KEEPING PACE

A monthly newsletter devoted to the art of darkroom photography

Volume 4 October 1987

A Further Explanation About Masking

In my last issue, I wrote about masking. I explained how each enlarger was capable of producing its own contrast with any material. I explained how to determine just what the proper contrast of the mask should be for any specific material.

Now, I will explain how to derive the information that is required in order to make a mask that will "fit" the occasion.

If we know that we need a 25% mask (gamma .25) the only thing to do is to make an exposure, by contact, of the transparency onto a sheet of Kodak's Pan Masking film and choose a development time that will produce a 25% mask.

The procedure is as follows:

Using a contact frame or a professional vacuum print platen, make a series of exposures of a Kodak three step grey scale (Q6C) by contact, on a sheet of Kodak's Pan Masking film. Use a red 29 filter to begin with.The light source should be should be at least 100 watts. The Kelvin color of the bulb isn't too important as long as it is repeatable.

Make the exposures beginning with one second and doubling it each time. If you make room for eight exposures then the exposures will start with one, then two, then four, then eight, then sixteen, then thirty two, then sixty four seconds.

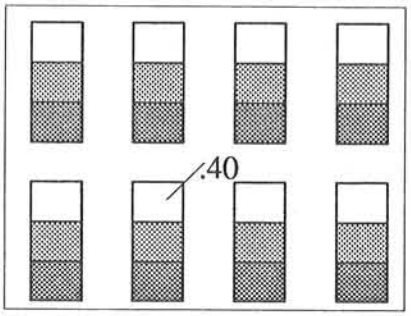
Do the same series of exposures on a second sheet of Kodak's Pan Masking film. You must have **two sheets of film identically exposed** in order to make this simple chart that will give you all of the numbers that you will need.

Just a word about the kind of film that should be used in making contrast reducing masks. Just about any kind of panchromatic film could be used, however, Kodak's Pan Masking film was designed to be used for this purpose. It is a soft and diffused material which makes registration a bit easier and is also missing any anti-halation coating on the base side, thereby enabling this material to be exposed through the base side for special kinds of camera back masking. If conventional films are used, the developer must be diluted to such a degree in order to achieve low levels of contrast, that the curve shape may be distorted.

The working part of a Three Step Grey Scale

At any rate, we now have two sheets of identically exposed film. They must now be processed.
What kind of processing system should we use? I have tray processed for many years with complete accuracy, but it takes a repeatable agitation system and absolute temperature control. If you own a Jobo processor or any kind of tubular processing system system, then you need not worry as much about repeatability. If you have a large continuous processor, such as a Versamat or Pako, then you really should have no difficulty in repeating the processing times.

The kind of developer is important enough so that you won't be using a high powered developer and be forced to use very short development times. I have found that Kodak's H C 110 developer at a very high dilution works just great. I use a mixture of 80cc of concentrate to make 1 gallon of developer. And I use a standard of 68 degrees as my temperature. I usually use about 1000 cc of solution to process two or three sheets of film in a tray.
The procedure here is to process these two sheets of film at **different times** in order to be able to find the contrast that is produced at each time.



These scales would actually be in different levels of density.

Once the exact contrast is found at each time, all that is required is to make a chart (see illustration) and place a dot wherever these two development times and contrasts (gammas) cross each other.
Process the sheets as follows: The first sheet for one and one half minutes (1 1/2 Min.) and the second sheet for five minutes (5 Min.)
Wash and dry these sheets and then using a densitometer, find and read the lightest steps of the three step grey scale on the masks. Try to find one that reads .40 on each sheet. Mark these two steps and note the exposure time that was required to produce a .40 reading.
You now have two important pieces of information. You know the exposure it required to achieve a .40 reading on the mask regardless of the developing time, and if you read the high and low ends of that same grey scale image you will also have a **density range** for each sheet of film.
A simple method of determining the contrast (gamma) of any sheet of film is to plot a curve of the new material against the original grey scale. In this case, the three step grey scale (Q6C) represents the straight line portion of any curve, and if you read the high reading and subtract the low reading you will end up with a density range. If you **divide the original density range** into the **density range of the new mask,** the result should be the contrast percentage. **(gamma).**

The chart will enable you to find the correct exposure and development time for any situation.
1. Find the exposure on the right side of the chart and where it crosses the 1 1/2 Min. development time, place a dot.
2. On the left side of the chart place a dot where the gamma and the development time cross and place a dot.
3. Repeat steps 1 and 2 for the 5 min. development time.
4. Draw a line between the two exposure dots and another line between the two gamma dots.
You will now be able to find the correct exposure and development time for any strength mask that may be required.

Here is how to use the chart.

First, determine just what contrast level (gamma) your transparency requires, then look at the left side of the chart and find that percentage.

Let you eye follow that line towards the right side until it meets the gamma line. At that point let you eye follow that line down to the bottom of the chart and there you will find the proper development time.

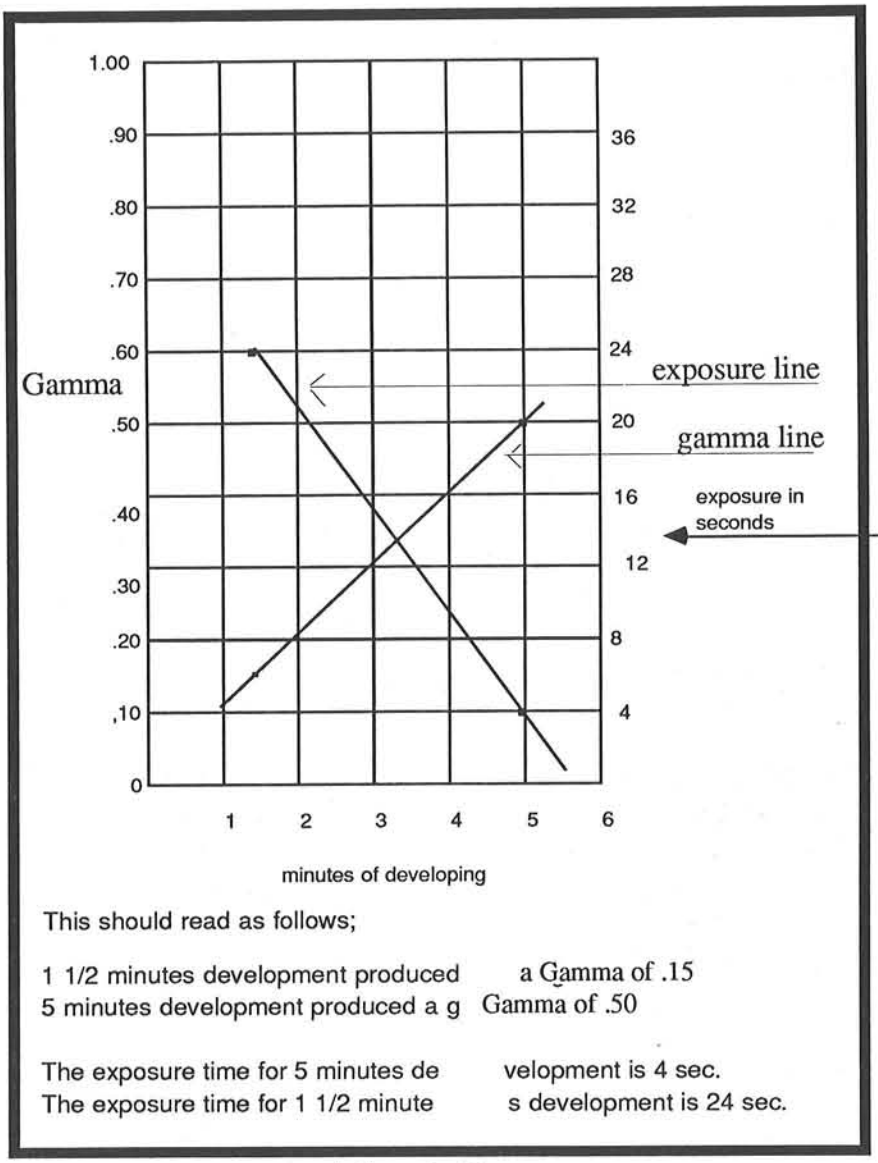
Now that you know the proper development time, again , follow that line up until it meets the exposure line. Then follow that line to the right until it meets the exposures. You can now proceed and make a mask that will fit the range and density requirements for that particular transparency.

The simplicity of this system would actually allow you to visit a foreign country and if the need should ever arise, you would be able to use a strange film and developer and be able to make masks that would fit the occasion.

Incidentally, you will need a chart of this kind for every color filter you plan to use.

And just a word for some of you who have plotted curves before. In the actual plotting of curves, the resultant gamma curve should really have a curve shape to it. That's why many sheets are exposed and plotted to find the exact curve shape. But since we are primarily concerned with just the low end of the scale, the slight change that may exist will be unimportant.

Remember, the 3 step scale represents the straight line portion of the whole curve.



A Sample Chart

A word about processing

Processing of any kind of film should be academic. We have been through a revolution in the kinds of processing equipment that is available, however, if you only have small quantities of material to process, you shouldn't have to have massive and expensive equipment in your lab

for just a simple chore.
I have written about the fact that the Jobo processor is one of my favorites because of the variety of films and papers that I can utilize with this machine.
The Imagemaker is also quite high on my list of machines that take the headaches out of a mundane chore like processing. There are even more machines coming on the market for processing different kinds of prints. The Fujimoto CP 30 is capable of processing C prints, B&W prints and Cibachrome. Durst has one as well, and so do quite a few others. These machines are table-top systems and require little plumbing, if any. In other words, the manufacturers have discovered the small lab. There are thousands of us out there.

A new revolutionary idea for processing

One of the newest items that has come to me, via a student, is the fact that Zone V1 labs in Vermont, has a new compensating timer with a built in thermometer that will allow for time changes based on temperature of the chemistry. If you need 3 minutes development at 68 degrees and your temperature creeps up to 74 degrees and you have no ice, this compensating timer will still click off the proper time.
I have ordered one of these timers and will give it a thorough test and report on its ability to do just what the manufacturer claims that it will.
If this unit works as promised, you will be able to forget about ice and heaters and work with room temperatures and still get the right result. Look for a thorough report in my next issue.

POSSIBILITIES OF USING A MINOLTA ENLARGER HEAD WHEN MAKING MASKS AND SEPARATION NEGATIVES.

The color head is actually three pulsed xenon light sources in one unit.
There is no reason why the enlarger couldn't be used in any stage in the making of separations. The image could be enlarged and the masks made to the enlarged size and then the negatives could be exposed through the masks, or the transparency could be masked by contact, then placed in the enlarger to make the final negatives.
The enlarger could be also be used as a light source, even though the light source may too weak. only and all masks and negatives could be made by contact. Either procedure would work without any problems.

Each color in the unit can be used separately so that once a color balance is derived by testing each individually, a set of exposures can be made in balance with much accuracy, unless the material or chemistry is changed.

The negative carrier would have to be modified (probably by Condit Mfg.) in order for pin systems to be used properly.

Are the filters as accurate as compared to Kodak's separation filters, such as the Red 29, the Green 61 and the Blue, 47 B. If they are less sharp cutting than Kodak's, then it is a losing game.

I'll let you know.

SAVING OVEREXPOSED TRANSPARENCIES

There are times when your transparency is just too light. I don't mean washed out, but on the verge of being too light. There is one way to help save the shot, and that is to make a slightly diffused duplicate transparency from the original by contact and after

processing, place it back in register over the original, and you will find that the density, contrast, and color saturation will have been improved. Make your finished product from this sandwich.

MAKING DUPES USING SEPARATION TECHNIQUES

If you make a set of separation negatives which includes all of the necessary principal masks and highlight masks, and these negatives are made to fit the range of the dupe material you intend to use, a set of positives could be made and which would then be exposed individually through the separation filters and the results could be outstanding. This is a long way to go just to make a dupe transparency. But there could be good reasons for using this technique.
Suppose the transparency was a real prize winner and you wanted to preserve this photograph forever, how else could you possibly achieve the
same long lasting results? The dyes in the transparency do have a limited life, but the silver images in a sheet of film should last indefinitely thereby assuring new dupe transparencies at any time in the future with the same degree of accuracy as in the very first dupe. The accuracy achieved in making a dupe this way is outstanding. All the controls that were reserved for the printing process could be employed in making this dupe transparency. Individual contrasts could be altered as well as the color balance. Even local areas that need special attention could be improved.

RECOGNIZING EDGE FLARE AND HOW TO CORRECT FOR IT.

Edge flare is noticable when you see a picture of a light subject (like a white hat) against a darker background (like a blue sky). If you look closely you will notice a dark rim around the light object. This is edge flare.The smaller the original transparency, and the system used in making the separation negatives, the more this problem occurs.

Here is what causes the problem.

The film conventionally used for making the principal mask is Kodak's Pan Masking Film. This material is made to be soft and slighly flared. The reason the film is made this way is interesting. In the early days of color printing it was easier to register the mask back to the transparency because it was diffused. One of the interesting by-products of this soft diffused material was the fact that it improved the illusion of sharpness in the final print, because the fine details in the shot were not masked as tightly as the large areas and even though the overall contrast was reduced, the fine detail stayed almost intact as far as the contrast was concerned,and the image appeared sharper.

But the diffusion of the masking material is what causes edge flare. The white hat will flare automatically when exposed. It is a very light area and the flare is to be expected. This dark silver flare is converted to lighter silver when a separation negative is made. And that again converts to a darker edge when printed.

There are two ways to get rid of this effect.

1. Make enlarged negatives by first making enlarged masks and printing through them to make the final negatives. The edge effect is still there, but the size of the image is much larger while the size of the flare is the still about the same size as it was contact.

2. Use a different film for making the masks.
There is no law which states that you must use Pan Masking film, so why not try something else. I have used Super XX, Separation 1 and even Technical Pan Film. They all work and reduce the flare to almost nothing.
You had better have the finest equipment for registration because it will be difficult (if not impossible) to register by eye.
The trick here is to find the proper dilution of the developer used to process the masks. Make a time gamma chart of your own that you know will work and repeat accurately.
.I have experienced that if I diluted my normal mask strength developer with 100% more water, I almost matched my developing times on my normal system.

AVERAGE DENSITY EXPLAINED.

What do I mean by average density? Well it really is quite simple to explain. All transparencies have different levels of density. Some are dark and some are light. Even when they look good to the eye they still may have different levels of density.

The level of density in any transparency is called the **"average density".**

For instance:
If you make a negative by trial and error from a masked transparency and determine that a **ten second** exposure through a red (29) filter gives you good results (by good results I mean that the major portion of the negative fits on the straight line portion of the negative material) then all that is necessary to do is to read the highlights and shadows of this masked transparency and find the proper numbers, as follows:

shadow.....2.75
highlight.....75

add these two readings together = 3.50
divide this answer by two and get.....**1.75.**

This is the **average density** of that particular transparency. **1.75**

Any time you find another transparency with the **same average density** then the exposure would also be **ten seconds.**
If the average density is different than 1.75, use your slide rule or scientific calculator to find the difference in exposure.

The main reason for all of this calculation is so that the **MAIN PORTION OF THE PICTURE FALLS ON THE STRAIGHT LINE PORTION OF THE NEGATIVE MATERIAL.**

If your negative neglects to have at least a .40 reading in the shadow portion then your shadows will not show much detail.
On the other hand , if your negative highlight area goes beyond the 1.65 or 1.70 reading then you may be plugging up all the highlight details.
If we take this one step further and try to find the proper exposure for lopsided transparencies then use this formula.

Using the same figures as in the above example:
Shadow.....2.75
Highlight.....75
Even though these two numbers were used to provide the average density, they also provided the right numbers for extreme transparencies.
An example:
If your transparency is of a white shirt against a white background then just use the highlight reading. If it reads .75 then the exposure will be ten seconds. If it doesn"t read .75, then you must use some math to figure it out.

If your transparency is of a black man in a dark cave then use the shadow reading. 2.75
The exposure is still **ten seconds**
Its that simple. If the readings are the same use the same numbers. If they are not, **use logarithm and work it out.**

Question and answers

I have received some questions from my subscribers. I will answer them and hope they might answer some of your questions as well.

Question:
How many Dye Transfer prints can be made from one set of matrices?

Answer:
I don't really know the final answer, but back in 1949, I made a set of separation negative from a color transparency shot by Yoesef Karsh of Pope Pius. We made a good set of mats from a retouched set of negatives. But he didn't like the fact that he looked too young. We threw those mats out, washed the retouching off the Negatives and made new mats. In the meantime. we threw the first set of mats out into the garbage pail. When he saw the new print, he said, "lets use the first set".
I went out to the sidewalk, removed the mats from the pail, washed them and then ran over 800 prints from them. And the only reason we stopped was because that's all he wanted. Fortunately, they weren't scratched.
This was before we knew that we could harden matrices. Now that we know how to harden matrices, you could probably run thousands.

Question:
Is it possible to make a soft hold out mask, then reverse it to make a soft burn in mask and make it work?

Answer:
No. You cannot possibly get the two edges to fit properly. If you want a soft edge, it's better to place spacers or diffusion sheets between your masks (friskets) and the negative or transparency.

Question:
Is a point source for an enlarger really that much sharper?

Answer:
And How. The light is really a pin point. You must use a condenser enlarger and an oil carrier to really utilize its potential. The light will be columnated through the condensers and will cause real edge sharpness. The lens must be used wide open or else you will get refraction. The main reason for using the oil is to eliminate the refraction of the glass carrier and to eliminate any small abrasions and scratches that all transparencies have. This will enable you to use a condenser enlarger and be as sharp as possible. The oil is really not an oil, but rather a liquid that has the same or similar properties that exist in glass. This is called a refraction index. If the "oil" that you use has the same refraction index, or very close, then the chances are that you will be sharp from corner to corner.
I discovered a silicon fluid used for electrical condensers., made by Dow Corning. Its number is 200 and its viscosity is 100. This fluid is extremely clean and is inert. It will not harm your transparencies.
Some New York Labs use a liquid used by dry cleaners call Perchloric acid or as it's commonly called "perc". It is highly toxic, but is used sparingly. The main advantage is that you can just hang up the transparency when you are through and it will dry clean in seconds. The silicon system requires cleaning, but that is a simple chore. I prefer the health safety by using silicon.

Other oils work fine but require lots of cleaning when you are finished and it becomes tedious.

A view about enlargers

About enlarger sharpness. I have made professional prints since 1946. I have used all kinds of enlargers. The smoothest one I ever used was an old 8x10 Saltzman with a Cooper Hewitt light source. The light source was very even and the enlarger was easy to manipulate. The prints had a certain smoothness about them and the clients were thrilled with the results. The lenses that were used in my early days were not as fine as those available today, however, the results were great.
But we now face a different situation. Today we are talking more about color than black & white. The large diffusion enlargers with dichroic light sources are equally good, but most photographers are using smaller formats and there is where the difference is.
If you are shooting either 2 1/4 or 35mm, the chances are that you will be making prints up to 20x24". Have you ever made a print with a diffusion system and compared it to a print made with a condenser system? I'm pretty sure that you will admit that there is more edge sharpness or accutance using a condenser than a diffusion enlarger.
Most, if not all, of the professional dye transfer houses in the country are making enlarged separation negatives from 35mm slides using a pinpoint light source and an oil carrier and condensers. The detail and sharpness will astound you.
One of my clients was "Olga". A company that makes ladies lingerie. I was perfectly content making enlarged negatives using a condenser enlarger and oil carriers because I was able to get very smooth and, what I thought was good detail, until I saw a print made by Evans Lab in New York City. I was shocked and amazed that there was so much detail that I was missing. The picture was one of a lady tugging on a pair of silk stockings. The weave was almost etched with detail, and yet the final result was smooth. I made sure that I found out exactly what was being used and I was also able to get the same effect.
From then on, I made all of my separation negative using this system.
However, I used an 8x10 diffusion enlarger to make the final matrices. The results were great.
If anyone disagrees with my conclusions and would like to respond, please do. I welcome constructive criticism.

Lenses

I recently saw a color print made with a diffusion enlarger and with a new Fujinon enlarging lens. It was extremely sharp and full of detail. I tried to make a print of the same original using separations made by contact, and using an old but reliable Schnieder Componon, and the results told me that the new Fujinon lenses are great. I have also used the Apo-El Nikor, 105mm and , it too, is extremely sharp, however, it cots over $1500. I do not pretend to be an expert with lenses, but only report what I have done with some new Apo-Rodagon lenses and was astounded at their sharpness as well. The price for a 90mm was under $300. The detail was incredible.
We all have our favorites.

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