1987

Exposure testing with Polaroid materials

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If you use a Polaroid camera for test exposures you probably have realized that while the process if quite effective it can run into a rather expensive proposition. Under certain circumstances, such as when working on a low budget production or when you are simply experimenting on your own, it may be practical and appropriate to attempt to save on this process by trying some of the procedures summarized below.

The obvious way to reduce expenses is to make one sheet of film do the job of a number of separate exposures. One way to do this is to simultaneously produce a number of exposures on a single sheet of film so that the best one can then be used as the basis for exposing conventional film. This can be accomplished by installing Neutral Density filters in your camera back just in front of the film plane or ahead of the film in each pack. This way, when you make one exposure you generate a series of stepped exposures all on one sheet of film.

I have found the following system works very well for me. To start with, I assume that the type 667 film which I use has a speed of 400 rather than 3000 and I insert a neutral density filter matrix just in front of the film surface and attached to the pack's gate at the top or bottom edge. The filters are of .3, .6, .9, 1.2 and 1.5 in strength and they are arranged so they cover up most of the image gate of the pack. I use .3, .6 and .9 filters to make my matrix since the higher whole stop values are hard to get. To make the 1.2 section of the matrix I simply overlap the .3 filter onto the .9 and add the .6 filter to the .9 to generate the 1.5 value. While the light has to go through two filters this way the loss in quality is negligible. I've used two different ways of assembling the set and they are illustrated in the attached illustrations.

After loading the modified "exposure testing" pack into the camera the next step is to make a light meter reading and expose the film. If it is exposed properly, then the area behind the .9 density patch will appear correct in density. If the film is underexposed, then areas below filters of less density will appear to be correctly exposed. If the .6 patch looks correct then underexposure is one stop, and if the 1.5 filter patch looks correct then overexposure is two stops. Thus I am able this way to determine the correct exposure for 400 speed film, such as Tri-X, with which I am quite familiar, and it is an easy matter to modify this exposure to apply to other films that I commonly use.

You should remember that if you now remove the filter matrix by unloading the pack from the camera and shoot the 3000 speed film without the filter matrix in front of the film, you must underexpose by three stops against the exposure required to make your test strip assuming that the area under the .9 patch was correctly exposed.

The same scheme can be devised for use with sheet film type Polaroid materials except that the filters will probably need to be somehow attached to the holder or to the camera body itself just in front of the film holder.

Neutral Density gelatin filters are of course available from the Eastman Kodak Company at a cost of about $10 for a 3" square.

Since for this particular application you may not need the level of optical quality provided by these filters you could attempt to make your own by fogging black and white film. You could generate a wide variety of density values using 35mm film, such as Plus-X, by running an exposure bracket series in increments of 1/2 stop with the subject being a blank, uniformly lit wall or sheet of paper or 18% grey card. You should bracket widely both under and over the proper exposure which is required. This way you will have very thin to quite dense pieces of film.

To determine the density of various pieces of film so that you can use them as Neutral Density attenuators as described above, simply set up to make a light meter reading normally and after noting the meter deflection place the piece of film whose density you wish to test in front of the meter cell. If the needle drops one stop then the density of the film is .3 . A .6 density corresponds to a drop of two stops, .9 of three, 1.2 of four and 1.5 of five stops.

Should you use 35mm or other format film as the attenuator material for your filter matrix you should make sure that the filters are as close to the film surface as possible. The reason for this is that photographic emulsions which look quite transparent to the eye are actually somewhat turbid in character thus producing a diffuse looking image if the improvised filter is not in direct contact with the film.

Another way to produce a bracketed exposure series is to sequentially, rather than simultaneously, give the film a variety of exposures. This method is applicable to sheet film cameras or pack-type cameras or adapters that have a dark slide.

One scheme for doing this is to attach the camera firmly to a tripod and partially removing the protective slide or envelope with each successive additional exposure. The problem with this method is that it is a little more difficult to set it up so that the exposure varies by exactly one stop from step to step. This is because if you simply add another exposure at each pause, the increments are going to be arithmetic rather than logarithmic.

The proper way to produce a conventional exposure series when you are adding exposure is to first expose the whole sheet and then add the appropriate amount of extra exposure at each step to generate a logarithmic scale. For example, after you have decided on just what your least exposure of the series should be you would expose the whole film to the scene at that exposure. Then, after inserting the envelope or dark slide back into the camera about an inch or so, you make a second exposure identical to the first one thus adding a 100% increment to that which the film has already received. For your next exposure, after covering the film up another inch, you make the next exposure at one stop

greater level than the second one thus adding a 100% increment to the previous step. For the next one you add one more stop and so on. This way the exposure from step to step will always increase by one whole stop.

If your series started at what you calculated to be two stops less than proper exposure and in fact this was correct, then, assuming that you made a series of five bracketed exposure, you'll have a proper exposure in the middle portion of the sheet flanked by plus and minus one and two stop "brackets".

The only difficulty which I've encountered with this method is that the sheet of Polaroid film tends to buckle a bit as the cover envelope is being reinserted and you may find that the various exposures do not register precisely. This is often only a minor problem. It is not a problem at all if you are using a pack system where the dark slide does not come into direct contact with the emulsion surface. It also works very well if you attempt this expsure testing method with standard 4x5 sheet film and holders.

The methods mentioned above will produce test exposures where different areas of the scene that the camera is aimed at are exposed at different exposure levels. However, you may wish to compare a particular scene or portion of a scene to itself at varying exposure levels. This is a bit difficult to accomplish with sheet film cameras but pack type cameras or holders can produce test results like these quite easily. It is done by masking the camera back so that the right side of the pack (the trailing one as you insert it into the camera or pack adapter) or the back, is covered up with an opaque mask leaving an open slot about one inch in width at the opposite end.

Then, after taking the first shot you pull the white tab out one inch. After the next exposure you pull it out another inch and so on. After you have finally completely removed the white tab you process the film normally. On the processed material you will find a series of rectangular images of the same scene. The part of the scene you'll actually be photographing will be located at either the left or right edge of the camera's viewfinder depending on the camera that you use. By properly orienting your camera and adjustng the exposure settings appropriately you'll have a bracketed set of exposures of the same scene all on the same sheet of film. On 667 film I make 4 exposures each about 1 inch in width while on the longer film intended for 4x5 cameras I am able to fit in 5 of them.

I have attached a paper tab at the edge of my camera marked off in one inch increments starting with the farthest edge of the white tab extending from the camera's side to aid me in judging the correct amount which I need to withdraw after each test exposure. The first, or reference, mark is located at a distance equal to that at which the edge of the white tab is when fully tensioned but before it starts to move out of the pack.

In order to ensure that you are including the same area of the scene in each segment of your test series make sure that the camera does not move between exposures. If you do not place the camera on a tripod use a reference mark within your viewfinder and align it repeatedly with some feature in the scene which can be identified easily. I find that the rangefinder spot in my camera is small enough to serve as the visual reference mark.

One more thing, should you ever have the need to remove the film pack from a Polaroid camera this can be done by simply opening the back and removing the pack. This will generally only ruin the top sheet of film which in the unloaded state now becomes the protective cover. If you do not wish to lose even this one sheet of film you could attempt the following method by which I have successfully saved many a sheet of film.

Make a replaceable protective sheet or "dark slide" out of the cover sheet you withdrew from the pack when it was loaded in the camera according to the drawing below. In order to remove the pack you first need to insert this substitute protective sheet back into the front of the pack. It needs to be inserted at the far right edge, just below the white pull tabs. It is easier to start the process if you get a corner started first and then straighten out the sheet while pushing it gently but firmly down into the slot.

It is important that the leading edge of the replaceable cover sheet not have a straight leading edge for this will tend to get hung up on the far edge of the pack gate preventing complete coverage of the gate thus fogging the film. A diagonal edge or a concave one will usually prevent this from happening. The correct length of this mask is found by inserting it into an empty pack so that it just covers the image aperture of the pack.

Use this procedure in subdued light and store the pack in a dark place like a desk drawer. When reloading the camera remove the cover sheet after replacing the pack in the camera but before closing the back. Keep some pressure on the pack end to prevent it from lifting out of the camera as you pull the improvised cover sheet out of the pack.

And finally, did you ever wish your Poalroid camera had a groundglass if you are using it for applications such as improvised photomicrography or other technical purposes? You can make such a device by simply taking an empty film pack apart and inserting a piece of groundglass of appropriate size in place of the pressure plate. Use a tough cement to hold it in place. I've found two part epoxy type cements to be most applicable. Groundglass is available from Edmund Scientific Company.

While still on the subject of Polaroid, saving the negative which is produced with each positive print is often not attempted. While there are various chemical ways of saving the product one way in which rather interesting results can be obtained is by gently washing the negative after peeling the print off. Then, after it is dry, copying the negative with a high contrast negative material and making a positive. I've done this by copying the negative onto Kodak Technical Pan film and the results were quite acceptable, at least from an unconventional imaging point of view.

Further enhancement of these Technical Pan transparencies was achieved by duplicating them onto Polaroid Polagraph high contrast positive film with a slide copying device.

You can read a whole article on how to elaborate on these paper negatives and see some examples by choosing The Phoenix Process to read the text or look at some photographs first.