

KEEPING PACE

A Monthly Newsletter Devoted to the Darkroom Arts

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Registration.. Can We Live Without It?

Registration? How important is it?

To really understand the great amount of problems that would evolve if registration was not available, imagine the motion picture business without registration.

The simple fact that a 35mm roll of film has sprockets built into it is the most important development in our history. Does this sound like an exaggeration?

The world would not have had the motion picture camera, nor even the simple 35mm camera that most photographers use today. The sprockets were used to move the film through a film gate in such a way, that it still boggles the mind.

The film plate would allow the film to be moved into position, then the gate would close and place pressure against the sprockets, thereby placing the film in an exact position. After the exposure, the gate would

relax, allow the film to be moved to the new position and again place pressure on the film. This constant and rapid movement created the "movie" camera.

The projector was a perfect copy of the camera, but instead of the light passing through the image and place the image on a sheet of cloth, or screen. In well over 100 years since the first motion picture cameras were manufactured, the film is still moved through the camera in much the same way.

Without the simple sprocket holes, the registration would not have been able work with such ease.

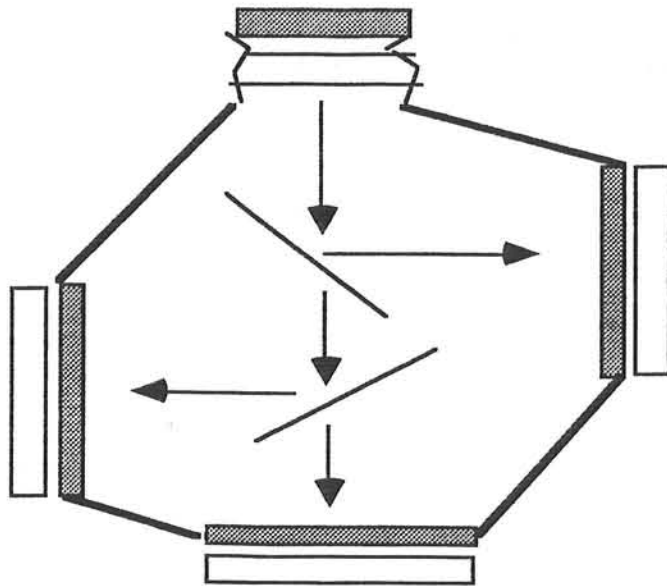
Other methods would have been found, such as the films measurements and having the film move and stop at a precise space with

equal speed, maybe.

However, still cameras were not equipped with registration devices because they weren't necessary, yet.

The 35 mm camera was invented as a result of the motion picture film's sprocket holes. The sprockets used with 35mm movie film were only used to transport the film through the film gate of the camera. This innovation was a direct result of the use of sprocket holes in the movie business. And even this function was not always perfect. In my years of handling 35mm film, I witnessed many processed film's frames with different spacing between the frames. The latest 35mm cameras use double exposure systems. Accuracy in placing the film into the proper frame spacing is important. This is another form of registration.

The first color cameras were called "one shot cameras"



because instead of exposing three sheets of color sensitive black and white film, one at a time, in a camera fixed on a tripod, it was finally possible to make one exposure and capture 3 separate images on three sheets of film at the same time. This was done, as a magician would say "with mirrors." Actually, 2 semi-transparent mirrors (called pellicles) were used to divert the image's path to 2 separate directions and exposing a sheet of film or glass plate, while at the same time allowing the image to pass through the 2 mirrors and exposing a third film or plate. If this were possible, then all that had to be added to this phenomena was a set of color separation filters placed in front of the film's focal plane.

In this case you would expect to have a great

registration system, correct? The registration effort was rather crude. The images didn't always fit each other. All we really wanted was for the film to be spaced properly so that the images could be printed and that the images would fit each other. This wasn't always the case. The first "one shot" cameras were of the 5x7 size. Eventually sizes up to 11x14 and as small as 2 1/4 x 2 3/4 were produced. Glass plates were used so that the image size changing would not be a factor. Remember, this was before polyester film bases were invented. All other films were coated on an acetate base. The degree of moisture in a room would affect a size change almost immediately. Glass was used because of its rigidity. However, even when such a camera was used, the registration not automatic, but was a simple

hand's on process. These images were used to create prints using the Carbro process. A hand's on process, if there ever was one. Your eyes and hands were used to place the image in register.

I remember using a simple, yet very effective method of producing separation negatives using glass plates (Kodak's Super Panchro Press)

The layout was rather simple. A hanging safelight with a simple 150 watt enlarging bulb was used. Provision was made for the safelight to hold filters.



Top sheet = glass
 2nd sheet -Transp.
 3rd sheet, Super Panchro Press Plate

I used a simple contact frame. However, the exposing system was bit awkward. I used a sheet of glass to hold the transparency in contact with the unexposed glass plate, made the exposure and processed the

plate according to Kodak's recommendations. The three negatives had the images reading right, emulsion up. The enlarger carrier, (An old Kodak enlarger) had provisions for the glass. The plates I just processed were the same size. All I had to do was to place the negative plate into the carrier, Period. No other piece of glass was necessary.



If I needed to use the negatives from the One Shot camera, two of the negatives had to be turned over. In this case a blank sheet of glass was placed in the correct position so that the image was always in the proper focal plane.

As a result, the amount of surfaces that could (and did) carry dust was lessened. Instead of 6 surfaces to worry about, I only had 2. I remember processing these plates in the same hangers that are used today. I was extremely careful and made sure that the images all faced the same direction. One of the problems in the early days was the fact that registration was always done later by hand and by eye. A sheet of clean white paper was placed on the easel. The projected image on the easel was traced then with a sharp pencil. Using the original Matrix film

(the Wash Off Relief Process) the image was exposed. Then the next negative was placed into the carrier. The carrier (not the easel) was maneuvered around until it fit the traced image as closely as possible. The third image was similarly treated.

Why?

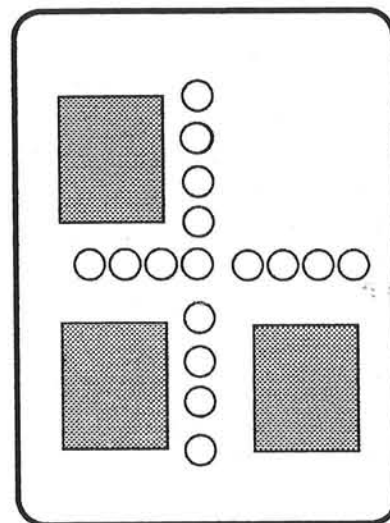
We had found out that there is no such thing as a perfect lens, especially in 1946. If you didn't try to get the image on the easel to almost register each time the matrix was exposed, it wouldn't fit. It would be distorted enough so that the image would not fit properly.

However, glass plates allowed us to make fairly accurate prints with as little distortion as possible

Did glass plates work?

Yes. They certainly did. I made many Carbro prints that began with glass plates. The plates were not easy to process. We used film or plate hangers, the same kinds still being used today. They were invented in 1919. The reason for the plate hanger became evident if you ever tried to process more than one plate at a time. Remember, all three plates had different developing times because of the color sensitivity and speed of each plate. In order to bring all three images to the same degree of contrast and density, (using grey scales to prove our point) we would either process one plate at a

time (good move) or if we felt like being suicidal, we would process all three plates in a large tray. Obviously, we weren't going to leaf through the plates as if they were flexible films, but we devised a method of our own. In an over sized tray, we placed suction cups in such a way as to keep the three images separate.



Very little use of the hand's were needed here.

All we needed was good tray movement. The second and third trays were equipped with similar suction cups. This gave us excellent agitation and smooth development.

The use of plate hangers had their problems. They still do today. The little holes built into the hanger would allow more movement of developer through the holes and cause "pump marks" along the edges.

Also, if the images were not

facing the same direction when hangers were used, a new sensation called "wedging" would occur.

Uneven development would cause otherwise smooth backgrounds to look like rainbows.

The sprocket hole idea was just beginning.

Dr. Kalmus, the inventor of the Technicolor process used the idea of a "one shot" camera and developed a rather large and clumsy Technicolor camera. (Film speed of ASA 5 1914)

This feat was incredible. The idea of the image passing through semi transparent mirrors and still hold the density and sharpness needed for top quality images was perhaps the most important thing ever invented for photography.

It was because of the sprocket holes, that eventually, motion picture color negative films were invented which totally made the Technicolor process obsolete. The new C-41 films can be as fast as 400 ASA Now, the three necessary images are in perfect position right from the start. This made a dramatic change in our still photography processes. The Carbro process died when the Dye Transfer process and the Type C processes were born. Especially the Type C process.

The colors were not necessarily better, but the

process was much easier.

The idea of sprocket holes was picked up quite early by the graphic arts industry. Punches were made that would make as many as 20 holes along one edge of film, and when placed on a board with the same sized pins and in the same position, print registration was born.

However, the early Carbro process was such, that registration was still a "hand's on" process. The pigment sheets and the black and white photographic sheets and even , the final support sheets expanded and shrunk in ways that would destroy any possibility of a registration system being developed.

The new UltraStable and EverColor processes has eliminated the need for any "hand's on" registration. It is so simple, an 8 year old kid of any sex can handle it.

This is all well and good. Registration is here. Or is it? You are a print maker at home in your own private darkroom. Registration equipment is not cheap. There are many forms of punches and pin systems available, for a price. For instance, a simple three hole punch used for making holes in paper and used in a loose leaf book, could be used. The 1/4 inch pins are available from many graphic

arts supply companies. If you wanted to get fancy, purchase two such punches and mount them on a board so that you can produce 6 holes at a time. Are these pins and holes accurate? It depends on what you need for accuracy. If you are trying to register the hairs on a head, then I would look for a more accurate system. However, if a "close enough" look is all that you are after, this may do.

The best of this type punch costs around \$35. It can work.

Suppose that you have no registration equipment and need to turn out an image. **Here is a challenge for the beginner in the darkroom.** A client has a 2 1/4 x 2 3/4 inch color negative and wants a horizontal 8x10 print. So far so good. But then he decides that he wants a line of black type across the bottom of the image describing the events and the contents of that particular image.

He only describes what he wants to say in the text. He knows that you have a computer and can easily produce a line of lettering (typesetting) to any size and format he desires.

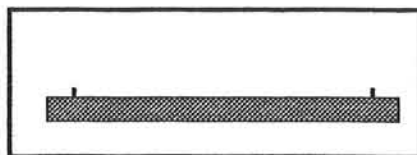
If you own a computer use Helvetica, 12 points bold, and make it fit across the bottom of the page. Position it so that it falls into the correct area and would look fine.

Make a full size image and copy it, to that it is now a film negative. (black background with clear lettering)

A simple registration system (for position only) could be as follows.

Somewhere in your photographic closet is an empty paper or film box that is larger than the print you are going to produce. Place your easel in the bottom portion of the box in place so that it will not move. The paper should fit into the easel with repeatability and accuracy. Before taping the box in place, move the box with the taped easel until the position for the image is accurate. Make an exposure of the image and process it. This sheet will be your positioning example.

Place the dry print in the same position in the easel and then place the film negative over the image. Is it in the correct place? Is it hard to see because it is black? O.K. then make a reverse of the image by contact, so that it is now a sheet of clear film with black type.



A light tight box can be used to facilitate registration.

Now you can see exactly where the lettering should lie. Replacing this lettering sheet will be all that is necessary for placing the lettering in the right place.

Now, remove all the films from the easel. Make a good print by trial and error. Cover the box with it's cover. Place a sheet of unexposed paper on the top of the box. Then make one more exposure. Process this print. Then after it is dry, manually register the same print to the top of the box using the projected image and your hands and eyes. Tape it in place. This will be your guide for the future finished prints.

Now you can remove the negative from the carrier and just use white light. Make a test exposure of the lettering. When you have found the magic formula, you can proceed to make the final prints.

Remove the box cover and simply place sheet of unexposed paper into the easel. Place the sheet of lettering film over the paper, in place on the easel, then place a sheet of glass over the sandwich on the easel and expose the lettering. Then remove the film lettering only and replace the box cover. Now you can project the image onto the box cover and by moving the easel or the image in the carrier, (or both) register the image on

the box cover by eye. When you are satisfied with the position, and you are sure of the *f* stop, remove the cover and expose the sheet of paper, process it and I am sure that you will have a print with the lettering where it belongs. The only registration equipment needed was your own eyes and hands. However, if you have the proper equipment, this seemingly difficult chore is a very simple matter to deal with.

If you have a registration carrier for your 4x5 enlarger with pins set in glass, and a matching punch, and for the bottom of the set up, an vacuum easel with a set of diagonal 1/16 inch pins and a matching punch, all you need to do is to mount the small color negative into a 4x5 sheet of old film of the same thickness.

Punch it. Then before you even think about color balance or density of the image, let us first make the correctly positioned lettering mask. **Here is how.**

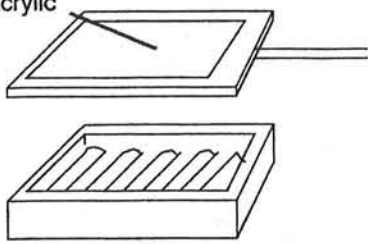
Make a copy Litho negative of your typesetting lettering. Any size up to 8x10 will do. Blow the lettering up to the size you wish the final print to be. Make a quick B&W print for positioning. Punch the paper before exposure and processing. Use the 8x10 diagonal punch for this job.

Save this test print.

Now, with the image negative in the enlarger size it up until it covers the lettering the way you want it to. Use the image to find the area of acceptance for the lettering.

Once the lettering is in the proper place according to the image, shut off the enlarger, replace the image negative with a sheet of unexposed raw Litho film, punched emulsion down, and on the diagonal pins. Using lights situated on either side, or if you have even better equipment, place a light source (light box) beneath the diffused plastic easel and make an exposure by turning the light source on and off.

A vacuum platen made from diffused acrylic

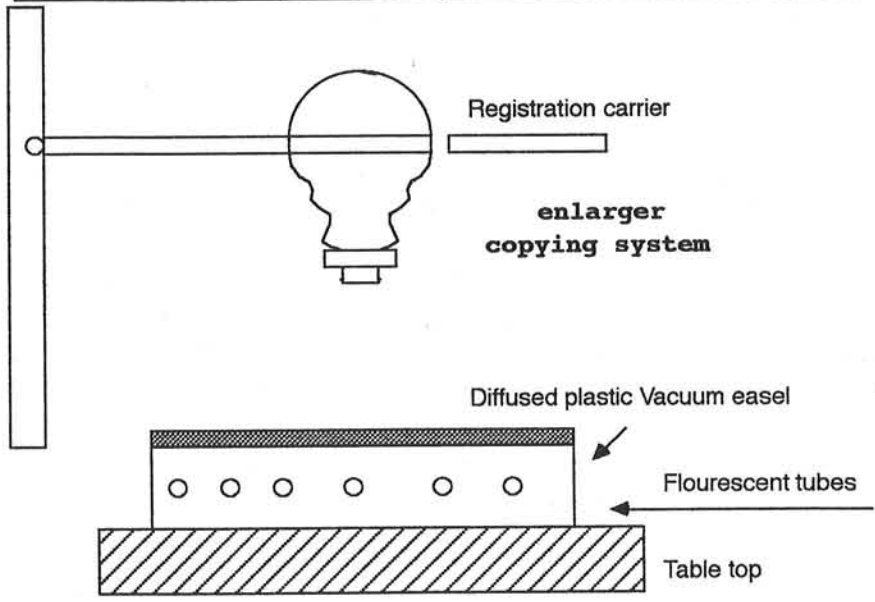


The resultant image in the carrier, after processing, will be a perfect fit and will also be in the correct placement. Now, make an exposure of the image, then, either in the dark, or by first removing the paper in the easel, replace the negative with the newly produced Litho film. It should be totally black except where the lettering should be. Now expose for the black lettering. (Or any other color.)

The advantage here is that you can decide to change the size of the print, and all of the elements will be there, still in the correct position and ready for exposure.

Here is a sample of what your enlarger can be used for besides making prints.

a large light box. Then a sheet of Rubylith material is punched and laid over the litho image image. Using a sharp knife (Exacto) score, do not cut, the image and when completed, peel away the inside of the image. You have now created a **Frisket**.



With this kind of set up, and with a an enlarger that is capable of being locked into position. you can change the enlarger into a camera.

With this kind of arrangement, you can make any kind of accurate frisket with fear of losing edges. If an image is made to the size of the easel. (let's say 20x24) and it is made with registration being the case, A sheet of Litho film can me punched, placed on the easel, ecxposed and processed. Then, using a large light box with registration pins, place the dried litho on

Place this new frisket back on the easel. replace the image in the carrier with a sheet of unexposed Litho film, then turn on the lights below the diffused plastic easel.

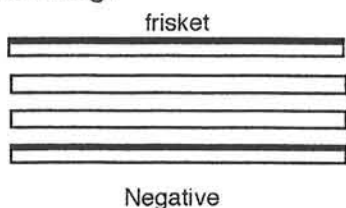
You are now exposing the image back to the focal plane of the enlarger. Process this new sheet of litho and use it as a complete silhouette mask. Place it above the image in the carrier when youn are ready to make a print.

What? You want to make a soft edge mask? There is no such thing, if there are two images to worry about.

Whenever a frisket is used in the carrier, you have an option.

Where in the line up of material is the frisket mask to be placed? Should it be next to the glass and below the image, or above the image.

If you wanted to make a soft edged mask, then do the following.



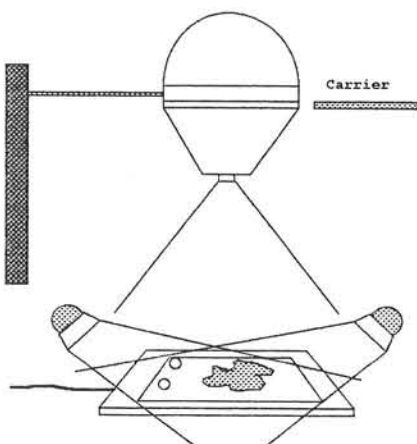
Place diffusion sheets between the negative and the frisket. All sheets are placed on pins

Do not close down the lens too much. In fact, work with a wide open lens. This will assure of a sharp image when focused on the negative, but an out of focus image at the focal plane of the frisket.

If a sharp reverse of the negative is required, make sure that you have a very tight fit with the two sheets of film, and that a contact or vacuum platen is used.

Make sure that your films are oriented in the correct fashion. **Emulsion to emulsion.**

Incedently, it isn't always necessary to have a back- lit easel. Use a copy system as follows and you can easilly copy any image. In fact, if you wish to copy art work or other photo's, it will work fine.



If you want a specific size copy, make a drawing on a sheet of clear film, place it in your carrier and project it onto the intended art work.

When you have the art work in the boundries of your projected drawing, and the outline of the drawing in the carrier is in acurate focus, then you

you can proceed to use your enlarger as a camera. It will work fine.

In fact, the vertical cameras that are in vogue at the present time are simply designed as if they were enlargers, and placed up side down. The newer versions produced by Agfa are remarkable. They have a "computer" aboard that once you establish the requirements of the camera, and you have chosen the copy size percentage and choose the kind film you are about to use, the camera goes automatic and provides the exposure.

If you really want to get modern at a fraction of the cost of a commputer, purchase a processor such as the Jobo CCP2. It is not automatic, but extremely reliable and inexpensive.

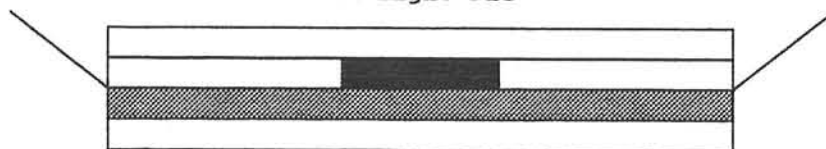
So, as you can plainly see, registration is not an thing to ignore.

Without registration, you will have to be satisfied with mediocrity. With registration, the world of ideas will explode in your imagination.

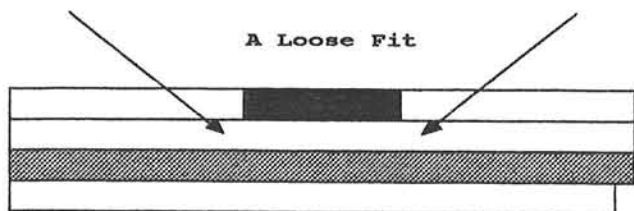
O.K. What has happened to our beloved Dye Transfer process?

My last call from the good Doctor describe a bit of a problem. However it is not a big one.

A Tight Fit



A Loose Fit



Dr. Petterson did make a 200ft. run of the new matrix film. A few labs have experimented with it and found it to work fine. The only drawback is it's speed. It is about 2 times slower than the Kodak brand. (Kodak still hasn't opened up with the necessary details) However, from my viewpoint, the material isn't too slow. A full stop or slightly more isn't enough to discourage me. Dr. Patterson said that the run looked slight uneven. A new run will begin at about the time this newsletter reaches you. I am anxiously awaiting the day when I can get some material and make a new Dye Transfer print.

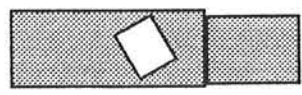
A few words about Kodak and what they are up to. They are going all out for the digital cause.

The latest MacIntosh computers that are geared to work in the graphic arts field are all being sold with the fact that Kodak is including their own Color Management system with almost all of the digitizing programs (like photo shop) that will allow the ordinary worker to see what he sees on his screen, and print it out on a subliminal printer and match the screen, and eventually ship the information to a service company and the colors will still match what you started with. This alone, sounds incred-

ible. A few short years ago, I visited the Electronic trade show here in Las Vegas, and the idea of color management was still a germ of an idea. No one really had anything then, except hope. I am currently working in a Vegas Photo shop that caters to the large hotels and casinos. The art work they need can be produced with a scanner and a digital workshop, but for some reason, the conventional system still has a place. I only wish I could afford to make a bunch of color prints just to show you what is possible with simple dark-room materials and equipment. The only expensive thing I am working with are the registration tools.

In order to make the colorful images, all I would really need is a vertical camera, and just a color head.

No enlarger would be necessary. A color head could be placed on a shelf with a hole cut out of it for the light source to spread it's light on a vacuum easel. A simple gadget used to crop imagfes for a client, could be used as an *f* stop tool .



A good easel meter such as the ZBE or a new version of a very old system is called the Pixtronic meter. Back in the early 1950's a similar unit sold for about \$25. This new version sells for \$219. and from the news I have received from one of my readers it works like a charm.

Believe it or not. The most important tool to own is such a meter. With this kind of meter, you can read the light and dark areas of a 35mm slide with accuracy by simply enlarging the image to a comfortable size. Read the details on the easel. In fact, most densitometers are built in such a way as to make it almost impossible to see the areas that must be read.

This meter is sold by:
Pixtronics
605 E. 59th St.
Brooklyn NY
Phone 718-531-3381



Thanks,

 Bob Pace
 2823 Amaryllis Ct.
 Green Valley NV 89014
 702-896-2515