

KEEPING PACE

A Monthly Newsletter devoted to the art of Darkroom Photography

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Point Light Sources and Their Problems

Are all point light sources the same? Are they really necessary to use in the production of Dye Transfer color prints?

The answers will vary depending on who is asked the question.

Some lab technicians believe that the point source is an absolute necessity. Some wouldn't use it for all the money in the world. Let me try to unravel this complex lighting system and tell you the real story behind its use.

During the 1940's, when I was employed by Evans and Peterson, the country's leading Dye Transfer lab at that time, the point source was just beginning to be tried for making large separation negatives from 35mm transparencies.

I remember the tiny little

bulbs that looked more like little specks of wheat than bulbs. G.E. made a bulb that was extremely small and very bright.

We discovered that it was too small and difficult to place in an enlarger light head. It required more engineering skills than any one of us had.

We also discovered that the bulb had to be centered directly over the center of the condensers, and at exactly the right height, otherwise we would get a strange light image on the easel called "refraction".

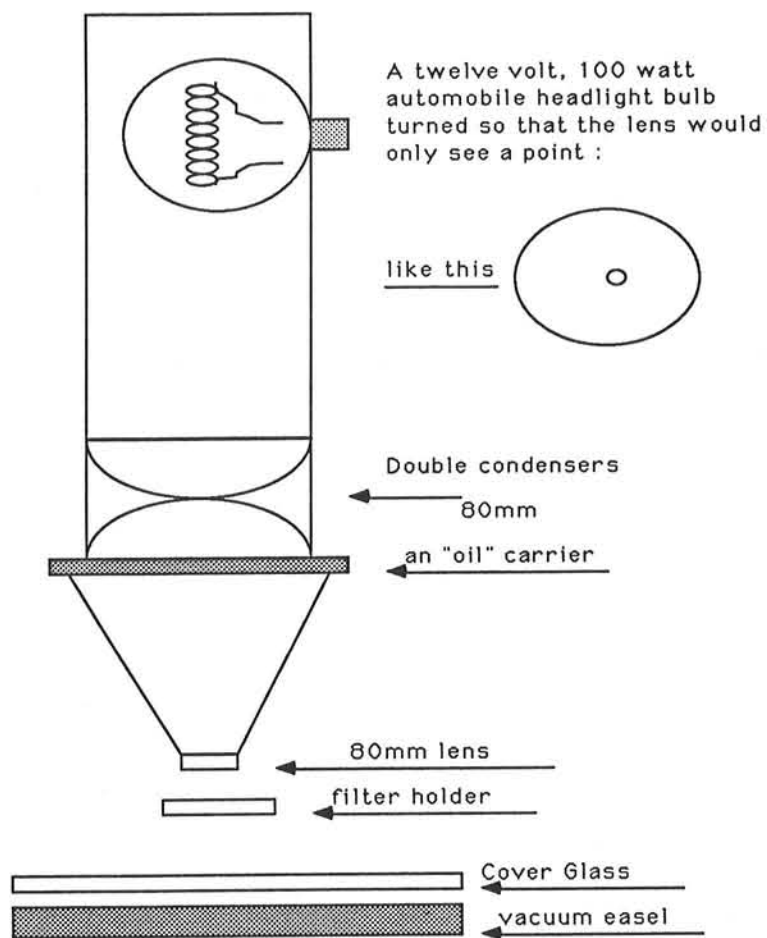
My employers were so determined to achieve some startling new "sharp" images that they doggedly tried new and different kind of bulbs constantly.

We also discovered that if

the bulb was too small the image appeared even sharper. So sharp, in fact, that every little speck of dirt or scratches and abrasions would show up looking more like railroad tracks and dirt marks than anything photographic.

Remember, point light sources have been around for many years. You will find them still being used in microfilm systems, worldwide. But these little bright bulbs were designed to be used to enlarge tiny sheets of litho film, and smooth areas didn't need to addressed.

The first successful enlarging system using a point source was designed by Ed Evans of Evans and Peterson Labs, in N.Y. City.



A twelve volt, 100 watt automobile headlight bulb turned so that the lens would only see a point :

like this

Double condensers

80mm

an "oil" carrier

80mm lens

filter holder

Cover Glass

vacuum easel

The bulb was a simple 12 volt automobile bulb. The filament was turned in such a way so that the lens could only see the end of the filament and not its entire length. This worked fine, except for the dirt and scratches.

The bulb had to be centered over the condensers and raised or lowered to the exact height in order to produce a clean, even light source, on the easel. This meant that the lens had to be used wide open. As a result, the need for a top quality lens became a necessity.

The lenses we all used in these early days were Schneider Componons, usually from 80mm to 105 mm. The condensers used in the enlarger had to be the same focal length as the lens or larger.

Evans discovered that castor oil has a similar refraction index as glass. This meant that the light that passed through the glass and oil would not bend and cause the rainbow colors that appeared along the outer edges of the projected image. So castor oil was added to the glass carrier.

The oil also eliminated most of the scratches and abrasions found in all original transparencies.

Two sheets of micro sheet glass was used. Kodak supplied the glass known as lantern slide glass. The transparency was placed between the two sheets of glass and castor oil was added to the top and bottom of the transparency before the entire sandwich was squeezed tight and held with two clothespins. It was then taped so no extraneous light would escape from around it's edges.

This produced a very sharp image on the easel. An 8x10 image was projected on the easel and all of the little scratches and abrasions were gone. The image sharpness depended on two things at this time. The light source had to be bright and tiny, and the lens had to be top quality as it would be used wide open.

At this time, Simmons Omega, the manufacturers of the D2 Omega enlarger were producing a light head to be used for micro-film projection. The light head was constructed simarlily as the standard light head, except that the lamp, a 20 volt, 100 watt Bev. was being used on a long extended tube that allowed the lamp to be positioned to the

correct height above the condensers.

Condit manufacturing used this system and modified it so that it could be used to produce enlarged images from 35mm slides.

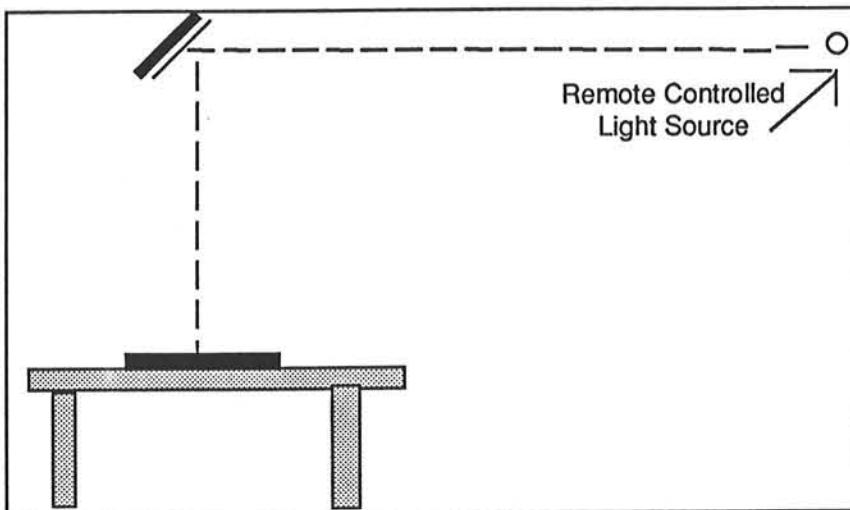
The point light source, in general, is a very uneven light source.

The K&M company, that produces the famous point light sources used by most of the photo-engraving field, recognizes the fact that the point light source used for contact printing is so uneven that they suggest placing the bulb about 10 to 20 feet away from the contact plane. If you moved the bulb as it were illuminating a white wall, you would see the unevenness quite easily.

K&M recommends that the light source be diffused if it must be used any closer than 10 feet.

The Gretag CO. makes a light source that is so sharp, that they place it 20 feet away from the exposing platen and use remote controls to change filters and light levels.

When I used the "Bev" lamp in my enlarger light source, and turned the tube that held the bulb, in a circular motion, I could see it's unevenness on the easel. I usually tried to place the most uneven parts of the light source in



areas that were busy or very dark.

Condit recognized the fact that the bulbs were uneven and lightly sand-blasted the end of the lamp to help diffuse and diminish the unevenness.

One of my students bought the best enlarger he could get, a Durst 4x5, in the hopes that their point light source would be a simple matter to use and present no problems to overcome. Much to his disappointment, he discovered that the small and very bright lamp used by Durst is so sharp that specks and scratches that could not be found when examining the "enclosed in oil" 35mm transparency with a 12 power loop, showed up as very visible scratches and dirt marks on his projected image. He even lightly diffused the bulb using Emery cloth as an abrasive. Remember, with this enlarging method, the projected image on the easel was

converted to a principal mask, which in turn, was exposed through it in order to make the separation negatives. The fact that you had to pass the image through a sheet of film on the easel in order to make a separation negative would cause some people alarm. The system was so sharp that going through a sheet of film didn't cause any harm.

It just so happens that the Durst light source was not designed or sold to be used to make smooth, clean, and sharp separation negatives from 35mm slides.

It was intended to be used as a system to enlarge up to 20 times, the macro photography used in hospitals to see differences in blood cells and tissue.

A good friend and excellent Dye Transfer technician uses the "Bev" lamp a little differently.

Instead of just using an Omega or Bessler enlarger with condensers, he uses a Lietz Valloy condenser enlarger with its white dome. In effect, he has a modified light source and gets great results with this method. Actually the light source is not a total "point" but rather a slightly diffused "point". Let's examine the thinking of the great "art photography" black and white printers of the past and present. Not one of them used a condenser enlarger, much less a point light source. They constantly bring up the "Callier Effect" and indicate that the condenser enlarger produces harsh and chalky highlights. They use a cold light instead because they can achieve smooth even results from their originals.

There is a misconception about this use of condenser enlargers when it comes to "harsh and chalky" highlights. When making separation negatives from a 35 mm. transparency or any other small original, we are experiencing a slight generation loss. The highlight areas will be compressed. Add to this dilemma, the principal mask, and you will have even more highlight compression. In this case, the condenser enlarger serves its purpose by keeping the highlight areas brighter than they

would be otherwise.

I jumped on the "sharp" bandwagon many years ago. I used the Condit system and made many successful prints for many years, until I discovered something that was important to me. I discovered what **flare** could do to any enlarger.

I realized that flare was the enemy of all darkroom technicians. Any time you projected an image, flare was present. This bothered me to such a point that I decided to experiment with a new idea that was in my mind for years.

Suppose that I were able to make the principal mask by contact, and place both the mask and transparency in the enlarger carrier. Would that method of projection eliminate most of the flare? I discovered that it could and did.

Did I need a point light source with this system? No, because the placement of the mask and transparency in the carrier would allow me to place the emulsion of the transparency at the bottom-most part of the carrier.

By using an oil immersion system I was able to retain the effects of **refraction elimination, and scratch and abrasion elimination**. Remember, If you use a point light source, you must use your enlarger lens wide

open and you must constantly be aware of the differences in the densities of the transparency and the mask.

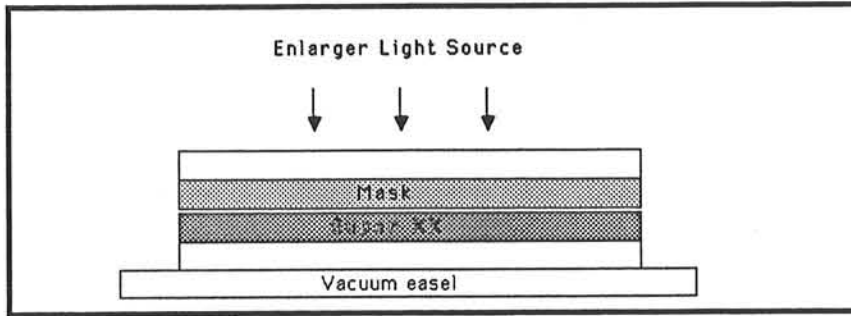
You will be using your calculator quite frequently.

With the system that I have used very successfully for the past 23 years, I am able to place my principal masks in the enlarger, along with the transparency, project the image on the easel and expose separation negatives using a 250 watt enlarging lamp in the normal light head of an Omega D2 condenser enlarger.

When I expose anything, including enlarged separation negatives or enlarged highlight masks, I can do so by adjusting the f stop on the enlarger lens and keep most of my series of exposures the same, from transparency to transparency. I can make my own light levels without encouraging refraction rings

I still use oil. I like Dow Corning's Silicon, # 200, with a viscosity of 100. It is a clean and inert fluid with the exact refraction as glass. It causes no damage to the clients original transparency.

Obviously, cleanliness is next to Godliness, especially when it come to using a point light source.



When the transparency has been placed into the oil system, the most important thing to make sure of is, that the oil is clean, and I mean, really clean.

Then the outer sides of the glasses must also be clean. Some of the labs use scratch-free Bon Ami Powder to eliminate any oil residue from the outside of both sheets of glass.

This is fine. I have also used Windex as a first cleanser and then followed by one drop of lens cleaner to each outside part of the sandwich. I get the glass squeaky clean.

If you would like to see for yourself, the good and bad things about point light sources, make two separation negatives, one using the point light source, and the second one by just adding a diffusion sheet to the condenser area and examine the difference in the amount of dirt and scratches that appear on the film as well as the overall sharpness.

I can remember a time in N.Y. City when I was making enlarged separation negatives with an old and friendly

enlarger, a Lietz Valloy, 35mm.

This enlarger has a set of 50 mm. condensers, a Lietz 50 mm lens and a 75 watt enlarging bulb set in a white dome.

I placed my transparency in a glassless carrier, projected the transparency to an 8x10 image on a gasket easel and made enlarged principal masks.

I then projected the image through the principal masks onto a set of Super XX separation negatives. No oil immersion or glass. I captured the Vogue Magazine account and made the first color print from a 35mm transparency ever used by Life Magazine. All with this little enlarger.

I still own it. It is over 40 years old and still works like a charm. It is hard to figure why I ever decided to use oil immersion, or point light sources.

I received a letter from Morry Bard, of Pompano Beach Florida. Morry is a respected Dye Chemist and has been involved with the Dye Transfer process for many years. His knowledge

of the dye field is unmatched.

He sent me a group of clipping from the Wall Street Journal and other newspapers discussing the fact that Kodak is having a financial dilemma. The papers indicate that Kodak has not been doing well in its battle with Fuji and Ilford.

There was even a mention about a possible takeover from an unfriendly source. I sincerely hope that this never happens. With all of its faults, Kodak has been in the forefront of all developments of photography since the company was first founded.

Apparently, Colby H. Chandler, Kodak's chief executive officer is embarking on another restructuring of the company. This is the fourth time in the past six years. The sales per employee at Kodak totaled \$140,000, compared with Fuji's \$380,000 per employee. When I was in business I never was able to determine the amount of revenue based on the amount of employees in my small company. Instead, I based my worth on the client list and the gross amount compared with expenses. Maybe, that's where I went wrong.

Kodak's troubles with Polaroid was also a costly event.

It is a shame, but in my eyes it is just another indication that we Americans must place more emphasis on quality and endurance.

We have had a phenomenal success in producing some of the worlds finest Dye Transfer prints ever since it's entrance into the professional print market in 1947. It is clearly the finest color print process ever invented.

The amount of manipulation that the process is capable of, is the main reason for it's success. The professional Dye Transfer labs across the country have been responsible for the many inovations and improvements in Dye Transfer print making, and unfortunately, are experiencing a squeeze from the digitizing scanners. I am afraid that the scanners are here to stay.

The hope of the Dye Transfer process lies in the hands of the new and up coming "art photographers". They will be the main reason why Dye Transfer will never die. So let us hope that Kodak gets back on the ball and makes a quick recovery, otherwise we will all be in for a shock.

Cibachrome enthusiasts should be aware that the only chemistry necessary to produce quality prints is the bleach. You can use Kodak

Dektol Developer, full strength, and Kodak Rapid Fixer for the final fix.

I have had occasions when a Ciba print was due at a specific time, and since I live in the high desert area of southern California, I couldn't always get my supplies on time.

Out of sheer necessity, I tried these various developers and fixers and found that they all do work. I would not give up using Ilford's Ciba chemistry, but in an emergency, you could finish and deliver a print without really short-cutting the process.

I have been so busy with the finishing of my video and book, that I have not been able to complete my testing of the new Dye Chrome contrast control chemistry for Cibachrome. But, I will have it done by the next issue.

I would like to say a few things about the cost of producing Dye Transfer color prints as opposed to Cibachrome color prints. But, let us begin with the equipment.

The main ingredient in any color print system is the enlarger. This is the workhorse that produces the necessary sized prints for making a sale.

One can easily be overwhelmed by the cost of a big enlarger.

I would seriously recom-

mend an 8x10 enlarger. If you have the funds to spend, then you can get a solid, well built masterpiece that will work beautifully without any problems. But if you are an average person who hasn't hit the lottery yet, I would suggest that you think seriously about an 8x10 Elwood enlarger.

The Ellwood Pattern Works Co. must have made thousands upon thousands of these ancient units. Some had wooden workmanship, and these were really old. The later versions were all made from cast aluminum. If you look in the issues of Shutterbug, I am sure that you will always find one or two of them for sale ranging around \$400.

If you do purchase one of these old timers, remove the enormous light head and replace it with a simple light box of 14 inches sq. and about 16 inches high.

Place four 500 watt enlarging lamps at the inside top of the box and place a sheet of opal plastic or glass just above the film carrier. This will be a much better light source than the old dome that came with the enlarger.

You can even purchase a cold light from Aristo Grid Co. in Port Washington, N.Y.

Instead of using the back supports and table mounting

pieces that accompany the enlarger, strip away all of the enlarger supports except for the back track. Mount a 2x4 piece of lumber on your darkroom wall across any wall studs or beams, using long screws, then mount another 2x4 board on top of that one, also using long screws. You will have just the right amount of room to mount the enlarger against a rigid wall.

You can easily level the entire unit with shims. The next item is a good lens. In order to really cover an 8x10 sheet of film in the carrier, a 300 mm. lens should be used,. **However, I have used a 240 mm. Schneider Componon lens** for years and by stopping down to f 11, was able to completely cover the carrier film.

Next is the registration carrier from Condit. This will cost close to \$300. So will the film punch that you need to fit the carrier. I have the cost somewhere around \$1300. There is no enlarger being produced today that approaches this low figure. The best part is this, there are many professional labs in existence today that still turn out the finest prints in the world with these old enlargers. What really counts is the lens, the even light source and the registration equip-

ment. Cibachrome printing is a slightly different story. The light source should be **fast**. I don't care if it is a diffusion or condenser enlarger, it must be **fast**.

When I used a 4x5 Condenser Omega with a 250 watt lamp and had long exposures ranging as high as 6 minutes, I decided to purchase a Pulsed Zenon Light source. I purchased mine from Berkey Marketing, in N.Y.C.. This light source enabled me to make exposures of about 15 seconds with the lens stopped down to f 11 and printing to 16x20 or larger from a 35mm transparency that was masked

The most discouraging thing about Cibachrome printing is the speed of the material, and the contrast.

The contrast is easily controlled. The enlarger does not have to be expensive. The light source is more important than whether it is a dichroic head or not. Hand fed filters work well. You will still need registration equipment.

In fact, I would recommend that registration equipment is a necessity for any quality darkroom work, whether or not it is in color, or black and white.

The cost will only be slightly higher than the Dye Transfer version. There is really no reason to spend much money. Being a little handy will pay off in benefits for you and your clients, too.

But here is where the differences mount up quickly. Both systems need a sink. Cibachrome must be processed in is some kind of roller processing tube. I recommend the Jobo, CPP2, It isn't automatic but works evry well.It is important to have the temperature accurate.

In the near future, when I am done with all of the excitement and pressure of turning out a video and book about the Dye YTransfer Process, I plan to write a book about the Cibachrome process.

I have been asked many questions about the process and frankly, I am astounded at the lack of expert information available about this relatively new process

When I am finished with this book, there will be a complete understanding about the professional approach to making high quality Cibachrome prints.

I will keep you informed about this latest endeavor.

The Dye Transfer process needs only a sink and lots of patience.

The reason for the sink is so that the trays and matrices can be washed properly. You will also need a sink for washing the Ciba prints retrieved from the Jobo Processor.

Most of the students that have visited me are not in a position to plunk down lots of cash for equipment. In reality, the equipment you need is as follows:

A Film punch and pin glass from some one like Condit Mfg.

You can easily make your own contact exposing equipment for less than \$50.

A contact frame is available from Calumet Catalog for \$27.

Add a pin glass to this contact frame for \$20. The biggest expense is the film punch and registration carrier. I estimate somewhere around \$400.

A bright bulb enclosed in an acorn safelight can be used as an exposing light source. The filters can be 2 inches sq. You should be able to design an exposing system..

Visit a used photo mart and pick up an inexpensive timer.

All you really need for processing small negatives up to 8x10, are two trays. One for the developer and one for the Rapid Fixer. There is enough acid in the fixer to eliminate the need for a stop bath.

Go to your local hardware store and purchase a fluorescent work light. Mount it on the wall and build a light box around it. This is so that you can examine your negatives after they have been processed. What I am trying to say is this, it doesn't need to cost a fortune to make a workable darkroom in order to make either Ciba prints or Dye Transfer prints.

My partner and I started a lab in N.Y. City with home made equipment and hardly any money. It took a little nerve and lots of luck. But we were in business.

We devoted all of our time in making prints and seeing clients with a sample case, in order to establish ourselves as top printers, in 1950.

For those of you who are interested in going into business, make sure that you know what and where your market place is. Don't expect to make Dye Transfer prints for the advertising community if you are located in a small town. The big agencies that spend the

money for advertising art work are usually found in big cities, where they can avail themselves of the different services that they require.

On the other hand, if you are planning to make prints for the "art" community, you can be based on the moon. The clients will find you if you are good at what you do.

For those of you who have sent checks to me for payment for the video and new Dye Transfer book, be patient. The packages will begin mailing very shortly.

I sure you will like and understand what I have been working on for the past year.

**The Video and Book are \$ 212, plus Calif. tax
The book "The Art of Photo Composition" is still \$50. and the newsletter subscription is \$60. per year**

I want to say thanks to my supporters. Without your help and support I would have had a very quiet life. Thanks.

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