The system that Kodak proposes in their pamphlet E 80 explains the use of a Matrix punch in order to have a viable registration system. For those of you who want a more professional approach to this problem, try the Condit Mfg. Co. in Conn.

When I finally opened my own lab, I made a thorough search for the correct "oil" to use. I didn't want to use castor oil because of its softening effect on emulsions, making them susceptible to damage. It was also a nuisance trying to clean the oil from the transparency. I tried many kinds of oils, including mineral oil, castor oil and then discovered **Silicon**. I tried various kinds of silicon and the particular kind that I now use is made by **Dow Corning.** This particular kind is used by the electrical field. The number is **#200.** The viscosity is a personal choice. I didn't want a gooey substance to add to my glass sandwich, but I also didn't want the liquid to run all over the place. I chose viscosity **#100.** I think it's just right. Many of my competitors feel that it is still too much of a nuisance to have to change the masks between each separation negative exposure and then to have to clean the transparency after making the negatives, but I use a simple system. I have three jars of film cleaner. I number them 1,2 and 3.

When I am ready to clean my transparency, I use a tweezer to hold the film by one corner, rinse it for ten shakes in the first jar, then again in the second jar and finally, again, in the third jar, then hang it to dry. It will dry clean and spotless without resorting to rubbing with tissue or lintless cotton.

Some of my friends in New York use "Perc, the fluid used in dry cleaning. This also works fine. It doesn't

quite have the same refraction index as glass, but some consider it close enough. The only real problem with this liquid is, that it is toxic. I would rather not use it. But for a production lab, I can see its benefits.

The reason for using oil of some sort is obvious. It will allow you to use a point source and a condenser enlarger, which will give you a negative with edge sharpness and detail far superior to a diffusion enlarger. The fact that scratches are eliminated will be a great advantage. The fact that the transparency will lie flat between glass is a blessing, especially if you have ever made prints using a glassless carrier and wondered why your image suddenly didn't look as sharp as you thought it should. But the real advantage is being able to accomplish all of these improvements and eliminate refraction. The image will be grain sharp from corner to corner, and if the sandwich is properly made, keeping the top and bottom glass clean is a relatively simple chore.

What makes all of this even more exciting is the fact that the best lenses in the world, primarily used by the engraving field, are being used to make these great new, sharp, clean, spotless negatives. The flare factor usually associated with lenses is practically eliminated.

The 105 mm. Apo-El Nikkor (which lists for $1800) is incredible for its ability to retain all of the detail in the original. The new Apo-Rodagon lenses are also quite good and cost a lot less. The main concern is to have a clean even light source , a quality lens and a quality set of matching condensers to compliment the package. The brand of enlarger is really a matter of choice. However, the registration capability of the enlarger is of utmost importance. One of the best combinations of all is the Omega, D2. This old workhorse is built like the Brooklyn Bridge and is easily fitted with a registration carrier and housing made by Condit Manufacturing, in Sandy Hook, Conn. All that needs to be done here is to add a variable condenser system to the enlarger and use 6 inch filters in the head of the enlarger. Even though enlargers have improved considerably over the years, the need for a dichroic head is of little importance in the Dye Transfer system. New enlargers can be purchased and carriers could be modified by Condit. In fact, Condit is now producing an enlarger for making separation negatives, using the new Saunders 4x5 enlarger. For those of you who may be interested in this new addition to the dye transfer field, you can call Condit at 203-426-4119.

I can assure you, that any piece of equipment you purchase from Condit Mfg. will be the best you can find, anywhere.

This leads to one more element in this quest for sharp images from small originals. The light source. Evans and Peterson made a great beginning with this point source from an automobile bulb. At about the same time, the manufactures of the Omega enlarger also made a 20 volt point source for use in reproducing microfilm. They had a complete system with a variable voltage system for the light source and an adjustable light bulb , which enabled the lab technician to position the bulb in the enlarger, with the lens wide open and get the most even light and eliminate the refraction, which is caused by the condensers, light and lens not being in perfect alignment. Condit Mfg. took this system even further my adding a meter and making the entire unit available for the Dye Transfer process. I have even used the light head made by Berkey that is used with the Omega and added my own 20 volt system made up of a transformer and switched taps to give me specific voltages, up to 20 volts.

Even the Bessler enlarger has a point source, but I recently learned that they were discontinuing its manufacture. Durst also has such a system. I would imagine that the Durst is probably the best approach, if you have the money to pay for it. In fact, any manufacturer would gladly make a unit if the demand was there.
The whole idea should now be clear to you. The diffusion enlarger is great. I use it for printing my newly made needle sharp separations. Especially if the blowup is only 2 or 3 times up from the 8x10 separations. If you are making prints for a cosmetic account, use a diffusion enlarger for your final print, but still use the sharp system for making the negatives. If you a printing weddings, then it will make little difference which system you use. The choice is yours. But if you are looking for detail and extreme clarity, there is no substitute for the system I just explained. If you have any doubts about what I have said, call any of the major producers of Dye Transfer in the U.S. and ask them what system they use for producing their negatives from small originals. I can assure you that the answer will be the system I just explained.
The technique that I use is slightly different than most of the labs in the country. I feel that the most damaging element, when enlarging anything, is the **flare factor**. You all know what flare is, I'm sure. Flare comes in all kinds of situations. If you are shooting a job and extraneous light hits the glass surface of your lens, you will get light streaks on your film. If you have a dirty lens, the light will scatter and cause flare and lack of sharpness. These are common causes for flare. But the kind of flare that I'm talking about is not usually recognized as such. For instance, if you shoot a negative of a coal miner in a cave, wearing dark clothing, and process that negative, you will end up with a something that is almost clear film. Now, place this almost clear sheet of film in your enlarger, turn off the room lights and turn on the enlarger. The result will be that you can see everything in the room. The amount of flare caused by this bright light hitting the easel and lighting up the room is disastrous, and can help eliminate most of the fine details that may be in the shadows. This will occur whether you are printing a positive or a negative. If you have a positive of a glass of milk against a white background and plan to make a Cibachrome print or a Type R print, the light transparency will light up the room when you place it in the enlarger and size up the image in a darkroom. This flare will cloud over all of the fine detail and contrast in the upper portions of the image. A white shirt with "white on white" details, and photographed against a white background, will pose a great problem if placed in any enlarger and exposed. The flare will cause many problems. It can and will distort the curve shape of a negative and cause plotting to be erroneous.
However, if you made a contact negative from this white on white image by using a contact system, then the flare problem will be eliminated. In fact, this negative, made by contact, will hold the detail and appear dense so that when placed in the enlarger for making prints, the flare is almost eliminated and the details will have a good chance of being printed. If you are working from a small original, you will have the problem of making a contact negative and then a print from a small negative, and this is where most of the grain problems arise from. The grain problem is usually caused by the fact that the separation negative material is more granular than the transparency. Especially from a 35mm.
The main reason that the lithographic field has such success is because of the

scanners that are being used. The scanners use a **laser beam** to scan on original. There are no optics involved. Screened separations can be made without ever seeing an enlarger or even a darkroom except for loading a processor to finish the Kodalith separation negatives. As a result, flare is totally gone from the reproduction field. How would you, as a color technician, eliminate flare from your working habits?

Here is what I do.

In order to eliminate flare from my separation negative system, I make my principal masks by contact. That's right, by contact. By making a mask by contact and then placing it over the original, on pins in the enlarger, I have eliminated most, if not all of the flare possibilities. To some of my colleagues, this sounds like a lot of effort, and it is. But I feel so strongly about the flare problem that I forced myself to "invent" this system. It meant that I had to have a special carrier made by Condit, which allowed me to place a piece of film in the carrier on pins. I could also place a mask on pins and have the luxury of a flare free exposure. This means changing the mask for each separation negative exposure, and I agree that it is a nuisance, but the results, for me, are worth the trouble. I don't need a point source at this stage of the game. I am able to utilize the f stops on the lens and get even greater edge to edge accuracy. This system also allows me to use the lens F stops to keep my set of exposures identical from image to image.

Sometime, I have to use a different material other than Pan Masking film in order to make clean edged masks, but that is a simple chart to produce and the results are worth it. By using the best lenses available, I am able to get excellent separations with details in the shadows and highlights that may not have printed with such clarity. If you are producing Cibachrome prints, the mask must be placed in the carrier with the transparency. Why not use the same technique when making a Type R print or a dupe transparency or even a set of enlarged separation negatives?

One way to eliminate some of the loss of image because of flare, is to make a set of negatives to the same size as the final print. Then make your matrices by contact, using an engravers large vacuum frame, and an overhead point source light.

The main thing that I wanted to dwell on was the fact that using some kind of liquid that will fill in the scratches and abrasions without damaging the transparency or compromising its colors, and also being able to use a condenser enlarger, is one way to achieve excellent spectral and grey scale information. If you rely on just a diffusion enlarger to make enlarged separation negatives, because it is easier to work with, you will be in for a disappointment.

I hope this doesn't sound as if I am not in favor of diffusion enlargers. To the contrary. I have used diffusion enlargers in my labs for all of these 45 years. But I have always insisted on getting the sharpest and most detailed negatives whenever the demands called for it.

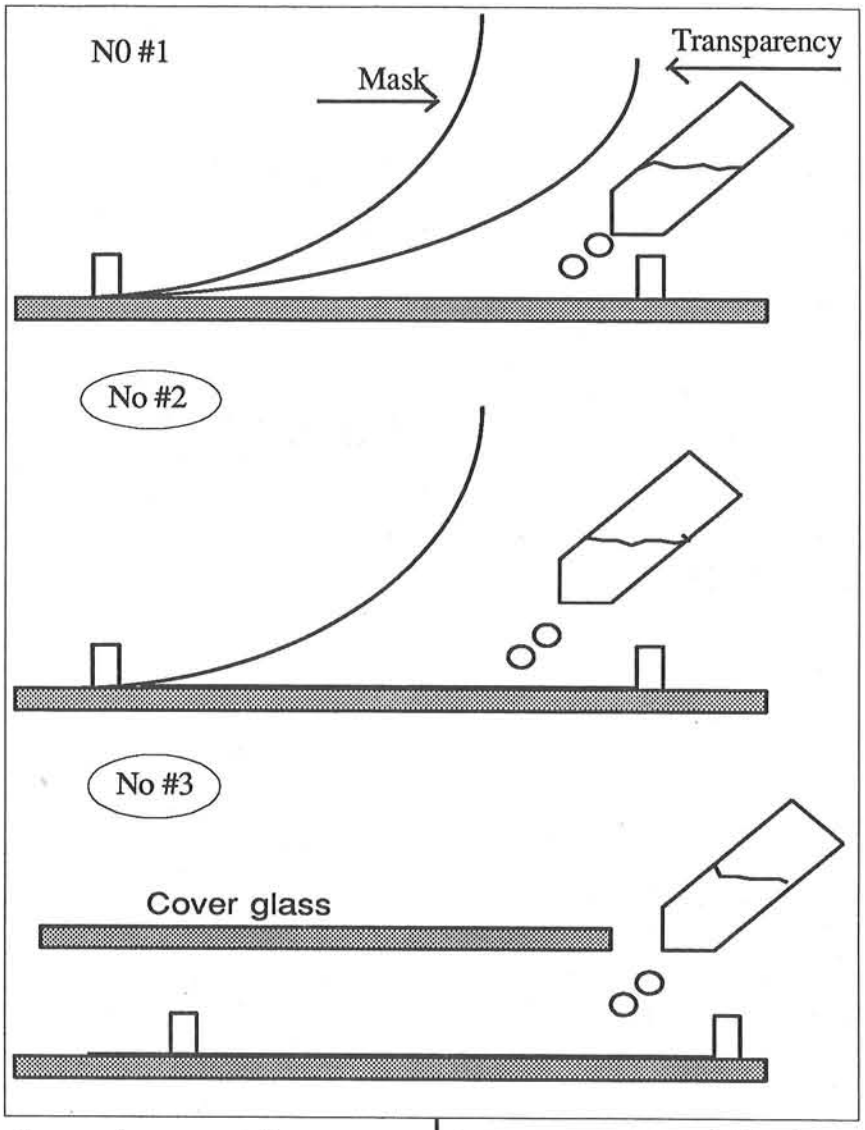
Repairing an old job

Many years ago, I was in the process of making a dye transfer from an 8x10 transparency of a very large mechanical press. Off to one side was a small black box which housed the electrical switches and little colored lights. The dye transfer print looked great except for this one area. The details in the little black box were just about gone. What had happened was that the separation negatives exhibited almost clear film in the area of the black box. This isn't anything abnormal. But the fact that I was making an enlargement allowed the area to bleed light around the subject. This is called **FLARE.** If anything in

photography is subject to criticism, it is flare. This is not an unfamiliar subject to those of us who make prints day in and day out for years. I was able to correct this problem by, first, making a silhouette of the box, then second, exposing a new negative of only the black box area onto a sheet of Pan Masking film. I didn't want a full scale negative but just enough density to help eliminate the clear film effect. This improved the print immediately.
However, at this same time, I was experimenting with the Cibachrome print process. I had made a contrast mask for this Ciba print and made a test print. The details in the black box were incredibly detailed. Upon reflection, I was able to understand what was happening. The fact that the original negatives were clear film (almost) made that area flare, but the black area of the transparency didn't flare when making the Ciba print. This opened up a Pandora's box for me. I finally understood why some jobs that I struggled with didn't work and why others were just fine. FLARE.
As a result, I began a new system of making separation negatives. Whenever I encountered a transparency that had a **"sudden black"** image, such as a black hat or a black suit, I was able to isolate this black area, re-expose another image on Pan Masking film and add it to the original negatives when making the Dye Transfer matrices. This works well with any negative to positive process.
The main reason for the success of the new scanners that have invaded the photographic reproduction field, is the fact that the transparencies are scanned with a laser beam and have no optics or air space involved. Any time a transparency or negative is **enlarged,** the flare factor becomes our enemy. For instance, if you have a transparency of a white shirt on a white background, and were to make an enlarged Type R or an enlarged Ciba print, the whites (being almost clear film) would flare and destroy much of the top portion of the curve shape of this image. On the other hand, if you were to make a contact Ciba print, or a contact set of negatives, the detail would hold far better and the negatives would be dens. enough so that the flare factor, when making the enlargement, would almost be non existent.

My system for making separation negatives.

The system for making separation negatives from small originals is more involved than most labs. In order to explain what I do, I must first give you a capsule version of what almost every one else does.
Most labs will enlarge their 35mm transparencies, and some will even enlarge the 2 1/4 sq. transparencies. The reason for making enlarged negatives is quite easy to explain. The grain that most people object to when seeing a small original enlarged to a 16x20 print, is usually caused by the fact that the original was probably contact printed in order to make the negatives and the grain is caused by the negative material and not the transparency. Making the negatives on material such as T-Max film will still not be as grain free as if they were made by enlargement.
The method they all use is based on what was done originally, by Evans and Peterson, way back in 1947. They placed the transparency in an "oil" bath between two sheets of glass and then enlarged the image to an 8x10 sheet of film. They also used a point light source. The principal masks were made to this enlarged size on the vacuum easel. And the negatives were made by exposing through the masks and onto the separation material.
Without going into all of the fine points of negative making, let us just stop here for a moment. This system works great. It will allow one to make very



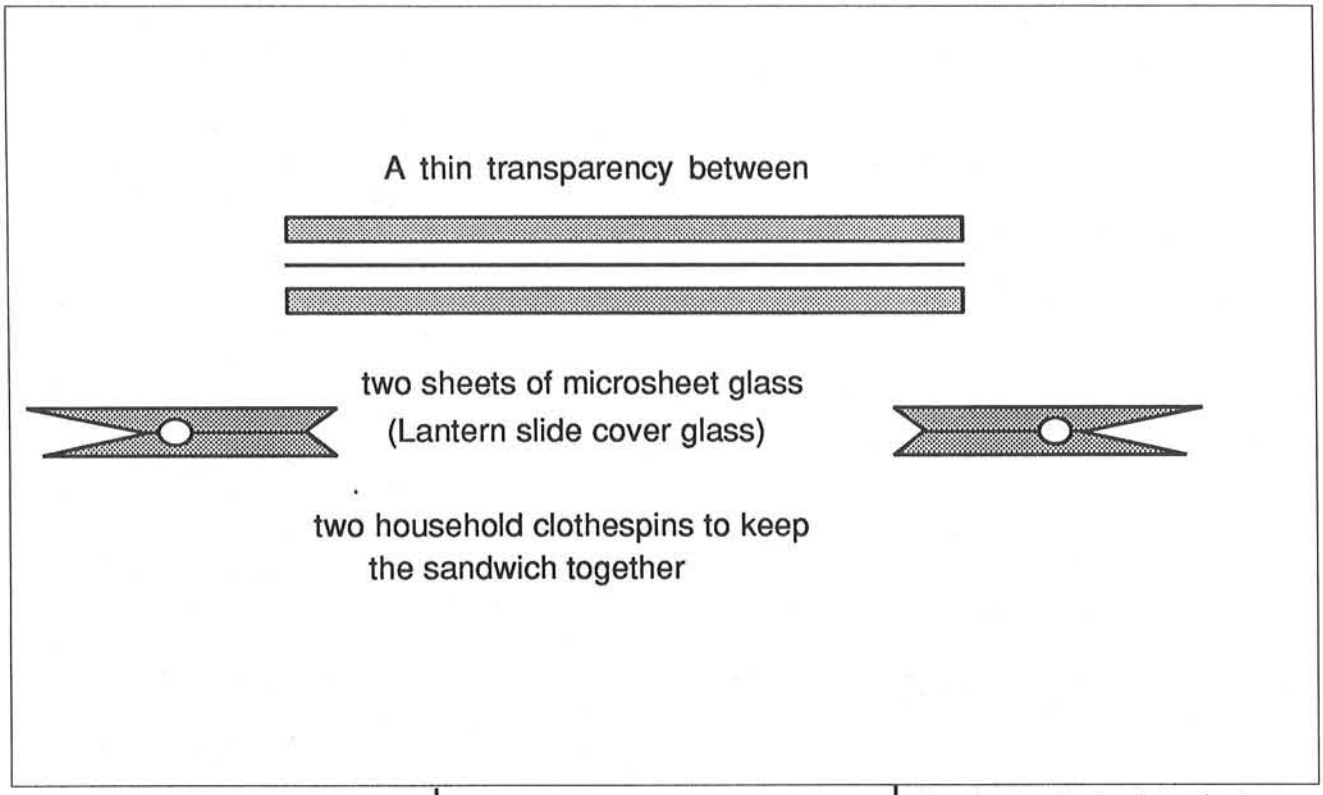
sharp, clean negatives without having to remove the transparency from the carrier during all of the steps involved in negative making. This does make a lot of sense. Don't move the original during the entire negative making process. This includes making the highlight masks, as well.

This is where I differ from my colleagues.

The flare factor so bothered me that I decided to try another approach. If I were able to reduce the flare factor by placing my masks in the carrier with the transparency, would that help eliminate most of the flare? You bet your life it would. However, it meant that I would have to take the masks out of the carrier each time I exposed a separation negative. This would be a real pain unless I devised a system that would allow me to do so without too much hassle. The system that I finally elected to use is as follows: A special carrier was made for me by Condit Mfg. This is an "oil" carrier with registration pins cemented into the glass. They have been adjusted to be accurate to within a 1000th of an inch. When I am about to make a set of negatives from a 35mm transparency, I first mount the original into a Larger sheet of film (2 1/4). I punch this mounted 35mm using a diagonal system. This system fits the carrier. The masks are exposed by contact, on a similar pin system built into the glass on my contact vacuum platen. A contact frame will work just as well. I use a tray for processing most masks, but in this case I use a Jobo processor so as not to produce scratches or abrasions on the masks. I make my masks to different percentages so that I need accuracy and repeatability when processing film. The Jobo works well. So does the Kodak's Versamat processor.

The following diagrams will indicate just how I go about changing and using the silicon oil system that I prefer. I also use a simple vacuum system to remove any oil from the carrier reservoir.

There are times when the mask will flare and cause a dark edge around a figure. This is caused by the Pan Masking film. It has a built in diffusion system that sometimes causes trouble. When I get this problem I just change film. I have used Kodak's Separation #1 film for masks. I add



100% water to my mask developer in order to bring the developing times more in line. A new chart will be necessary to make, but the results are worth it.
The first illustration shows how the oil is added to the carrier. The second illustration shows the oil being added to the second layer. After this point I will use my forefinger to press the sandwich tightly against the glass. This will eliminate all bubbles. The original and the mask are both emulsion down, so rubbing the film Will not cause any abrasions.
Illustration #3 shows the oil added to the sandwich before adding the cover glass.
At this point, it is easy to keep the outside glass clean.

If You would like to find out just what an oil carrier can do for your old, beat up slides or negatives, first make a print using either a glassless carrier or a carrier made up of two sheets of glass. Save these prints for comparison. Then make a simple system as I have outlined in the above drawing. Use castor oil for now, just to see the difference. Place the oil between the film and the two sheets of glass and squeeze the glass to eliminate any bubbles. Wipe off any excess oil and place this sandwich in the negative gate of your enlarger. Proceed to make some prints. Don't worry about color balance, just compare the difference in smoothness and clarity with the first set of prints that you made. I'm sure that you will be convinced about the need for some kind of an "oil" system for making superior separation negatives.

For back issues of "Keeping Pace"the cost is $5. per copy The years subscription is $60.

The book "The Art Of Photo Composition" is $50 per copy

Pace Color Workshops
13900 Trinidad Dr
Victorville CA 92392
619 241 0905

Thanks,
Bob Pace

Incedently, I am pre-paring a Video on the Dye Transfer Process. I have already sent out cards to prospective buyers. If you are interested, let me know.