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USING A STEP TABLET IN YOUR PRINTMAKING

INTRODUCTION

Several months ago I purchased a step tablet to do some testing of printing paper. With an investment of less than \$30 and several evenings of making test prints, I found the knowledge gained was invaluable. I did some testing of black and white variable contrast and graded papers and find that I use my test results regularly in my printing of negatives. Using my testing materials I can more easily adjust contrast, exposure times, and change to different papers without having to start each print from “scratch”. I also find I can more accurately previsualize the effect burning and dodging will have on parts of a print. The result is that printing is more fun, I work more efficiently, and do fewer throw away prints as I work towards my “final” print. The testing was one of the most valuable “exercises” I did.

WHERE TO GET A STEP TABLET AND WHAT TO GET

Step tablets generally come in density increments of .15 or .10. A density difference of .30 corresponds to 1 stop of light (a doubling or halving). They usually have numbered “steps” of density corresponding to a range of 10 stops of light. A step tablet with steps of .10, or 1/3 stop will allow you to better analyze and fine tune your results. Stouffer Graphic Arts Equipment, 1801 Commerce Drive, South Bend, IN., 46628 (219) 234-5023 sells uncalibrated step tablets for projection printing of 4 x 5 (TP 4x5 31) or 120 (TP 120 31) which are stepped in .10 or 1/3 stop increments. They also sell a step tablet for 35mm (TP 35 21) which is stepped in .15 or 1/2 stop increments. The cost is less than \$30.

HOW TO MAKE TEST PRINTS WITH THE STEP TABLET - STANDARDIZING THE PROCESS FOR ALL TESTING

It is necessary to standardize your procedures to be able to duplicate your results with any paper, filter, or light source combinations. This is done so you can compare different paper variables and adjust exposure times in your printing.

The first step to setting up your testing procedures is to make a test print by projecting the step tablet onto an 8 x 10 sheet of paper using your lowest contrast polycontrast filter, color head setting (maximum yellow), or paper grade. Projecting the step tablet through the enlarger is preferable to contact printing as projection takes into account the enlarger light characteristics.

35mm users will have either have to use a 2 1/4 inch negative carrier with the TP 120 31 step tablet or use a 35mm negative carrier with the TP 35 21 in which case your steps will be in 1/2 stop increments.

You want to arrive at an exposure combination (height, time and aperture) which yield a step tablet print that has at least 2 blank white steps and at least 2 completely black steps and the middle tones in the middle of the step tablet steps. Take the wet print and dry it in the microwave on low power to be sure your dried test prints will have these boundary steps. You have this when you cannot see any differences between the adjacent steps at the ends of the scale after the paper has dried.

If your initial test doesn't have at least 2 blank white steps and 2 completely black steps, adjust your exposure. Remember that the step tablet is calibrated in .10 changes in density which correspond to 1/3 stop increments. Therefore, increase or decrease the exposure to "slide" the tonal scale along the density steps in 1/3 stops.

Once you have a good initial test print, then you're ready to begin testing your different papers. Make a series of test prints on each paper you regularly use with all the different polycontrast filters from 00 to 5, on all your standard color head filtration settings, or all your paper grades. Process the papers including toning the same way you regularly process your archival prints. Once they are dry, the data written on the back of each print will give you what filter, paper, colorhead setting you have used for that test.

Record the following information in your testing materials notebook and on the back of each test print that you make:

1. The enlarger height (use the scale or measure the distance to the negative stage)
2. The time in seconds of your standard exposure
3. The aperture on your enlarging lens.

Also record the following on the back of each test print in addition to the information above:

- 1. The paper brand, type & surface**
- 2. The polycontrast filter, color head filtration (yellow and/or magenta), or paper grade used**
- 3. The paper developer, concentration and time if you do split development or use different developers.**
- 4. The enlarger light source, if you use several enlargers.**
- 5. The enlarger lens, if you use several lenses.**

I file my prints in a notebook with separators for each paper type. I put the test sheets in increasing contrast order in each section. I now have a notebook with test prints with sections for Ilford MG4FB, Ilford MGFB, Ilford MG4 RC, Kodak Polymax Fine Art G, Forte Polywarmtone, Oriental Seagull Graded & can add other papers as I go along.

FINDING THE CONTRAST RANGES OF VARIABLE CONTRAST PAPERS AND GRADED PAPERS

After your test step tablet prints are dry, find a light that you can view all your current and future prints under. Again standardization is important to achieve comparable results over time. On each test print, count the number of steps that are obviously different from pure black and pure white. Multiply the number of steps by .1 to find the density range of your test print. (35mm step tablet users should multiply the number of steps by .15) Record this information on the test print front and/or back. This will tell you the density range of your particular tested combination. Divide the density range by .30 to obtain the number of “stops” of the range.

Use the following chart to find the paper grade of each tested combination:

<u>DENSITY RANGE</u>	<u>PAPER GRADE</u>
1.40 - 1.70	0
1.16 - 1.39	1
0.94 - 1.15	2
0.80 - 0.93	3
0.65 - 0.79	4
0.50 - 0.64	5
Below 0.49	6

Often, the actual paper grade will not correspond to the polycontrast filter, or even the manufacturer’s paper grade. Your particular light source, whether a

cold light, dichroic head, or condenser head will have an enormous effect on the density range of a particular test print. Thus, it's extremely unlikely you'll get the same density range using the same paper between a condenser light and a cold light. What this means is that if you change your light source, either permanently, or when using another darkroom, your printing contrast and times are likely to require significant changes from your "normal" print contrast and times.

I use a condenser head and get a print range corresponding to grades 1 to grade 6 using Ilford Multigrade IV FB paper. Kodak Polymax Fine Art G has a shorter print density range on my system. Forte Polywarmtone has an even shorter variation with the higher filters showing less change than the other papers. Other people will get completely different results with their systems.

The real benefit of using the step tablet test prints is when you begin to work with the relative values of the tones on the step tablet scale for a particular test print and between different test prints. If you've tested several different papers, you'll probably note that the density range and very likely the tonal placements on the steps of the tablet will be different for the same contrast filter or paper grades. For example, a middle gray might be on step #14 for one paper and #17 for a second paper. Also, note how quickly the tones change from one step to another when you are using higher contrast materials Vs lower contrast materials.

I think in terms of stops of light and fractions of a stop of light when I want to change an exposure on a print. Whether it is making the print lighter or darker, increasing or decreasing print contrast, or localized burning and dodging, thinking in stops makes it very easy to adjust exposures when your printing variables change. When you think in terms of exposure stops, you can examine your tones on a print, compare them to the step tablet test print tones, and see how many stops or fractions of a stop they differ from where you wish the final tonal placement to be on the print. You can also previsualize how the tones on a print will shift with changes in contrast.

To adjust your exposure times by stops or fractions of a stop use the following chart:

<u>FRACTION OF A STOP CHANGE DESIRED IN EXPOSURE TIME</u>	<u>TO INCREASE EXPOSURE MULTIPLY TIME BY</u>	<u>TO DECREASE EXPOSURE MULTIPLY TIME BY</u>
1/6	1.12	.89
1/3	1.25	.79
1/2	1.41	.71
2/3	1.59	.63

5/6	1.78	.56
1	2.00	.50

CHANGING EXPOSURE TIMES ON A PAPER - SHIFTING THE TONAL SCALE ON THE PAPER

When you make a print and want to adjust the exposure, get out the step tablet test print which has the same variables as your current print. (same paper, filtration/filter/grade, etc.) If the print is too light or too dark, you can use the tonal scale on the test print to make an educated guess about how much to change the exposure for the next print. Remember that the test steps are in increments of .10 or 1/3 stop. Find a reference tone on your print, match it to a tone on the test print, and determine how far you want to move it along the tonal scale. Then count the steps, multiply by 1/3 stop for each step and calculate the new exposure.

When you change your exposure on your print you're just taking the step tonal scale and "sliding" it up or down on the step tablet.

CHANGING CONTRAST FILTERS OR PAPER GRADES - EXPANDING AND CONTRACTING THE TONAL SCALE ON THE PAPER

When you want to change the contrast of a print, pull out the step tablet test prints for the original contrast and your new contrast setting. By examining both step tablet tonal scales, you can get an idea how the tonal range will expand or contract with the change in contrast. If you want to hold one important tone constant between the old and new contrast prints, find the matching tone on each step tablet test print. If both tones fall on the same step tablet tone number, no adjustment in exposure is necessary. However, as is more likely, if you merely substitute one scale for another, your important tone may move. You'll need to determine how many steps your tone has moved between the two contrast changes and then by counting in 1/3 stops, adjust your exposure time between prints.

When you change your print contrast, you're expanding or contracting the tonal scale range on the step tablet.

USING THE TEST STRIPS AS A GUIDE TO CHANGES IN PRINT VALUES WHEN BURNING OR DODGING

Burning and dodging are simply localized changes in exposure to parts of a print. By using the step tablet test print for your particular printing session, you can make an educated guess, through previsualization, of how much burning or dodging in stops is needed to change your tone the desired amount. Again, compare the actual tone with the desired tone and calculate the number of steps or fractions of a step difference and then calculate your new exposure time.

When you burn and dodge parts of a print, you're "sliding" the tonal scale up or down the step tablet.

USING THE TEST STRIPS TO CHANGE PRINTING PAPERS - ADJUSTING FOR CONTRAST DIFFERENCES AND SPEED DIFFERENCES BETWEEN PAPERS

When I want to make a new print using a different paper from the original print, I pull out the step tablet test prints for both papers, and find the test print for the new paper with the same density range as the original print test strip for the old paper. This will tell me the filter number, color head settings, or grade I need to use of the new paper to get an equivalent contrast from the old paper. This is very important when working with extremely high or extremely low contrast prints, as different papers will have more variations in minimum and maximum contrast.

The next step is to make the exposure correction for the paper speed difference. Using the old and new step tablet test prints which you selected above, find a reference gray tone on both test prints that are as close as possible. Count the number of steps and/or step fractions the tones differ on the two test prints and adjust your exposure accordingly. Again, think in terms of stops and fractions of stops and use the chart above to adjust your exposure times and aperture of the enlarging lens.

USING THE TEST STRIPS TO CHANGE DEVELOPERS

Keeping all other factors constant, compare the step tablet test strips for two developers to observe changes in the length and location of the tonal scale.

USING THE TEST STRIPS TO CHANGE ENLARGER LIGHT SOURCES

Keeping all other factors constant, compare the test tablet test strips for two enlarger light sources to observe changes in the length & location of the tonal scale. If the differences are significant, you may want to consider making a set of test prints for each enlarger light source.

USING THE TEST STRIPS TO CHECK DIFFERENT EMULSION BATCHES OF THE SAME PAPER

When you get a new batch of printing paper, you can check the contrast range & speed of a new box of paper by making test prints with the highest & lowest contrast settings & comparing them to the original test prints. Note any changes on the box of paper so you can adjust your exposures accordingly.

USING THE TEST STRIPS TO ADJUST FOR PAPER AGING CONTRAST AND SPEED LOSS

As papers age, they generally lose speed and contrast. You can check this by making several test prints and comparing them to your prior prints. Note any changes on the box of paper so you can adjust your exposures accordingly.

SOME FINAL THOUGHTS

The purpose of testing is to learn about your materials and ultimately make better prints. Do the step tablet testing to help gain a better sense of how your papers respond to exposure changes and contrast changes. Remember that these tests are only a tool. Don't make your testing the primary focus of your darkroom work. Use the test sheets as guides when you're unsure of how to further refine a print but remember to keep your eye on the forest and don't get lost in the trees.