

# Better Light ViewFinder™ Repro Curves

Robin D. Myers  
Better Light, Inc.  
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## Introduction

What are the ideal RGB exposure values for the white point, black point and a midtone gray? This is one of the most frequently asked questions from digital photographers. Most often, the answer is an unsatisfying “it depends”. The target values will depend on many factors, including the active tone curve, the exposure, the intended image contrast, the amount of highlight or shadow detail and the photographer’s unique “look”. However, for fine art reproduction, where the intent is to reproduce the original artwork as accurately possible, RGB target values can be specified.

By measuring several commercially available gray scales; the ColorChecker®, ColorChecker® Passport, ColorChecker® SG, or the ColorChecker® DC from X-Rite, the Q-13 and Q-14 Gray Scales from Kodak; with a spectrophotometer and performing some calculations, the Repro curves were created as a tool for successful digital scanning.

These curves were designed for reproduction where the RGB values on a calibrated display will have a **direct correlation to the reflectances of the original items**. If you are going to use the images for publications where details in the highlights or shadows need to be emphasized, or when you want a “certain look”, then you may want to use one of the other curves supplied with the ViewFinder™ software.

Using the Repro curves will assure an accurate reproduction of the full tone scale and minimize the need and importance of making subjective decisions about tonality from the monitor preview. Since the exposure is made objectively by numeric values, the Repro curves can be used with LCD screens in a “by the numbers” reproduction situation, something that is extremely difficult with LCD panels due to the change in color and contrast encountered by the viewer when changing their viewing position.

How you use the Repro curves will depend on whether you are using software that compensates for lighting and lens intensity falloff, or not. Each method is outlined below. Use only the one that conforms to your workflow.

## Using the Repro Curves without Falloff Compensation

Begin by selecting the Repro curve that matches the gamma for your monitor. Note, these curves assume your monitor has been calibrated to either a 1.8 or a 2.2 gamma value (do not judge the quality of the preview image unless you have a calibrated monitor).

1. Position the camera in your copy setup so the size of your color chart is no more than 25% of the image area.
2. Make a prescan of a clean white board (e.g. Foamcore™ ).
3. Activate the ToneZones™ feature in ViewFinder.
4. Adjust the lights until a chart-sized area of the preview is evenly lit to within 2 RGB units, or less. This may require setting up a custom set of zones. The camera may need to be moved back even more from the copyboard to produce an evenly lit, chart-sized area, usually in the middle of the lens. Often the chart-sized area is only 1/4 or less of the image height or width.
5. Place either a ColorChecker, ColorChecker Passport, ColorChecker SG, ColorChecker DC or a Kodak Q-13 (or Q-14) Grayscale in the evenly lit image area.
6. Make a prescan of your color chart. For the highest color accuracy, **do not use the Fast Prescan option**.
7. Using the spot meter tool, select the white patch on the reference.
8. Adjust the exposure using the Line Time, ISO and Neutral values on the Color panel until the spot meter **green**

**channel** values of the white patch match the values in the attached chart. If necessary, change the camera lens aperture and make a new prescan. **Do not change the lights!**

9. Capture an image of your chart at the size recommended for your profiling software. Do not forget to digitally remove any defects in the patches before putting the image through your profiler.

10. Create an ICC profile according to the instructions that came with your profiling software.

11. Reposition the camera for the artwork scan. This will require realigning the camera with your Zig-Align™ or other alignment device.

12. Continue with your regular reproduction workflow.

## Using the Repro Curves with Falloff Compensation

Begin by selecting the Repro curve that matches the gamma for your monitor. Note, these curves assume your monitor has been calibrated to either a 1.8 or a 2.2 gamma value (do not judge the quality of the preview image unless you have a calibrated monitor).

1. Position the camera and lights in your copy setup for the size of the artwork to be photographed.

2. Place either a ColorChecker, ColorChecker SG, ColorChecker DC or a Kodak Q-13 (or Q-14) Grayscale in the evenly lit image area.

3. Make a prescan of your color chart. For the highest color accuracy, **do not use the Fast Prescan option**.

4. Using the spot meter tool, select the white patch on the reference.

5. Adjust the exposure using the Line Time, ISO and Neutral values on the Color panel until the spot meter **green channel** values of the white patch match the values in the attached chart.

6. Capture an image of your chart at the size recommended for your profiling software. Do not forget to digitally remove any defects in the patches before putting the image through your profiler.

7. Use your falloff compensation software to create an evenly toned color chart image. This may require capturing a second image of a white or gray material that covers the image area. Consult your falloff compensation software's manual for the details.

8. Create an ICC profile according to the instructions that came with your profiling software.

9. Continue with your regular reproduction workflow.

## Contrast Adjustment

After the profile is created and applied in ViewFinder, you may find the preview image to be slightly less contrasty than desired. To increase the contrast slightly, use the following procedure.

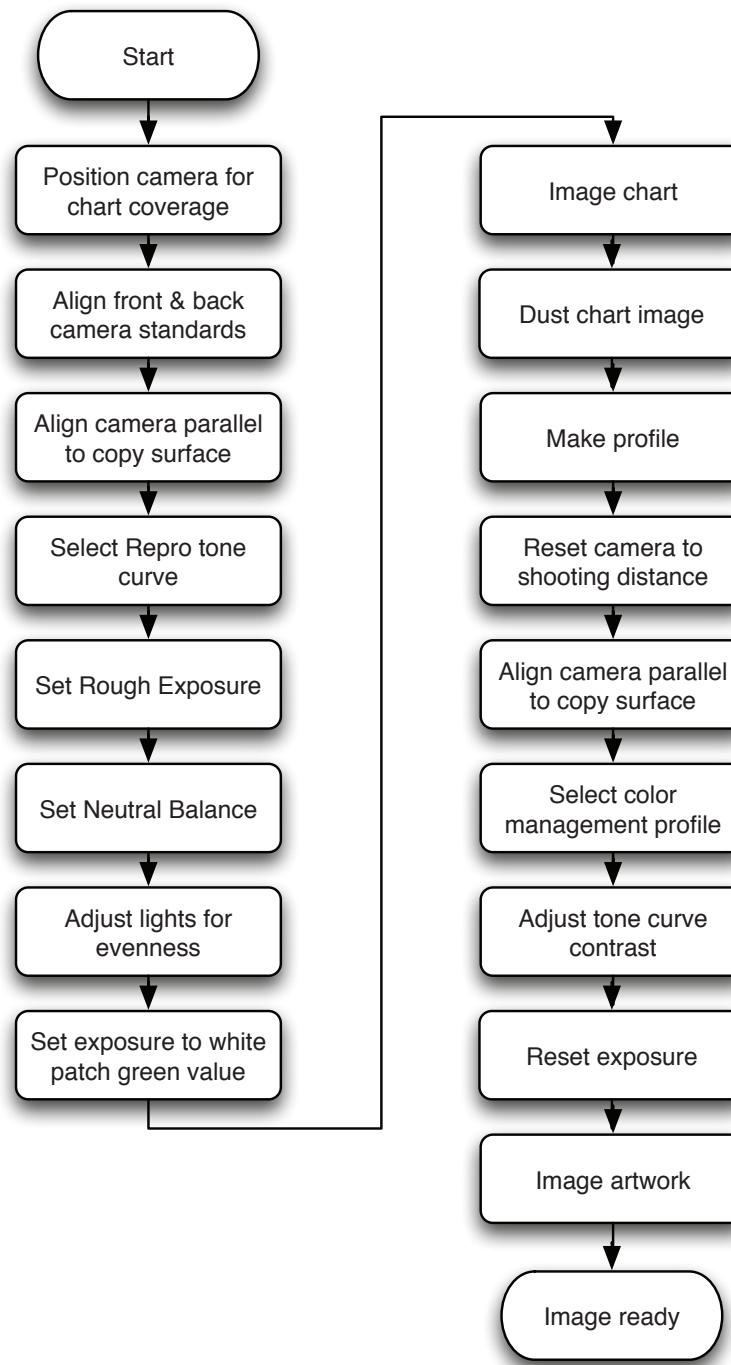
With a prescan image of the color target in the ViewFinder preview, clear the spot meters, then put a spot in the white patch on the color chart. In the Tone panel, click and drag the zero point in the scale at the bottom of the graph until the zero point is at the same point as the white patch (the RGB number on the left side of the tone graph will be the same value as the white patch in attached chart).

Holding down the Option key (Alt key on Windows), click **once** on the Increase Contrast button. This will cause the graph to rotate slightly about the zero point. The effect will be to increase the contrast slightly without burning out any highlight details. Then make a new setting for this curve. It is recommended to name the curve with some indication that this is the modified Repro curve but with one extra click of contrast (e.g. Fred repro+1con).

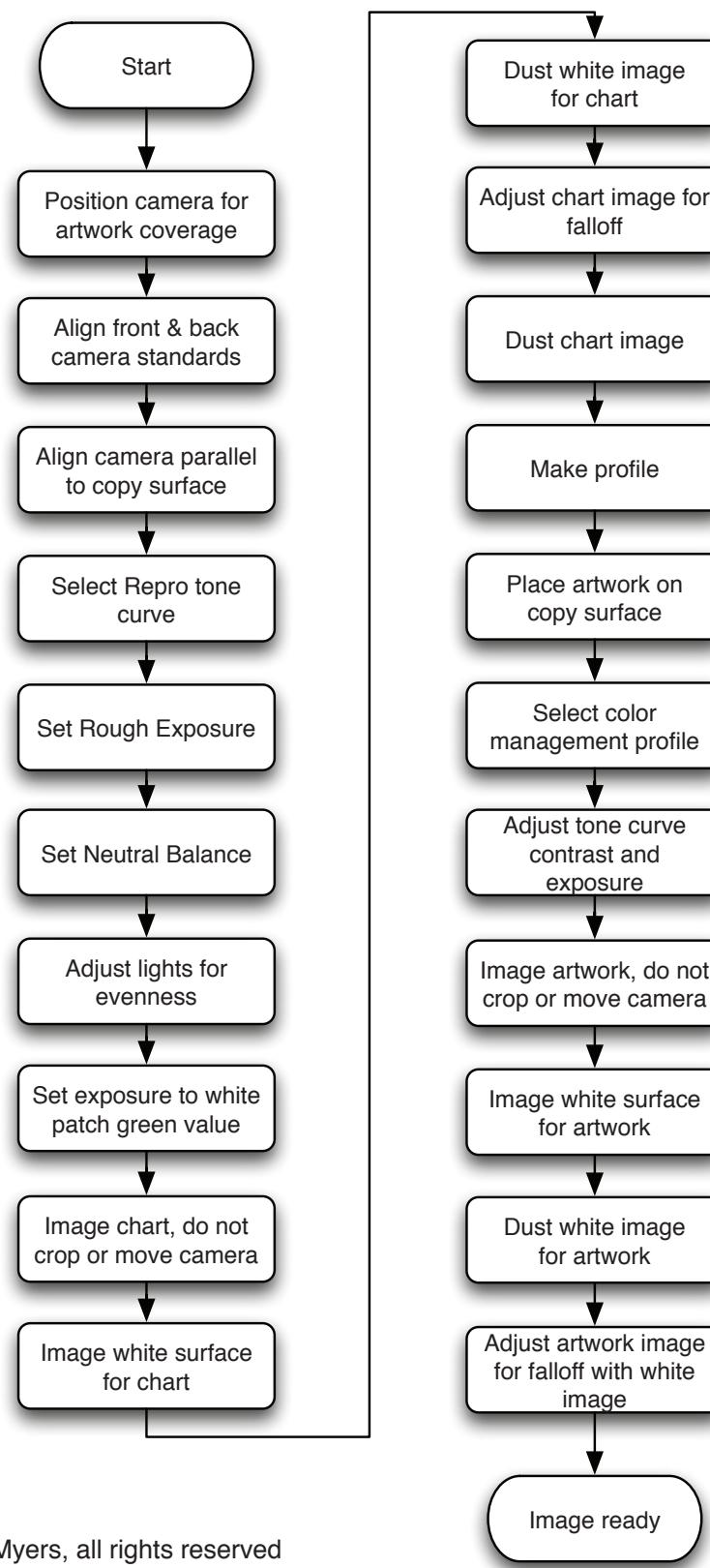
Then hold down the Option key (Alt key on Windows) and **click once again** on the Increase Contrast button. Make a new setting for this curve, indicating that this curve has 2 clicks of contrast (e.g. Fred repro+2con)

To use these modified curves, prescan the artwork with the profile applied, then select either the one-click or the two-click curves to increase the contrast to achieve the desired result. This is a “season to taste” adjustment. It often depends on the artwork as to which curve will be preferred.

# Art Reproduction Workflow Without Falloff Compensation



# Art Reproduction Workflow With Falloff Compensation



## Repro Curve Values

ColorChecker Classic			ColorChecker Passport			ColorChecker SG		
	Repro Curve			Repro Curve			Repro Curve	
	1.8	2.2		1.8	2.2		1.8	2.2
White	241	243	<i>White Balance</i>	190	201	E5/Outer White	243	245
N8	190	201	<i>Photo Enhancement</i>			J6	217	223
N6.5	145	161	Light Clipping 4	241	243	F5	184	195
N5	104	122	Light Clipping 3	215	222	I6	175	187
N3.5	67	85	Light Clipping 2	190	201	K6	157	172
Black	37	53	Light Clipping 1	167	181	G5	140	156
			Dark Clipping 4	51	68	H6	127	144
			Dark Clipping 3	46	63	H5/Outer Gray	100	119
			Dark Clipping 2	42	58	K7	89	108
			Dark Clipping 1	37	53	G6	76	95
			<i>ColorChecker Classic</i>			I5	65	83
			White	241	243	F6	56	73
			N8	190	201	K8	36	52
			N6.5	145	161	J5	30	44
			N5	104	122	E6/Outer Black	20	32
			N3.5	67	85			
			Black	37	53			
ColorChecker DC			Kodak Gray Scale					
	Repro Curve			Repro Curve				
	1.8	2.2		1.8	2.2			
Gloss White	244	246	0 (A)	239	242			
JK67	241	243	1	210	218			
I5	232	236	2	185	196			
Outer White	223	229	3	163	177			
J5	198	208	4	143	159			
K5	175	187	5	126	143			
L5	160	174	6	111	129			
I6	138	154	7 (M)	98	116			
L6	117	135	8	86	105			
Outer Gray	104	122	9	76	94			
I7	97	116	10	67	85			
L7	79	97	11	59	77			
I8	61	80	12	52	69			
J8	46	63	13	45	62			
K8	42	58	14	40	56			
L8/Outer Black	37	53	15	35	50			
Gloss Black	10	18	16 (B)	31	45			
			17	27	41			
			18	24	37			
			19	21	33			