



# VIEWFINDER<sup>TM</sup>

CAMERA CONTROL SOFTWARE  
FOR LARGE FORMAT SCANNING



# HIGH RESOLUTION DIGITAL SCANNING FOR 4X5 VIEW CAMERAS

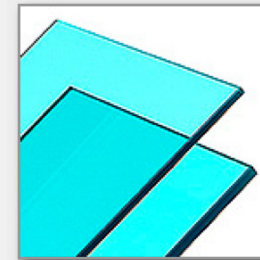


# BEFORE YOU BEGIN...

**1)** Review the users' manual **Quick Start Guide** for instructions on connecting cables, installing ViewFinder™ software and preparing the camera for scanning.

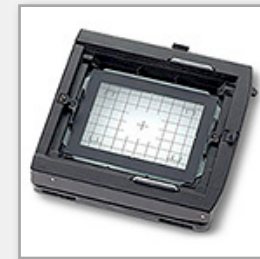
**2)** Refer to the **Users' Manual** while working with this tutorial to lookup detailed instructions on tools and functions of the software.

**3)** Install the appropriate **Infrared Blocking Filter (A)** over your camera lens. Many art scanning photographers prefer the thicker 3mm “tungsten” filter for most situations since it absorbs about ten times more infrared than the daylight filter.



**A**

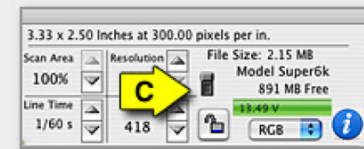
**4)** Attach the **Viewing Overlay (B)** to the camera ground glass to indicate the area available for digital imaging with the Better Light scanning back.



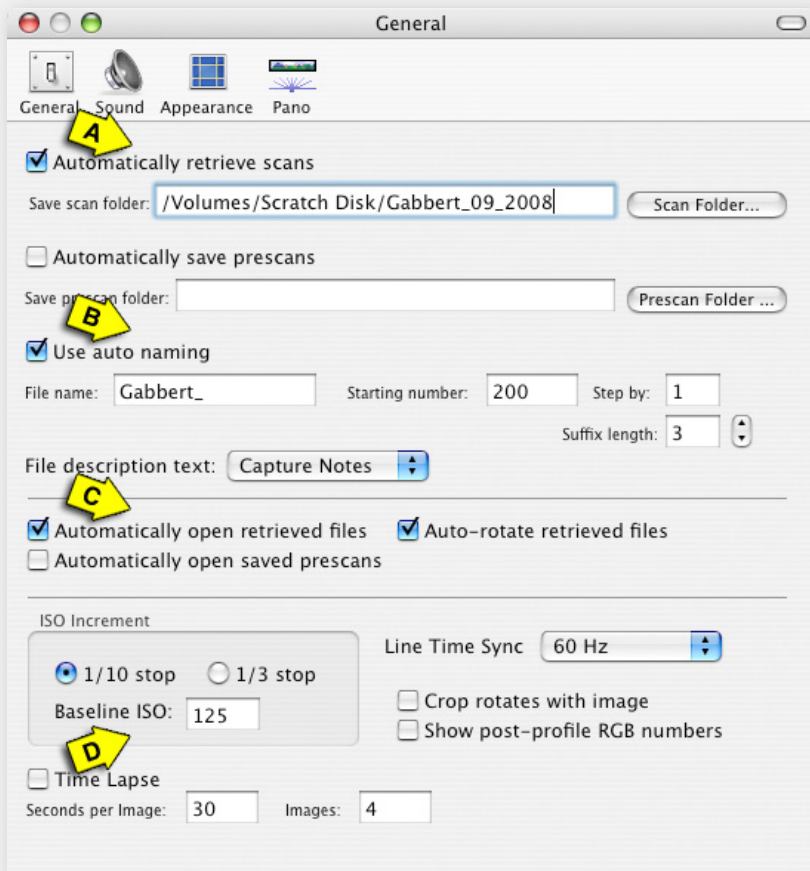
**B**

**5)** Turn on your **lighting, computer and monitor**. The camera **lens shutter** should be opened and left open at all times during scanning work.

**6)** Launch the Better Light **ViewFinder™** software according to the instructions in the manual. Be sure that the camera is located by the software. The camera connection is shown in the upper-right corner of the main window (**C**).



# BASIC PREFERENCES SETTINGS



## RELATED NOTES:

*Automatically Saving Prescans* is helpful for digital cataloging or to have a smaller file created for website or email use. A *Saved Prescan* is an 8-bit 4.2 MB file for 4000, 6000 and Super6K™ models and 3.4 MB on a Super8K™. You can also use COMMAND-S (CONTROL-S Windows) to save an occasional prescan.

**ViewFinder Preferences include some settings for improved workflow that you can customize to your project's needs.** See the instruction manual for information on the other settings that provide user options.

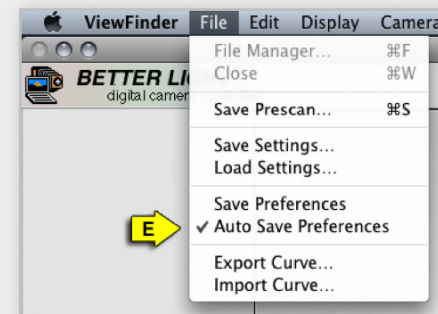
**A)** When the box for *Automatically Retrieve Scans* is checked, after the scan is completed, a DUPLICATE copy of the scan will be saved on your host computer's hard drive in a folder you pick. You can do the same for prescans.

**B)** *Use Auto Naming* provides a consistent title on each image and will add a number to the file name. The *File Name* is editable before you scan each image even if you use auto naming.

**C)** If you are using *Automatically Retrieve Scans*, you might also want the image to continue to open into Photoshop (or a similar program). Check the box for *Automatically Open Retrieved Files*.

**D)** Each camera model has a different *Baseline ISO* value. Be sure you have the proper value set for your model (refer to users' manual). Most typical settings are: Super8K-HS = 125 and Super6K-HS = 200.

**E)** One other precaution...on the top menu bar under FILE, be sure that *Auto Save Preferences* is checked. This will assure that any settings that you modify or customize will be saved when the program is closed.

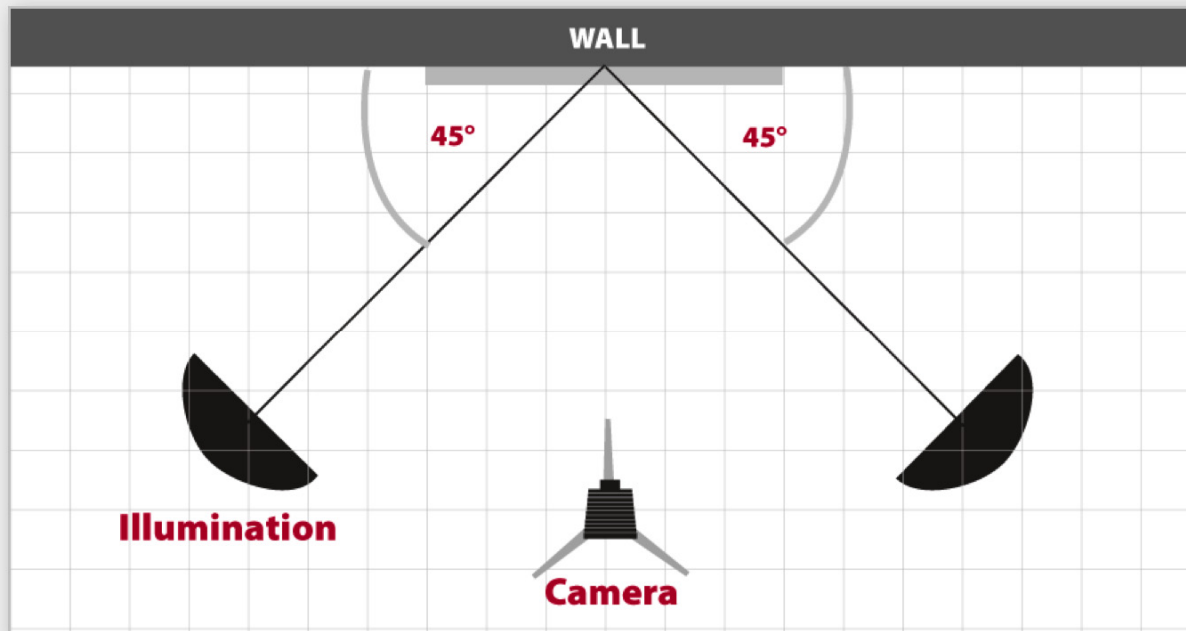






# USING TONE ZONES TO SET LIGHTING POSITIONS

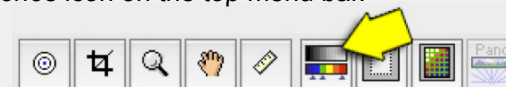
# TONE ZONES TO BALANCE LIGHTING



Position the camera to cover all or the majority of the potential scanning surface on your easel or copyboard. Roughly focus the camera on the copy plane.

Cover the copy surface with a clean, smooth, flat white card, FoamCor®, or opaque paper.

In the ViewFinder software, click on the *Tone Zones* icon on the top menu bar.



The objective is to use the *Tone Zones* tool to help us see where the light is the brightest within the image area and how rapidly it is falling off due to the light source and the lens itself.

The *Tone Zones* tool allows us to set a specific range of RGB values to appear as a solid color. The *Default Setting* could be used, but it is too wide of a range of tones to give us an accurate impression of the lighting pattern. We will create a new setting for evaluating the light coverage on the next page.

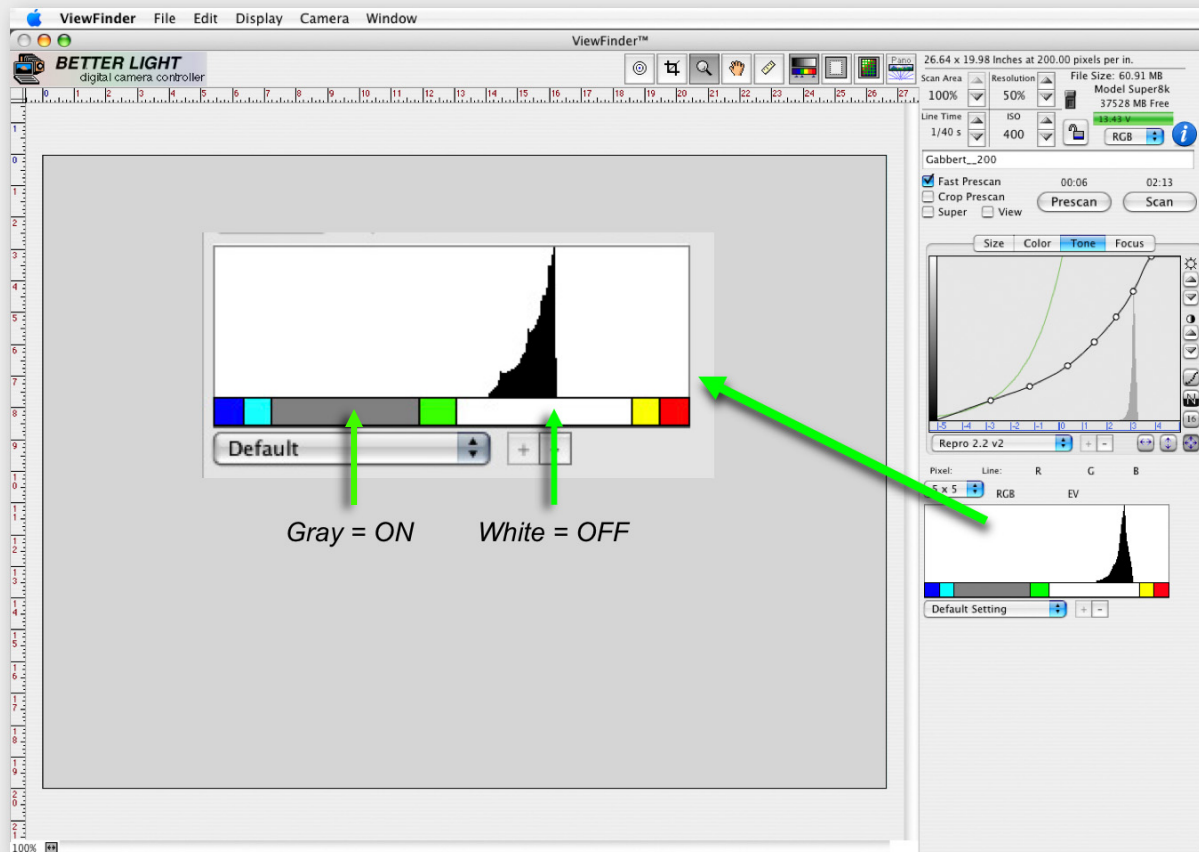
## RELATED NOTES:

The setup of your camera and lighting should be done just as if you are working with film — except, of course, the use of continuous lighting instead of electronic flash.

As a general starting position set your lights on each side of the camera at about a 45-degree angle to the copyboard surface. A starting distance could be 5 to 8 ft. away; or for larger work, 1-1/2 to 2 times the diagonal of your copy area. The center of the lights should be at the height of the center of the artwork.

“Feathering” your lights is an effective way to improve the even illumination of your copy area. Twist the lights slightly toward the opposite side of the copy area (turning toward the camera). This will minimize a “hot spot” in the center of the copy area and increase the brightness on the outer edges.

# TONE ZONES TO BALANCE LIGHTING



Clicking on the horizontal color bar will turn the color *ON* or *OFF*. Gray is the default color for *ON*. White is the default color for *OFF*.

Click on a space in the horizontal bar with the **OPTION** (ALT Windows) key depressed to add a new line **to make a new “zone”**. Click on a line with the **OPTION** (ALT) key depressed to delete a zone.

Click within a zone with the **COMMAND** (CONTROL) key held down **to assign a color** to that division. The zone must be “ON” (gray or color showing) for the color picker to work.

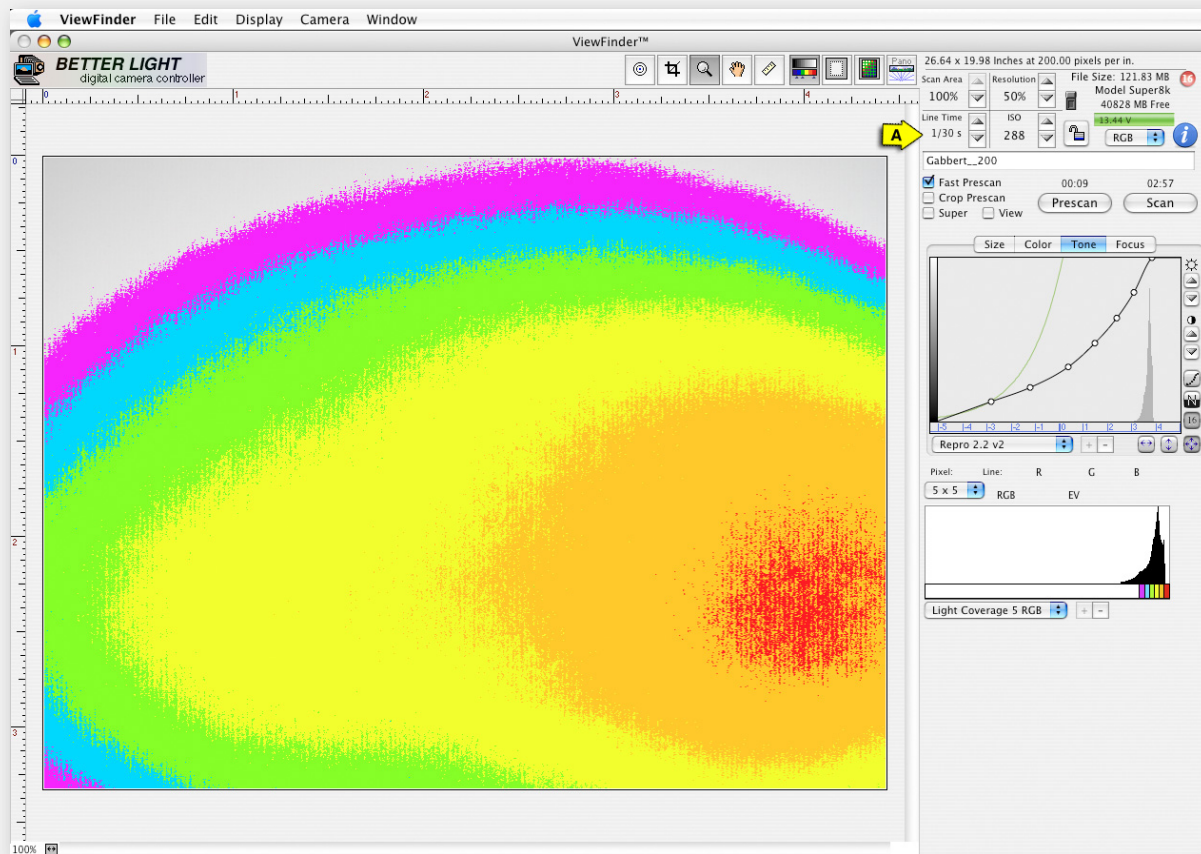
## CREATE A NEW SETTING:

Click and drag on the vertical divider lines between the zones to create a series of five RGB values (use any colors you prefer):

255 — 250	Bright Red
250 — 245	Orange
245 — 240	Yellow
240 — 235	Lt. Green
235 — 230	Lt. Blue
230 — 225	Lavender

Save the new setting with a unique name, such as “Light Coverage 5 RGB, and it will be added to the popup menu.

# TONE ZONES TO BALANCE LIGHTING



## RELATED NOTES:

For critical work, RM Imaging ([www.rmimaging.com](http://www.rmimaging.com)) sells Equalight™, a software program that will create a digital masking algorithm to balance the brightness across your imaging area and correct for any lighting falloff and lens vignetting.

Place the scanning back insert into the back of the camera. Set the lens to f-11 and make a Fast Prescan of the white board. Adjust the brightness of the prescan using the *Line Time* (1/3 f-stop) or *ISO* (1/10 f-stop) adjustments (A) until a number of the colors are showing up to create a pattern of colored rings.

This colored pattern will show you how the light is falling on the copyboard and the amount of falloff caused by the light spread and the lens itself. The objective is to get the pattern centered on the preview screen and be as even as possible.

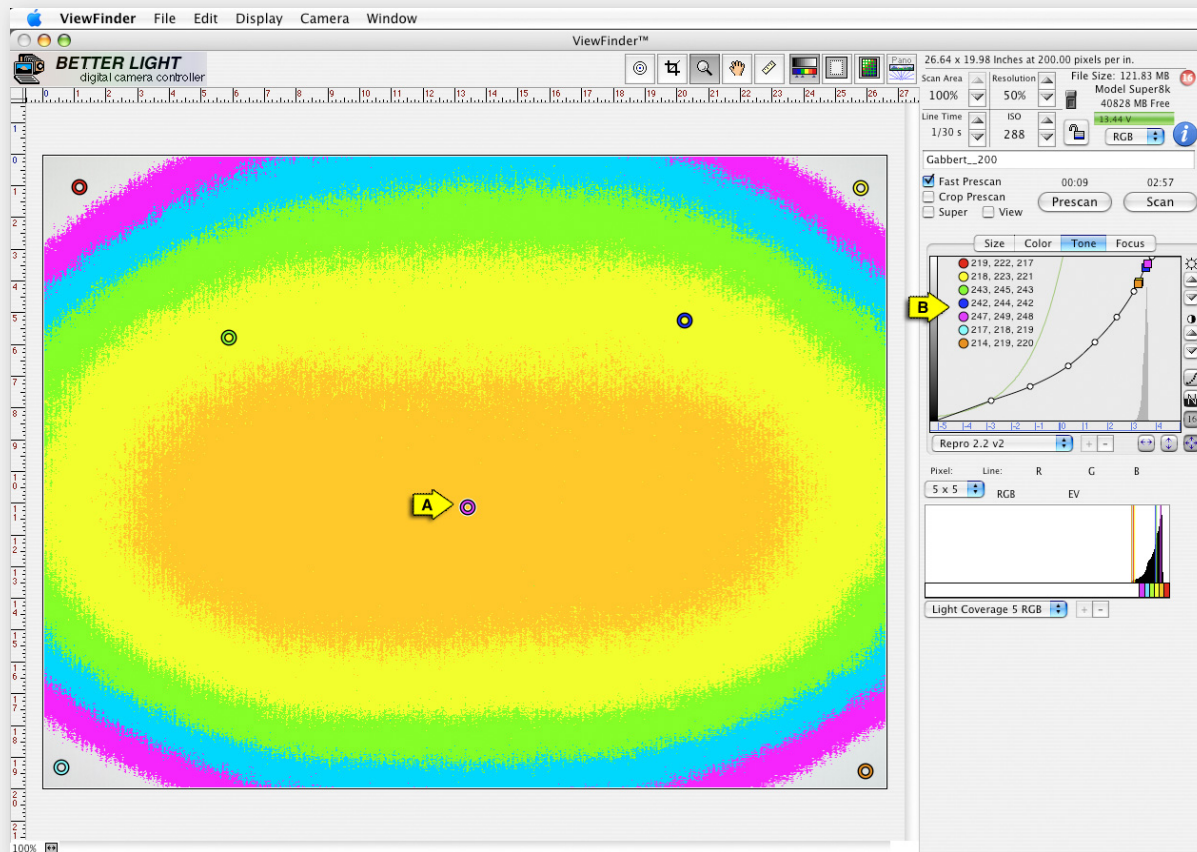
Feather or move your lights in relatively small increments. It is often easier to move one light at a time to see how the pattern changes.

After each movement do a new prescan. Adjust the *Line Time* and *ISO* as needed to maintain a multi-colored pattern. Repeat until you feel you have the light as even as you can get it.

This preview image shows that the light is brightest at the lower right. Both lights may need to be raised up a little higher, and the light on the right should be feathered to the left (toward the camera). The light on the left side may also need to be feathered to the right to help balance out the pattern.



# TONE ZONES TO BALANCE LIGHTING



This preview image shows a more balanced light coverage. The brightest area of the image (orange) is a wide oval shape and the overall pattern is centered in the frame.

Remember, the light pattern will never be “perfect”. There will always be falloff, so the pattern will most likely be oval shaped. Also, by observing how many colors are represented from the outside edge of the frame to the center, you can get an idea of the light falloff in RGB values.

The light pattern will vary primarily side-to-side as the lights are feathered. The type of light fixture and reflector will determine the spread of light top-to-bottom.

This example is using lights with a 16” parabolic reflector, one on each side. This type of fixture is limiting the spread of light top-to-bottom but the side-to-side coverage is quite even when the lights are feathered.

Using four lights (two on each side) will give you more control of the top-to-bottom coverage and allow you to favor the corners of the image to further compensate for the falloff.

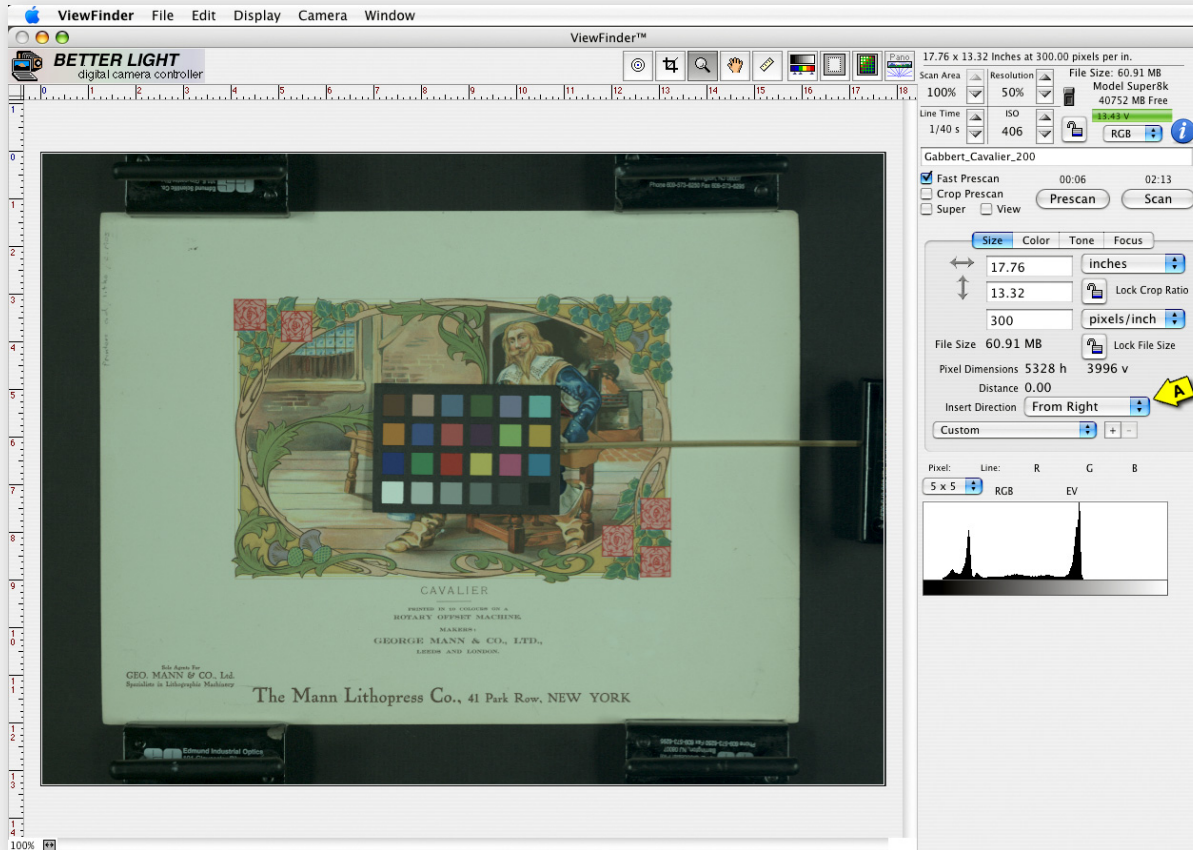
You can also add a number of Spot Meter markers (A) in the corners and center of the Preview to have further information on the variations in brightness. The list of meter values (B) are shown on the *COLOR* and *TONE* panels.





# STEPS FOR SUCCESSFUL SCANNED DIGITAL IMAGES

# STEPS TO A PERFECT SCAN



Position your artwork on the easel or copystand. Adjust the camera to cover the artwork and allow space to include a grayscale such as the X-Rite ColorChecker™, at the edge of the art. Compose the image in the ground glass with the Better Light mask in place to identify the active scanning area. Focus as you normally would and then insert the Better Light scanning insert into the 4x5 ground glass back.

Before proceeding, place the color chart or gray scale in the brightest area of the lighting setup, as determined with the Tone Zone lighting setup.

**For the most accurate exposure readings, the white patch of the ColorChecker should be positioned in the center of the image area, where the light was the brightest, to minimize any chance of overexposure.**

*At this point, it is highly recommended that an alignment procedure such as the Zig-Align® mirror system is used. The **camera body** (lens and film plane) and the **camera-to-subject plane** must be accurately aligned to assure parallelism and obtain optimum sharpness corner-to-corner.*

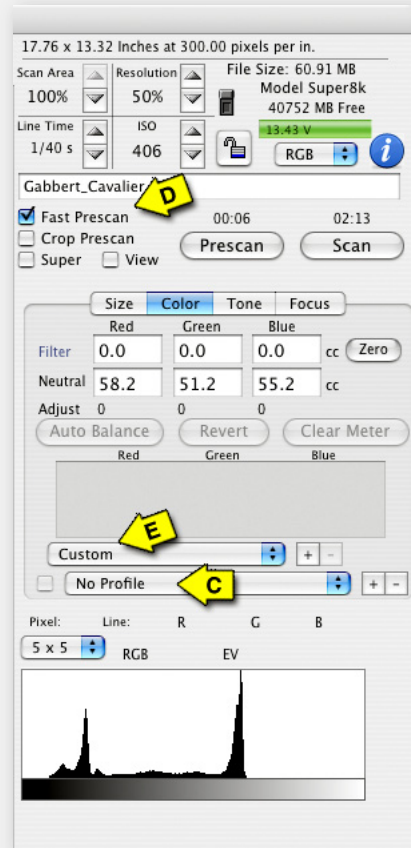
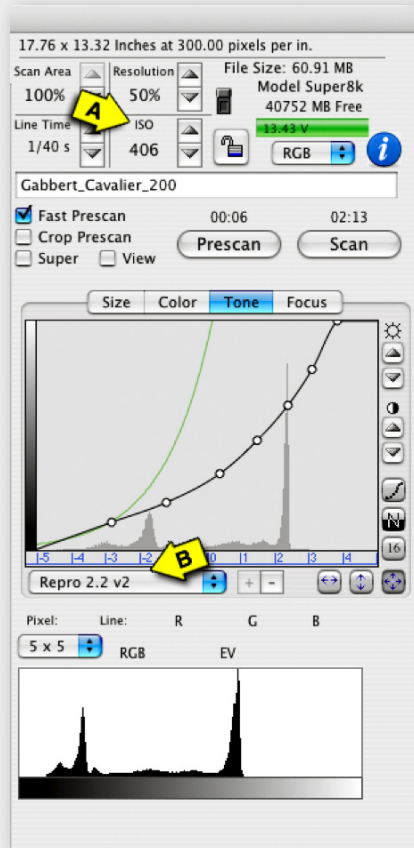
*See Zig-Align procedure steps in a separate tutorial.*

## RELATED NOTES:

A **black surface surrounding your artwork** is recommended to optimize the quality of your scans. A white background will reflect excess light into the camera lens and could cause some loss of saturation, especially in the dark tones.

You can **change the visual orientation of the Preview image** by changing the “Insert Direction” menu option (A) on the SIZE Panel to coordinate with the way you have placed the scanning insert in the camera.

# STEPS TO A PERFECT SCAN



Physically adjust the lens aperture to f-11. In the ViewFinder software, set the LINE TIME for 1/40<sup>th</sup> of a second and set the ISO to as a setting near 400 (A). As you get more familiar with the scan back and the ViewFinder software, you will be able to select Line Time, ISO and Tone Curves that are most appropriate to start with for a new session.

On the TONE panel, select the curve “Repro 2.2 v2” from the menu (B). This will be the starting point to **optimize the tone reproduction** of the scanned subjects. Do NOT move the position of the circle “handles” on the curve unless you intentionally want to modify the tonal reproduction.

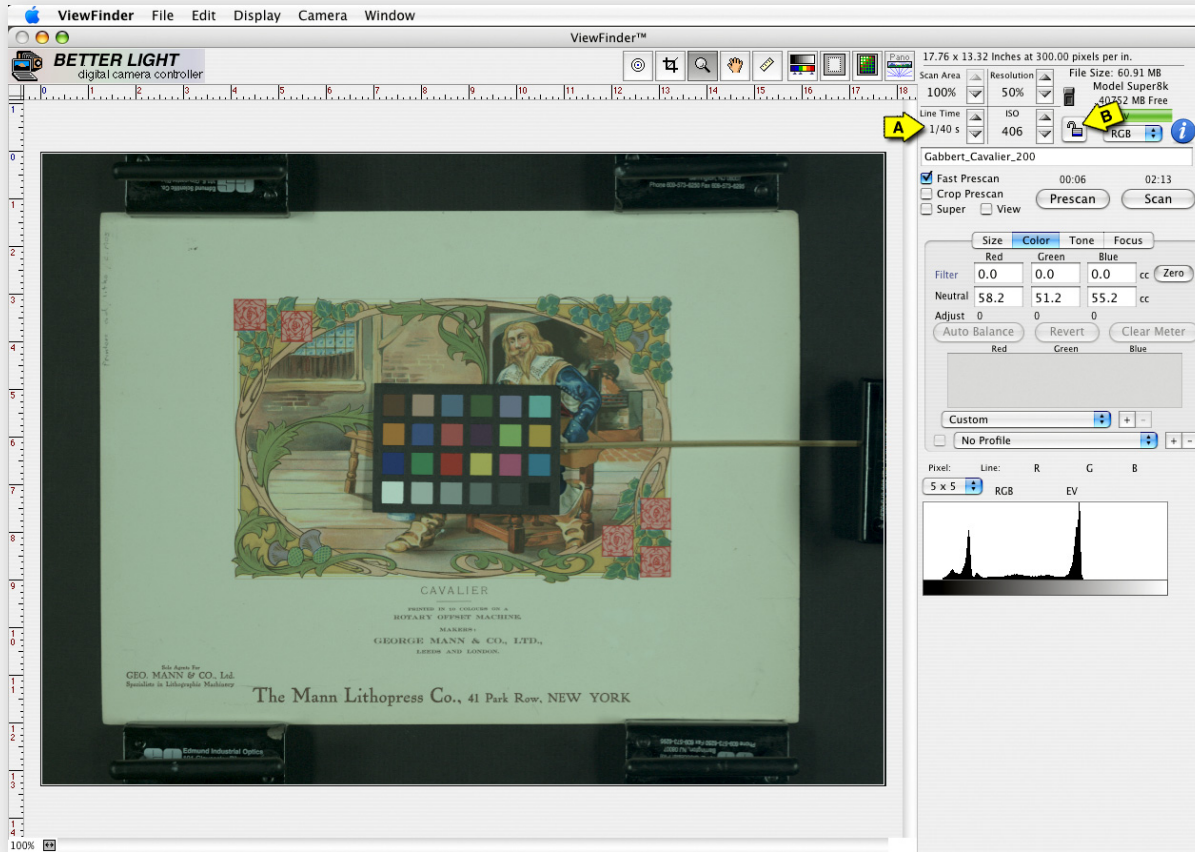
On the COLOR tab panel the Menu bar should be “No Profile” with the box on the left unchecked (C). (See *Color Profile Options* later in this Tutorial).

Check the Fast Prescan button (D) and **click Prescan**. A preview image will appear on the screen. How it looks will vary on what the lighting and settings happen to be. Regardless of how it looks, you can make adjustments to improve it as we proceed.

## RELATED NOTES:

As you work with the ViewFinder software, you may wish to save some settings that reflect the capture conditions that you work with regularly. For example, your copystand with fluorescent lighting or product photography with tungsten lights. When you have a successful setup in exposure, color balance, etc., you can save the settings in the Color panel menu bar (E) as a new setting. This will help you get to a more accurate Preview on the first Prescan of the next session. This is particularly helpful if you use the scan backs in several different environments such as tabletop product work, an art copy setup, or outdoors. As soon as you make any change to the settings, the menu title changes to “custom”.

# STEPS TO A PERFECT SCAN



The first adjustment to be made is a basic VISUAL adjustment to the exposure. **The objective here is to get a pleasing brightness to the image so the color balance measurements can be as accurate as possible.**

You can quickly adjust the lightness or darkness of the Preview using a combination of the *Line Time* and the *ISO* settings.

Click on the Up and Down buttons (**A**) of either of the controls. The **LINE TIME** will make adjustments in **one-third f-stop steps** and the **ISO** is in **one-tenth f-stop increments**...a perfect combination for course and fine tuning. One f-stop change is a 2X change in brightness.

In severe cases of over or under exposure, a change to the subject lighting or camera f-stop may need to be made. Any change to the lights or camera will require a new Prescan.

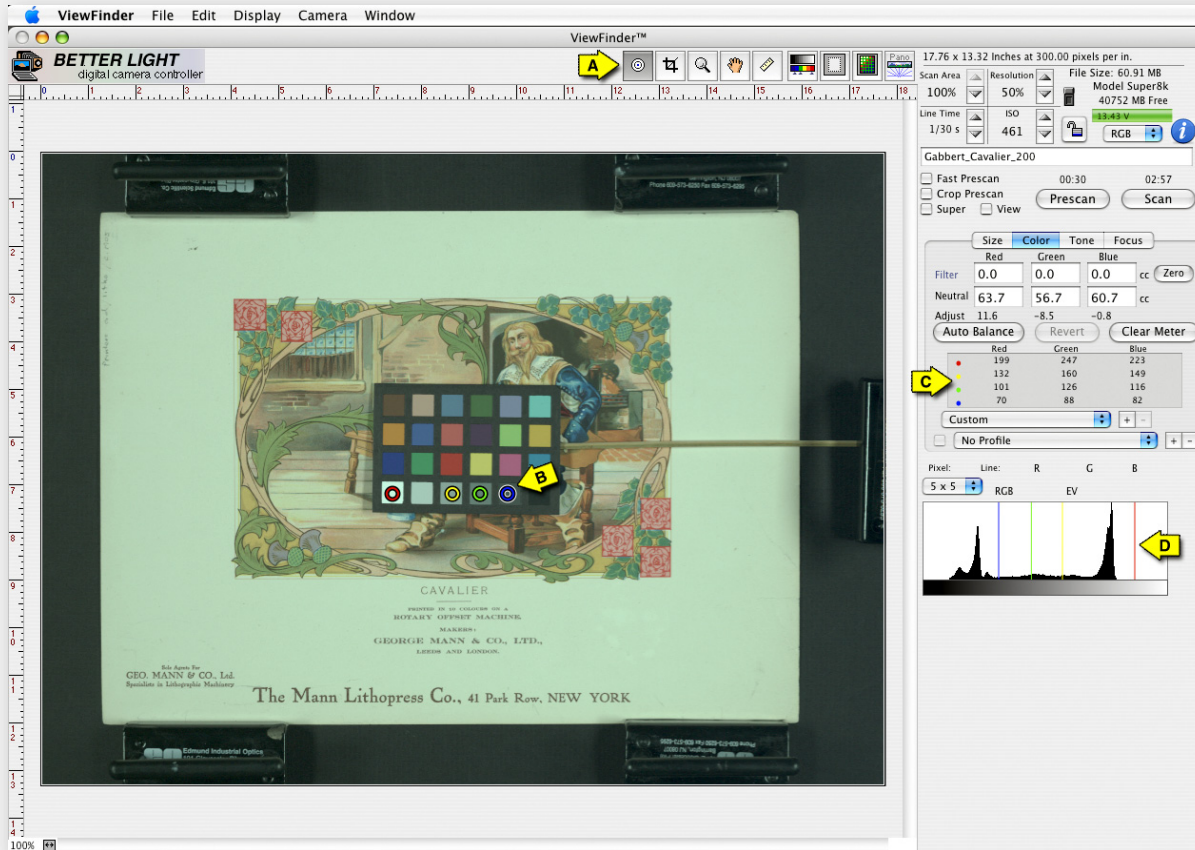
The “*Exposure Lock*” icon (**B**) can be clicked to make changes to the exposure settings without changing the image brightness. Clicking on any of the Up and Down buttons (**A**) will change the *ISO* and *Line Time* values at the same time...as the *Line Time* increases, the *ISO* goes down and vice-versa. Use this lock to pick a shorter *Line Time* for a faster scan or a lower *ISO* for less noise, without altering your exposure.

## RELATED NOTES:

The white patch of the color chart or gray scale should be placed in the brightest area of the lighting setup (see “Light Balancing with Tone Zones”) to assure the most accurate exposure and prevent loss of highlight detail in the middle of the image. This is especially important when creating a custom camera profile.



# STEPS TO A PERFECT SCAN



Uncheck the “Fast Prescan” option and capture a new Prescan to have more accurate data to set exposure and color balance.

Begin by selecting the *SPOT METER Tool* on the top menu bar (A). The mouse cursor will now turn into two concentric circles and allow you to position up to twelve “Sticky” Meter Spots within the Preview area.

Click on several values of the grayscale. Note that the last spot placed (B) will have a white outside circle on it; this spot can be moved with the mouse or quickly removed by hitting the DELETE key. If you click on a different spot, the white circle will move to the new selected spot, which can then be moved or deleted.

The individual values of each of the colored Spots are shown as Red, Green and Blue output data values on the color panel (C).

Color lines, matching the spot colors indicate the location of these tones in the *Histogram* (D). The same RGB numbers are repeated on the Tone Curve display.

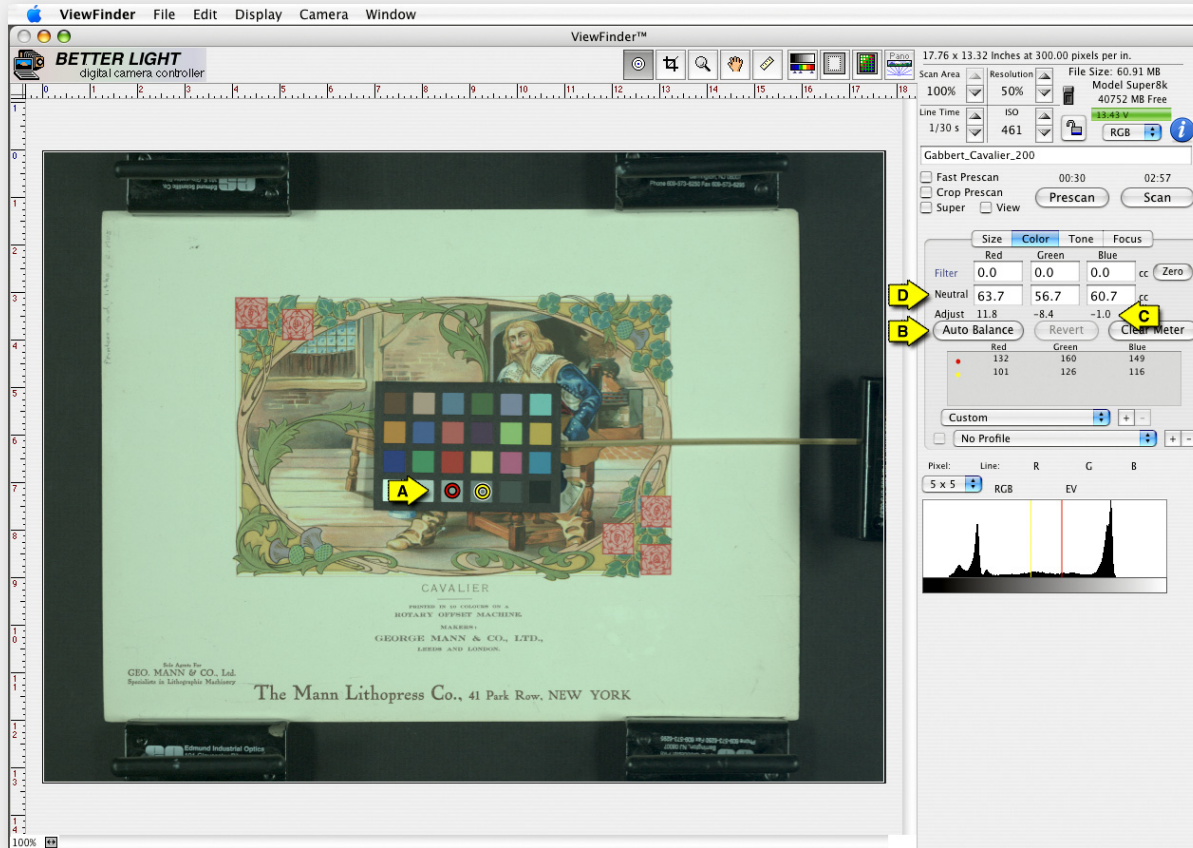
NOTE: *The colors of the Spot Meter circles are only reference colors to identify the spots. They should not be confused as the Red, Green or Blue data values.*

## RELATED NOTES:

The **Fast Prescan** is performed at the highest available sensitivity and shortest line time that will still yield the same color balance and effective exposure. In most cases, this Fast Prescan setting will deliver acceptable results for composition and rough setup. **When the ultimate in color accuracy is required, we recommend that you do a Normal Prescan** (“Fast” box not checked) and then do another Auto Balance. This can be done as a final step prior to scanning if you desire.



# STEPS TO A PERFECT SCAN



For the NEUTRAL COLOR BALANCING step we suggest using the **two middle grays (A)** of the X-Rite ColorChecker™. These provide the most reliable gray tones to assure neutral color. You can also select known neutral tones in the artwork.

**NEUTRALIZING THE COLOR BALANCE** is as easy as pushing the *Auto Balance* button (B). This will **remove any color cast** from the image caused by the color character of the lighting.

The ViewFinder software will determine the correction needed to make each individual spot neutral and then calculate the average correction needed for the Red, Green and Blue channels. This suggested correction is shown in the *Adjust* line of numbers (C) as *CC units* (color correction units).

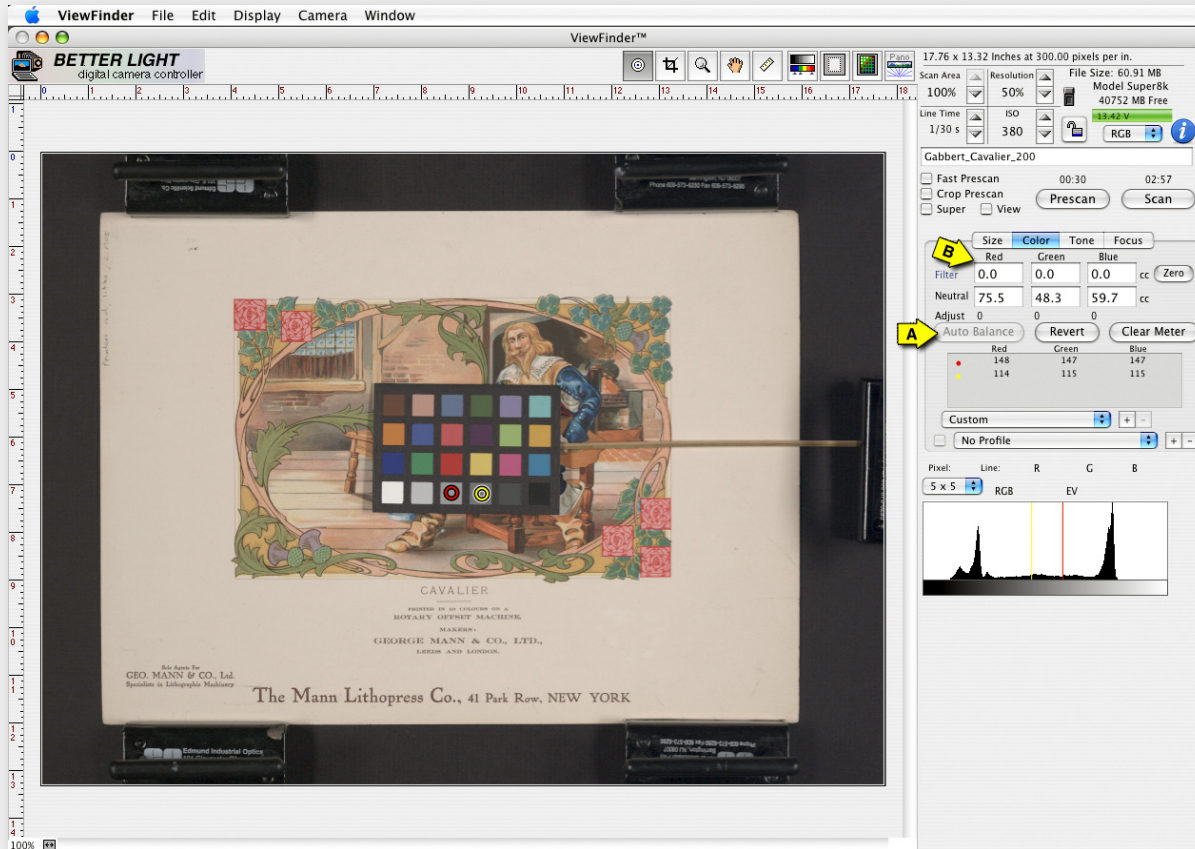
The Neutral numbers (D) shown in the Red, Green and Blue boxes are the heart of the scanning back system. These numbers represent the effective sensitivity of each color channel. No single number can go above 130 CC values.

**To prepare for the Auto Balance**, clear any meter spots, and place new spots on the two middle gray patches on the color chart.

## RELATED NOTES:

For the AUTO COLOR BALANCING you can select one, two, or up to twelve NEUTRAL tones for measurement. An industry standard grayscale is preferred, but other known neutral areas of the image will also work. It is best to use RGB values that falls in the linear portion of the tone curve, typically between 85 and 200. Try to avoid "blacks" and "pure whites" to increase the accuracy of the Auto Balance.

# STEPS TO A PERFECT SCAN



When you have clicked the *Auto Balance* button (A), you will see a change of values in the *Neutral* windows and the *Adjust* line will go to 0.0, indicating that no further color balance adjustment is necessary.

The Neutral Color Balance numbers on the Color Tab Panel represent the relative sensitivity of the Red, Green and Blue channels. These numbers are expressed as CC values (color correction units) as used to designate the color filters used with film. One camera f-stop is equal to 30 CC units.

For critical color balance or brightness (exposure) adjustments you can manually change one or more of the Color Correction (CC) values in the *Neutral* windows, in as little as .1 CC (1/10th) value increments. (30 CC values equal 1 f-stop).

To make a critical density adjustment without shifting color balance, it is necessary to make the SAME value change in EACH of the Red, Green and Blue in the *Neutral* windows. We will use this procedure later when discussing the *Repro* Curves.

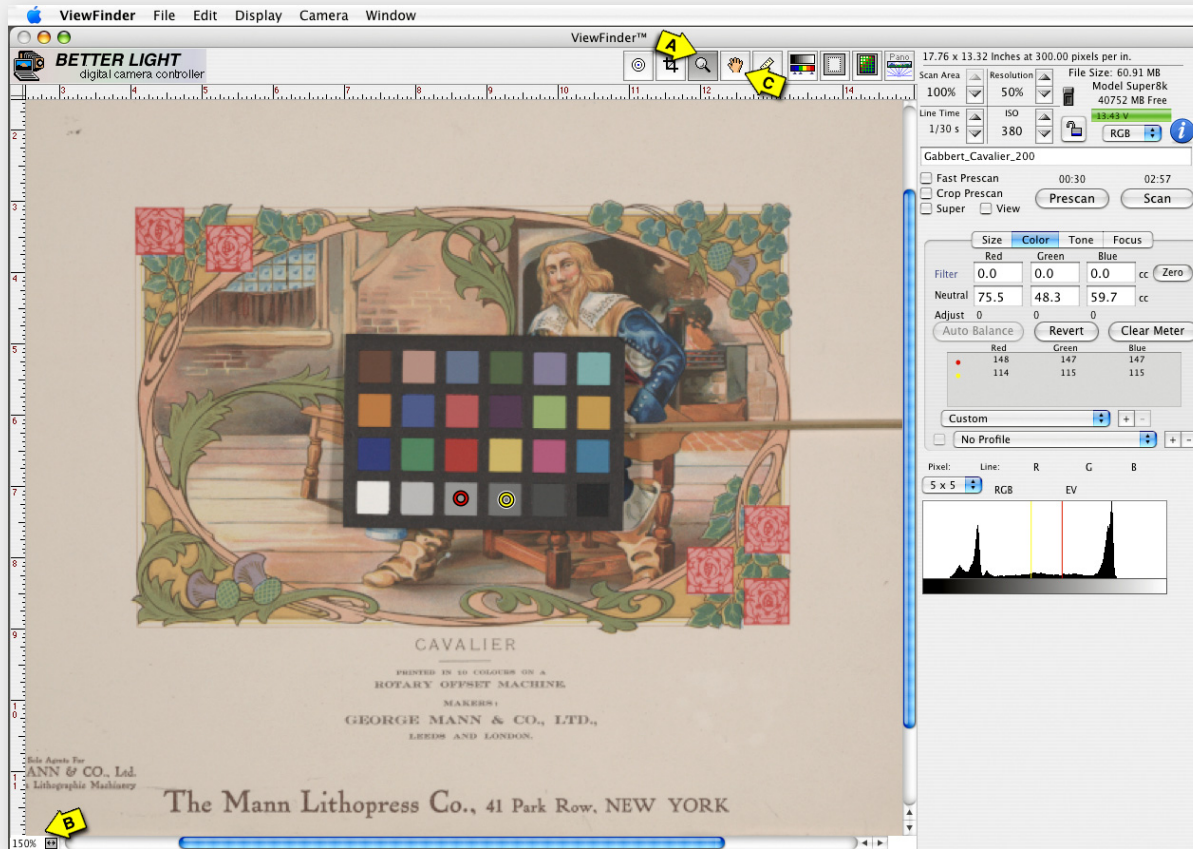
If you wish to introduce a color change without a change to the *Neutral* set of numbers, add the desired CC value in the *Filter* windows (B). This is the same as adding a CC Filter in front of the camera lens and will have no effect on neutral color balancing.

## RELATED NOTES:

The RGB Values used in ViewFinder (red, green, and blue) are the additive primary colors. RGB is the basic additive color model used for color video display, as on a computer monitor, and most typically in digital camera captures and processing applications such as Photoshop. When all three colors are EQUAL the color will be a neutral gray tone. When all three are 0 value the color is BLACK and 255 for all three is pure WHITE -- no detail -- equal to "paper white".



# STEPS TO A PERFECT SCAN



When necessary, such as in the example to the left, it will be helpful to enlarge the Preview to fill the window with the most important parts of the image.

You can do this by with the aid of the *Magnify* tool (A) on the menu bar at the top of the screen. With the icon selected, a mouse click will enlarge the Preview in fixed increments.. Holding the OPTION (ALT) key down will reduce the image with a mouse click.

You can also press the COMMAND (CONTROL) key and the PLUS (+) key to enlarge the image. To reduce the image, press the COMMAND (CONTROL) key with the MINUS (-) key.

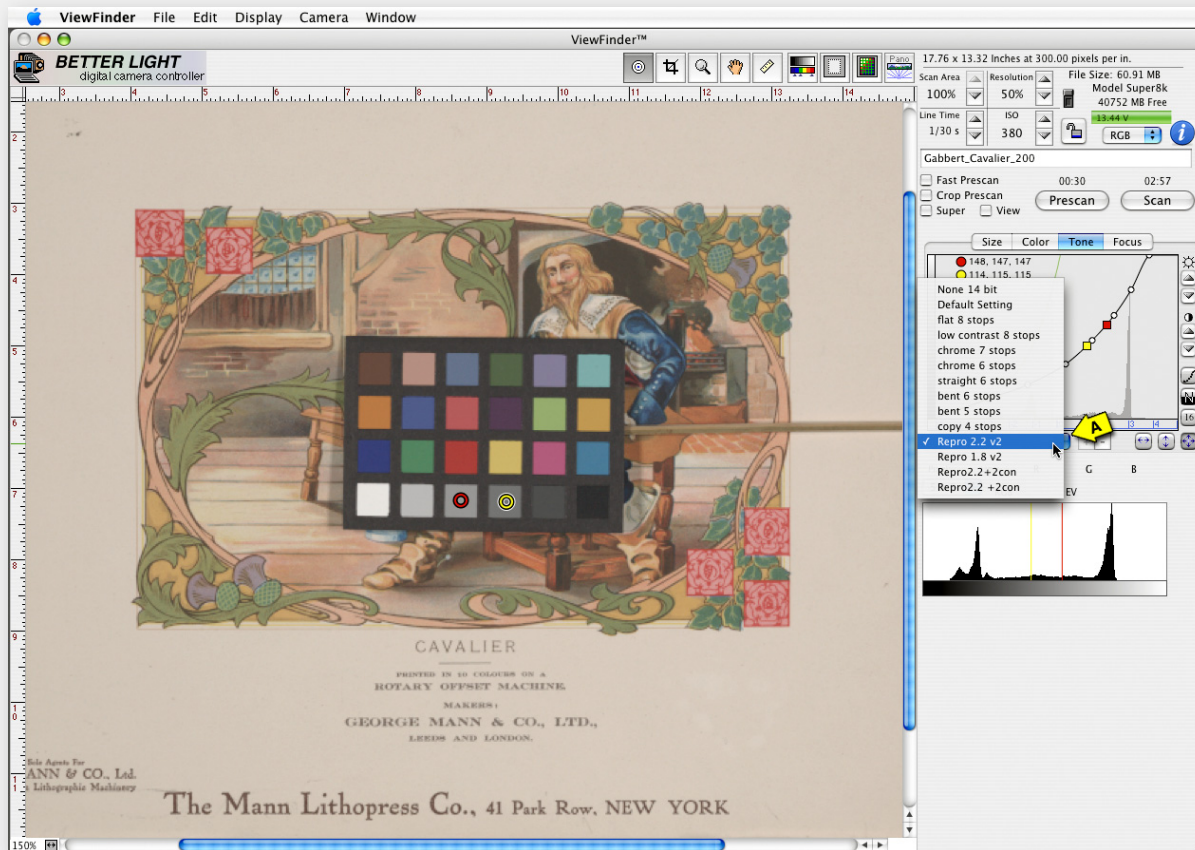
To make a specific size adjustment, type in the desired magnification value in the lower left corner. In this example, we used 150% (B).

Next to the Magnify tool on the menu bar is the *Hand* tool (C). Clicking that button allows you to use the mouse to move the Preview image around in the window as required. Holding the SPACE BAR down will also change the mouse cursor to the *Hand* tool to allow you to click and drag the image within the *Preview Window*.

## RELATED NOTES:

The Preview image is displayed at the highest magnification (up to 100%) that will allow the entire Preview image to be viewed in the window. **The best visual results, however, will be when the image is shown at 100%.** Since the Preview image is a small file size, you will see pixelation at a 200% magnification or more.

# STEPS TO A PERFECT SCAN



Now that the image is larger we can work on refining the exposure and contrast. First, we want to select the desired *Tone Curve* because that will have a significant effect on the brightness and image contrast.

**Click on the *TONE* tab** to show the tone curve window. At the bottom of that window is a *pop-up menu bar* (A). At the beginning of the tutorial, we asked you to set this menu option to “Repro 2.2”. This curve is created to **accurately reproduce the range of tones** of the scanned subjects. Do NOT move the position of the circle “handles” on the curve unless you intentionally want to modify the tonal reproduction.

The ViewFinder software includes a list of preset *Tone Curves*. These curves provide a variation of dynamic range and contrast levels that will be starting points for a wide variety of subject and lighting combinations -- from daylight landscapes to reproduction of watercolor paintings.

When you select a new curve, the ViewFinder software uses the revised settings to display a new Preview that simulates the results that you can expect in the final scan.

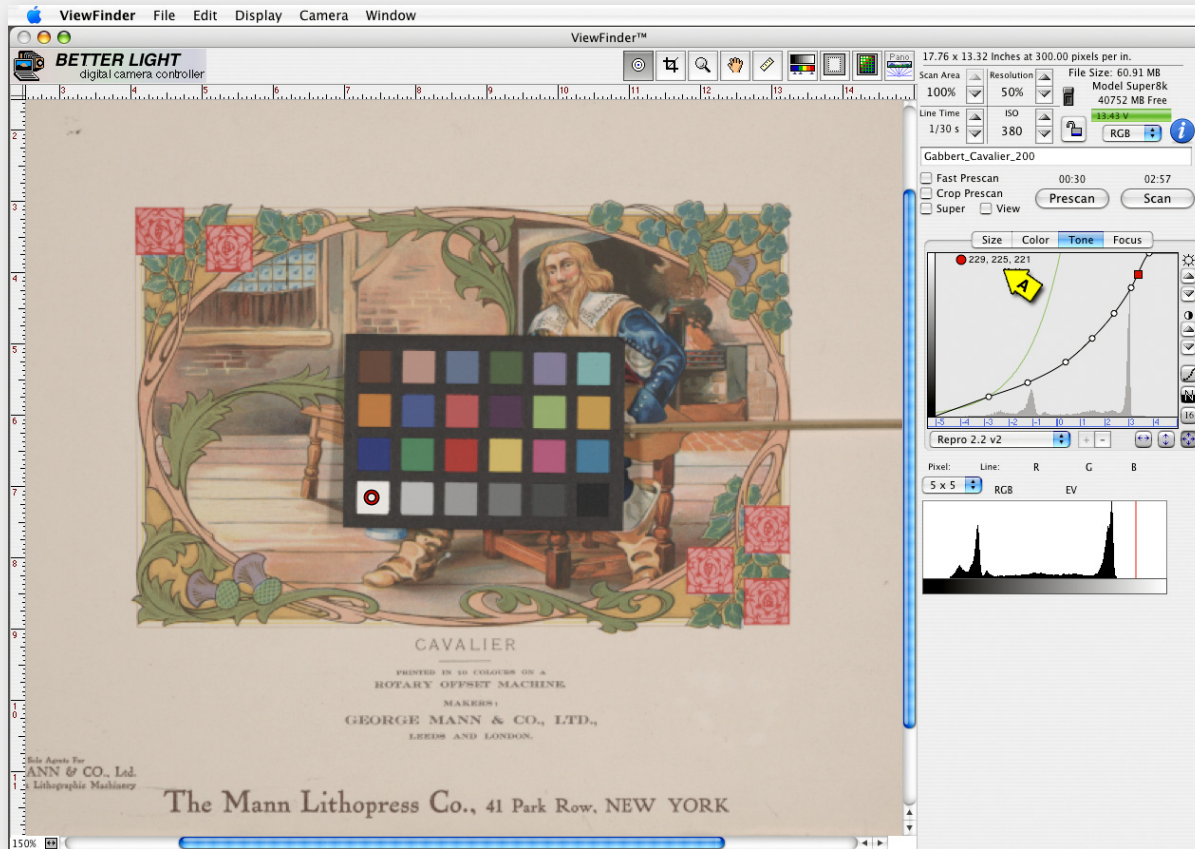
See the section on “Changing Contrast with Tone Curves” for more details on preset Tone Curves and customizing contrast settings for your subject matter and lighting conditions.

## RELATED NOTES:

Better Light Tone Curves are a single line graph that gives you total control of the curve shape and the RGB pixel data to plot the exact translation of light levels to digital output data values. This characteristic curve, with a shoulder, straight line, and toe -- just like a film curve -- gives the user full control of delicate highlight and shadow detail. See examples of the *Tone Curve* variations later in this tutorial.



# STEPS TO A PERFECT SCAN



We have neutralized the image for the light source and have the desired *Tone Curve* selected; now we want to determine the proper exposure.

To keep things simple for now, **remove the Meter Spots** with the *Clear Meter* button on the *Color* tab panel, or use the COMMAND (CONTROL)+M shortcut. Individual spots can be selected with the mouse and removed by clicking the delete key.

**Place a new Meter Spot on the White patch of the color chart.** You can also add one or more spots to known whites in the image to monitor those densities also. As previously mentioned, it is best to have the White patch positioned in the brightest area of the imaging area.

The numbers shown to the right of each colored circle (**B**) represent the RGB values for RED (left), GREEN (center), and BLUE (right). **The number we will watch most frequently is the CENTER Green value.** The green channel holds the most image detail and is therefore the most reliable to base our judgments on.

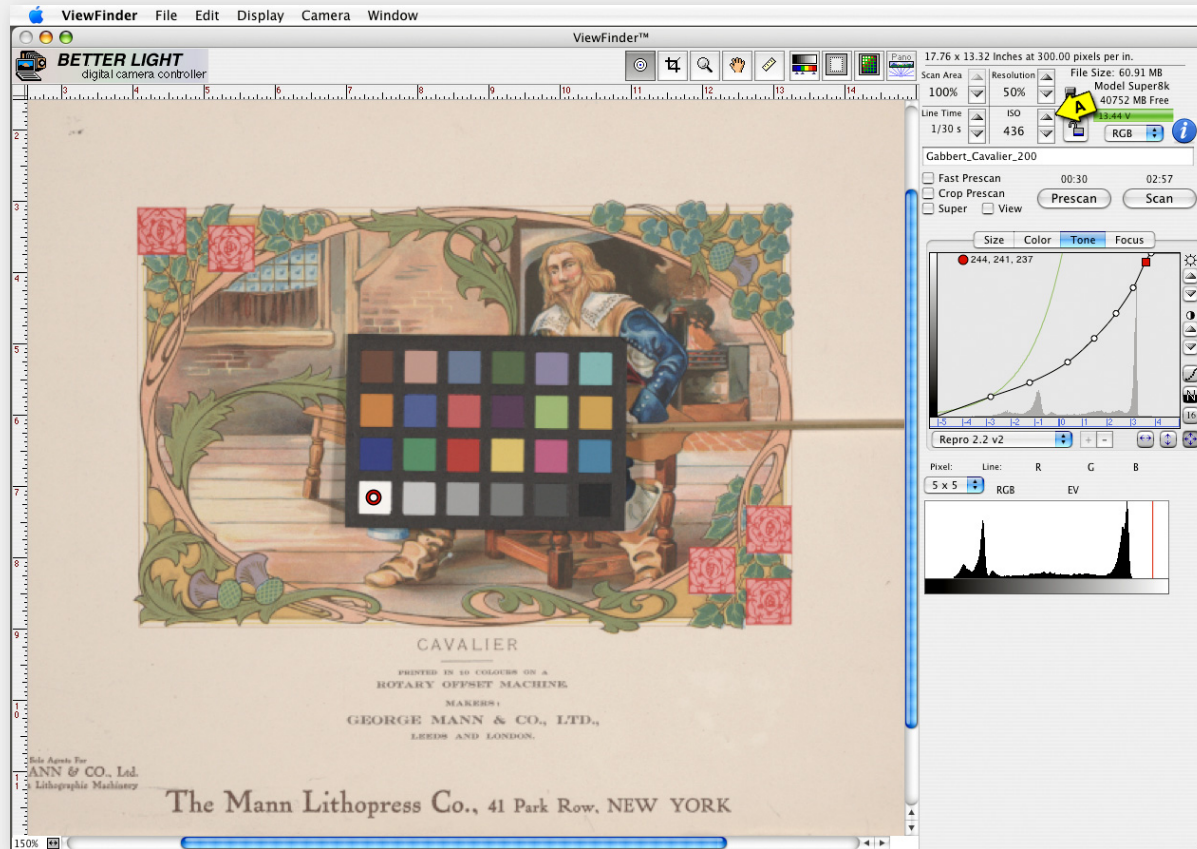
In this example the numbers next to the red circle which represents the White patch of the Macbeth chart shows 225 as the center (Green) value. That is a little low -- meaning the image is a bit too dark yet...we will adjust that to be higher in the next step.

## RELATED NOTES:

For your convenience while working in the *Tone* tab panel, the RGB values of the areas that you selected with the *Meter Spots* are displayed next to their specific colored circle and as color squares on the *Tone Curve line*. (Remember, the color circles are only for identification and are not representing red, yellow, green or blue of the color spectrum.)



# STEPS TO A PERFECT SCAN



As you begin your work in RGB images there are some guidelines that you can follow to maintain exposures that will avoid any serious problems in post-production:

HIGHLIGHT (white value) 235 to 245  
SHADOW (black value) 20 to 30

This will prevent over or underexposure and allow fine-tuning to be done later in an image editing program such as Photoshop®.

Since we had 225 as our Green value (center number) for the White patch (highlights) we can **increase the exposure slightly** to get into the range noted above.

A simple option for this adjustment is to INCREASE the ISO value. The ISO makes changes in 1/10th f-stop increments. Two clicks on the ISO "up" arrow (A) increased the ISO from 380 to 436.

This 2/10th f-stop change brought the Green value of the White patch from 225 to 241, which will be a clean white with detail.

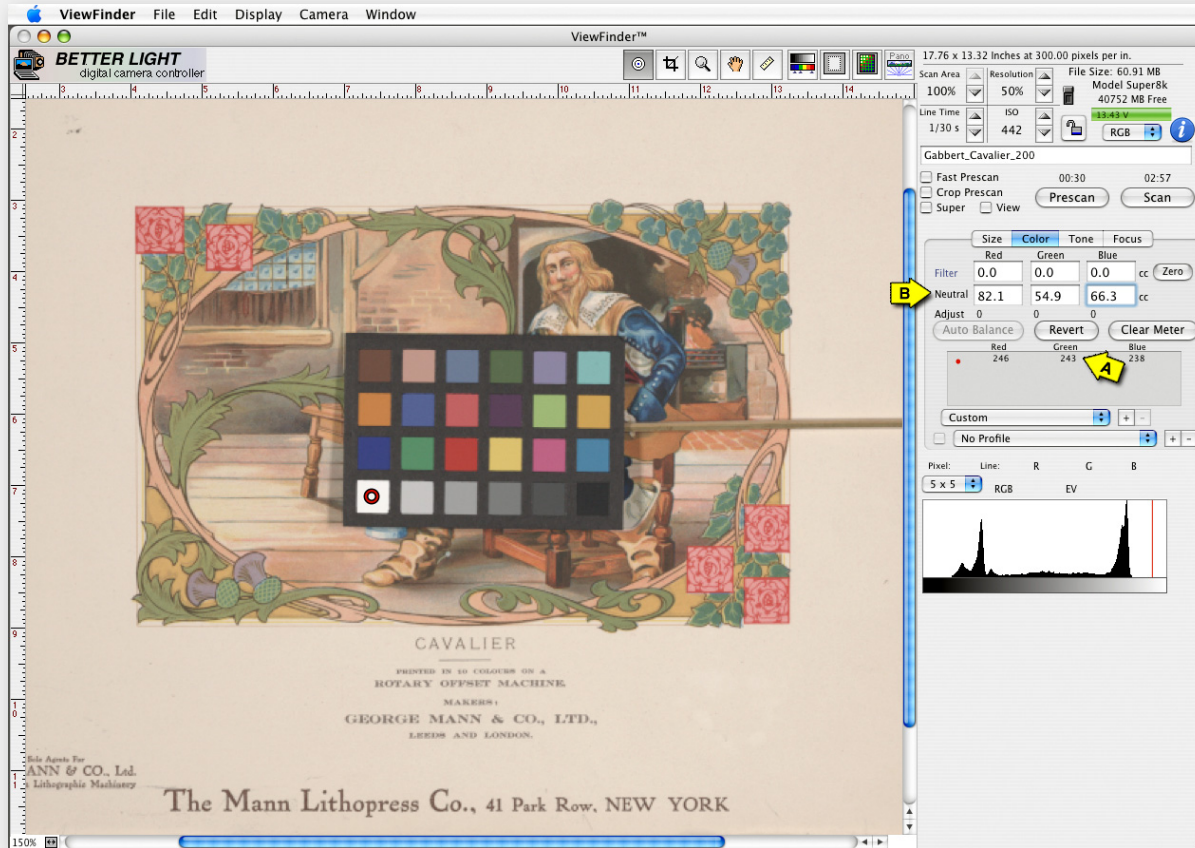
Let's return to the *Color* tab panel for one more fine-tuning step.

## RELATED NOTES:

**Exposure changes:** In addition to altering the ISO sensitivity as described to the right, you can also change the exposure (lightness or darkness) of the image with:

- 1) LINE TIME selection which varies in 1/3 f-stop steps.
- 2) The camera LENS opening (f-stop).
- 3) The amount or position of subject LIGHTING;
- 4) The BRIGHTNESS buttons on the far right side of the Tone Curve panel.

# STEPS TO A PERFECT SCAN



As we will see on the this slide, the target value of the white on the ColorChecker has been increased to 243 (A).

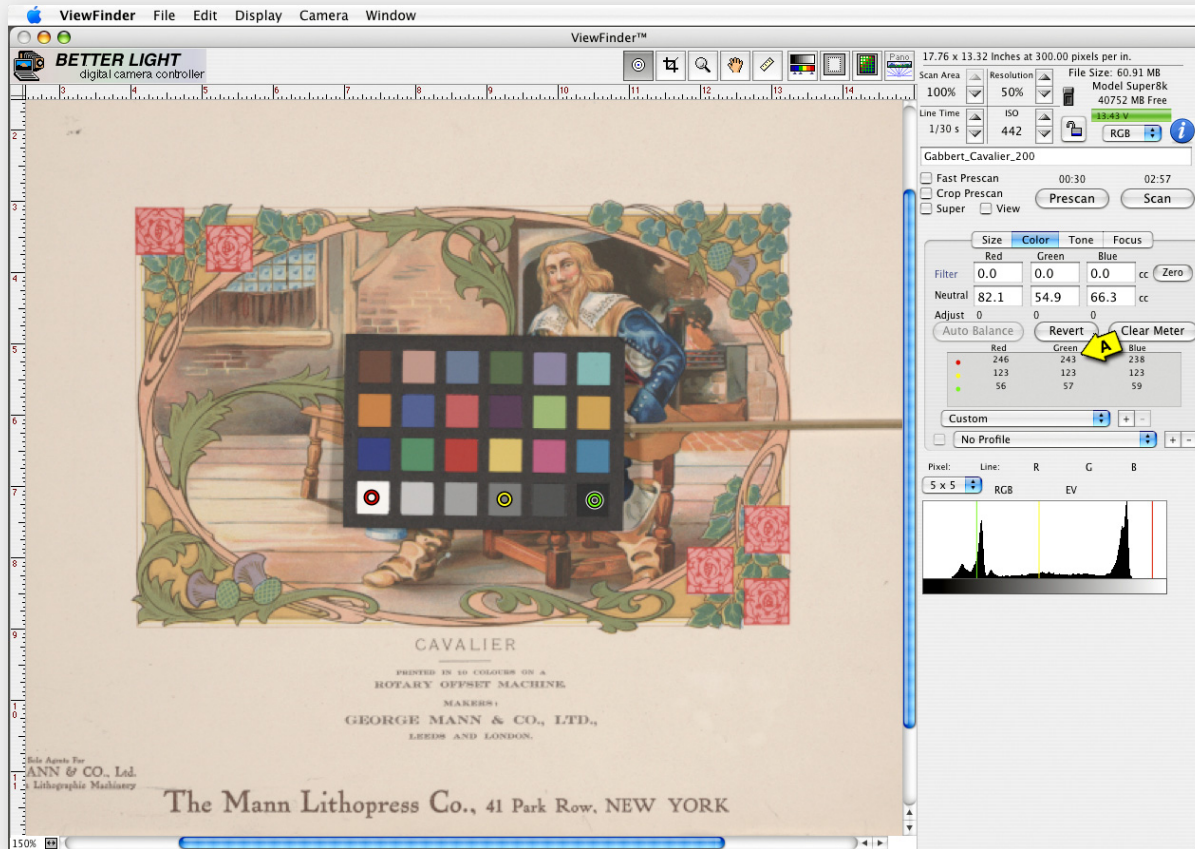
This 2-point boost was done by adding .6 to each of the RGB *Neutral* fields (B).

The Neutral numbers are in Color Correction (CC) values and 30 CC equal 1 f-stop change in brightness. You can manually change one or more of the in the *Neutral* windows, in as little as .1 CC (1/10th) value increments.

Small adjustments to exposure can be made in this way...just be sure to add equal values to each of the three color channels.



# STEPS TO A PERFECT SCAN



Let's check the settings...place an additional spot on the Black and the Middle Gray of the ColorChecker. The recommended values for these patches with a 2.2 gamma should be: **White: 243; Gray: 122; Black: 53.**

Our results (A) are 243, 123, 57, which is pretty good and we can expect an accurate relationship of the tones of the original artwork to be reproduced in the scan.

In this particular case we could live with the 57 value for the Black, but it could be darker to build the contrast and saturation. This original does not have deep shadow detail, however the type may reproduce better with a lower black value. We could alter the shadow density with a change to the shape of the selected *Tone Curve*. (Learn more about modifying the *Tone Curve* later in this tutorial).

This is where a calibrated monitor and some experience definitely helps you make the right decisions.

It is important to calibrate your monitor using a hardware device and software that guides you in making adjustments to your monitor settings that will standardize your viewing conditions.

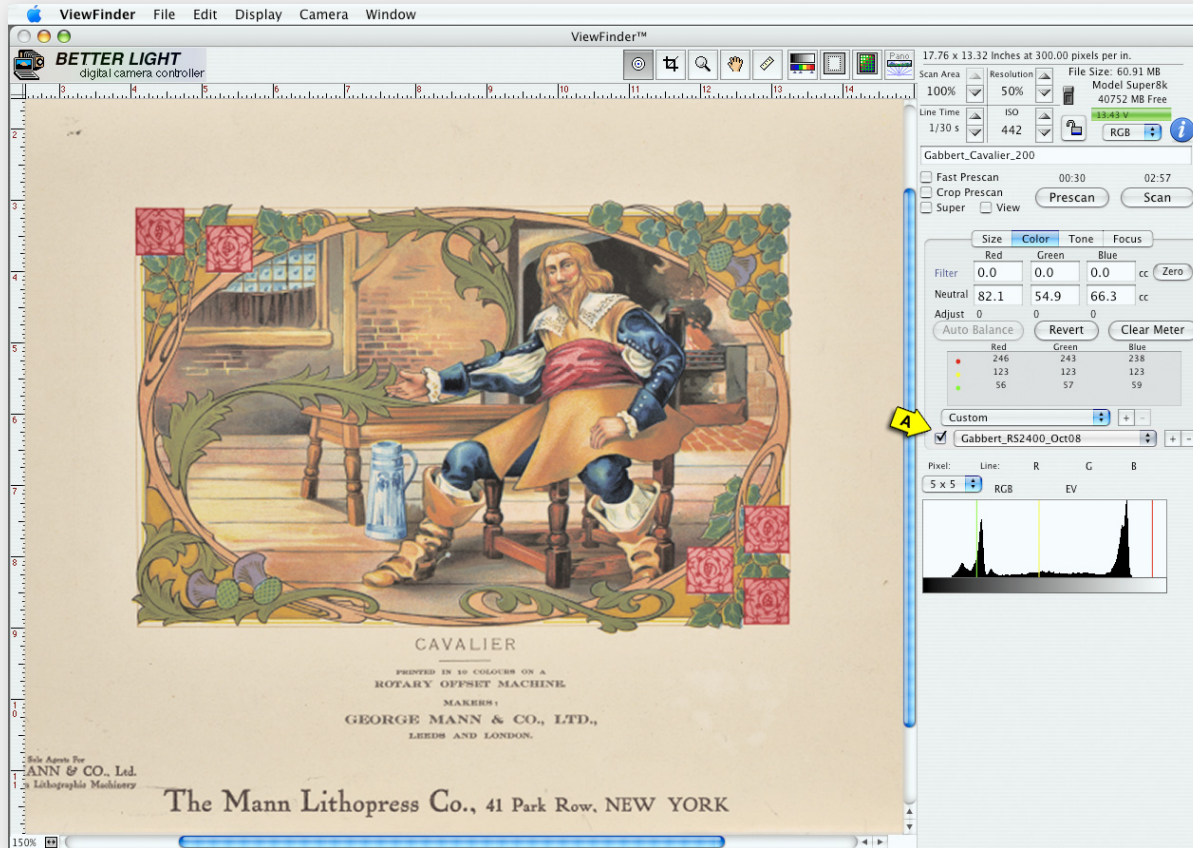
With a calibrated monitor you can trust your eyes and modify the curve for the best visual results.

## RELATED NOTES:

The target values with the Repro 2.2 curve for the popular X-Rite color charts are:

Chart	White	Middle Gray	Black
Color Checker 24	243	122	53
ColorChecker SG	245	119	32

# STEPS TO A PERFECT SCAN



This setup sequence has proceeded with **NO PROFILE** activated, so there is no compensation in place to correct for variations of color rendering in the camera sensor or the type of lighting you are using for scanning. Creating a custom capture profile will improve the accuracy of the color reproduction.

The preview image in **this slide has a color profile applied** which has improved the saturation and hue of the colors of this aged lithograph print.

An ICC profile for your camera and lighting capture conditions can be created with software such as X-Rite ProfileMaker® or InCamera® from Pictocolor and industry standard color charts such as the X-Rite Digital ColorChecker SG.

Your custom camera color profile should be added to the profile menu and the checkbox **(A)** checked to activate the profile. This profile will **optimize the color rendering** for the copy lighting and sensor in the scanning back.

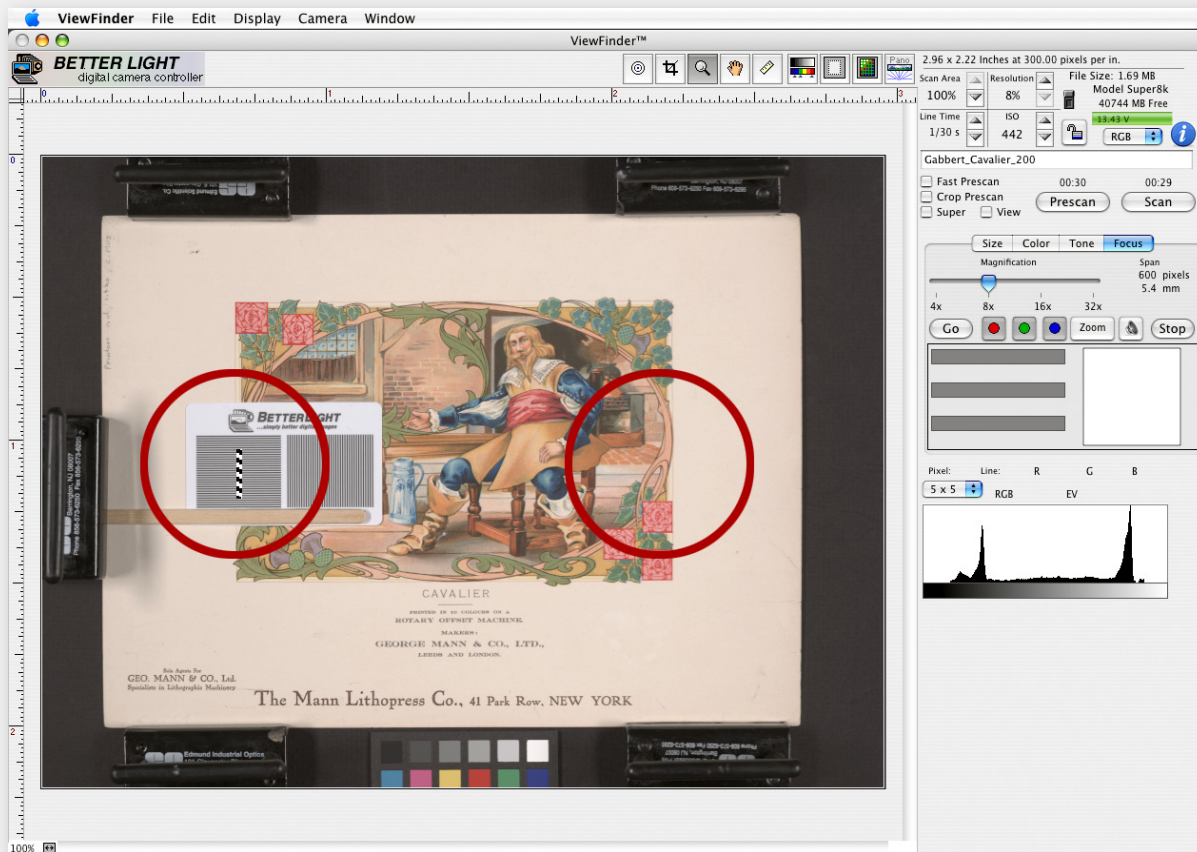
NOTE: If a custom camera profile has not been created for your camera and lighting situation, use the same profile that is designated as the *Color Space* in your Photoshop settings such as “Adobe RGB 1998”. This will help the Preview window in ViewFinder look like the final image when opened in Photoshop.



# OPTIMIZING CAMERA FOCUS WITH THE DIGITAL FOCUS TOOL



# DIGITAL FOCUS VERIFICATION



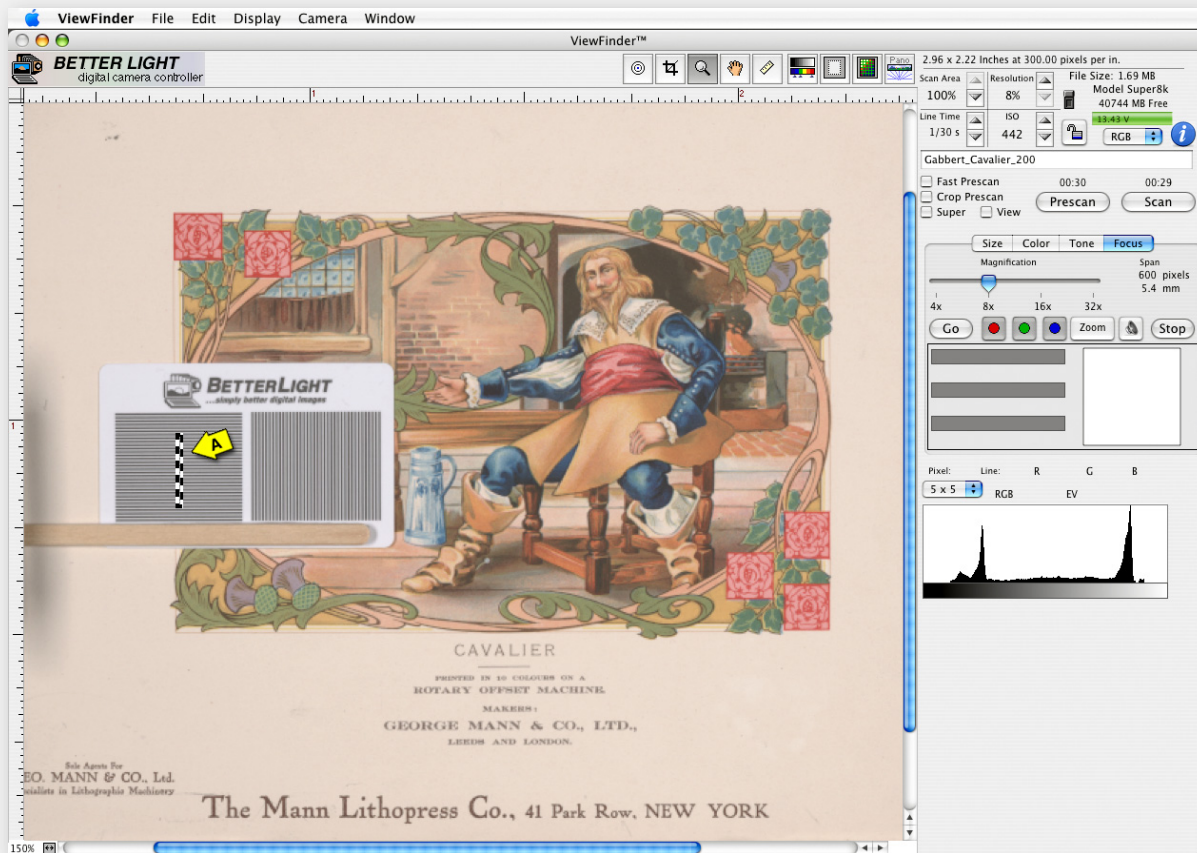
Better Light's ViewFinder™ Camera Control Software has a built-in **Focus Verification Tool** to help you achieve maximum sharpness for the images you capture.

**The best place for making a measurement is one-half way between the center of the image area and the short side of the frame** (indicated by red circles). This will account for the curvature of the lens and provide a compromise between the optical center and edge focus of the lens. When possible place the *Focus Card* in this area, or select an appropriate point of contrast on the subject matter.

Use caution in the selection of the area to use for the focus verification. As you focus, the image size changes slightly and the sensor may pick up small details that could make the focus numbers "jump" and make accurate focusing more difficult.

Use of the *Better Light Focus Card* minimizes this problem. For larger originals, you can print a larger focus target using the PDF file included on the ViewFinder software CD.

# DIGITAL FOCUS VERIFICATION



**The Focus Verification Tool** provides a “live” measurement of the contrast as seen by the CCD of the scan back. Measurements are made at the working lens aperture so focus is optimized for the exact capture conditions.

It is most accurate when there are a number of high-contrast lines or edges in your subject on the same, flat image plane. As a recommended target, several focus cards (as shown) are provided by Better Light.

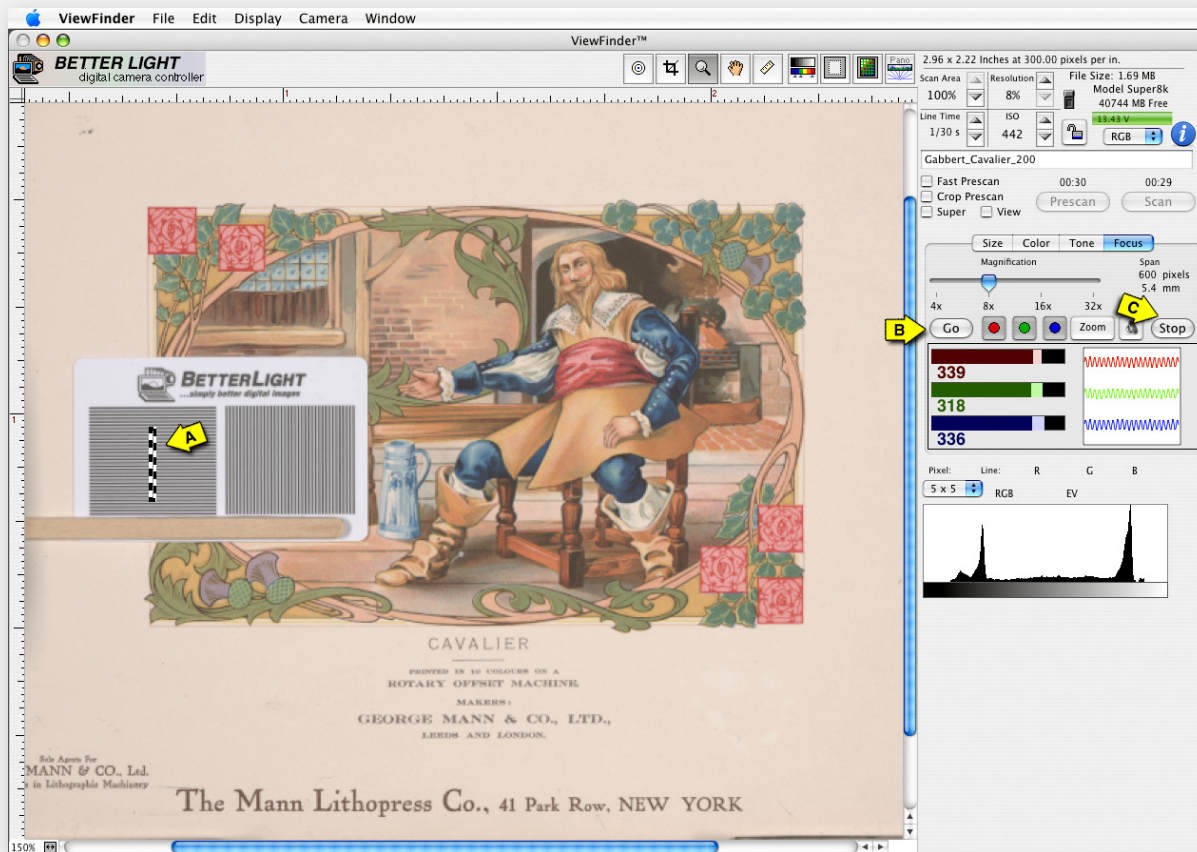
**To select an area in the Preview to use as the focus point**, click on a spot in the image and a horizontal or vertical “sampling rectangle” (A) will appear (parallel to the CCD in the camera). When activated, the CCD will travel to that specific point and provide a live reading of the contrast from the subject.

**For optimum focus accuracy, a normal Prescan should be made, with the “Fast Prescan” box unchecked.**

## RELATED NOTES:

The selected focus point must have some lines or pattern breaks that are PERPENDICULAR to the direction of the scanning back’s CCD when in the view camera. Two sets of parallel lines are provided on the focus cards. The focus “sampling area” (A) shown above represents the VERTICAL orientation of the CCD (scan back is horizontal in camera) and is sampling the horizontal lines. The vertical lines would be the recommended target when the scan back is placed in the camera from the top (CCD would be HORIZONTAL).

# DIGITAL FOCUS VERIFICATION



The Better Light system is unique in its ability to measure and compare all three color channels at one time. The comparison of the Red, Green and Blue focus points will allow you to “compromise” the focus position for the best overall sharpness based on how the lens is focusing the different colors of light.

In many cases, just using the GREEN focus channel will give excellent results, since the green channel records the most image detail.

**The focus procedure is quite simple.** On your Preview image, click the mouse over the *Focus Card* or the area desired as your ideal focus point. A dotted-line rectangle (A) will appear. Click the GO button (B) and the scan bar will move to that precise position and focus data will be displayed in both graphic and numeric form for any of the R,G or B values you have activated.

The graphs will change and the numbers will vary as you manually adjust the camera’s focus knob on the rear standard (holding the scanning back). As the focus improves, the contrast increases, the numbers go higher; as the focus becomes worse, the numbers go lower.

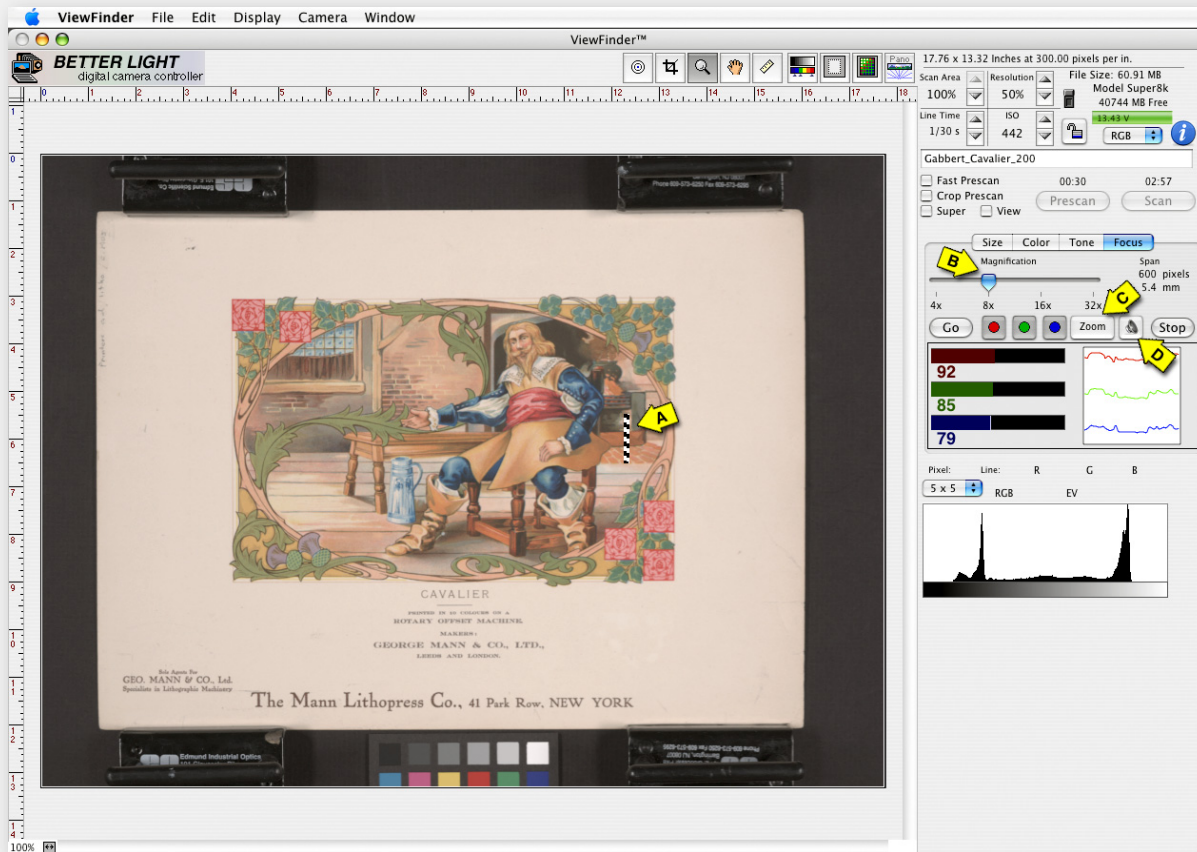
When the camera is focused to your satisfaction, click the STOP button (C) or click on any other tab panel.

## RELATED NOTES:

The numbers represented on the focus scale are representative of the overall contrast that the CCD is reading. The exact number will vary depending on sharpness of focus, subject contrast, and even the selected Tone Curve. **There is no “right” number**, the objective is to change the camera focus control so the number is as high as it can go before it starts to go back down to lower numbers. A lighter color trail is left on the color bars to show the peak focus point that you had reached.



# DIGITAL FOCUS VERIFICATION



With this basic understanding of the *Focus Tool*, we will proceed to check the focus on our example image.

In this case, the artwork is providing adequate hard lines and image contrast. We have clicked the mouse over a break of contrast in the image as shown (A). The fireplace is providing horizontal lines and adequate contrast to be measured by our vertical sensor, and it is within the recommended area for optimized focus.

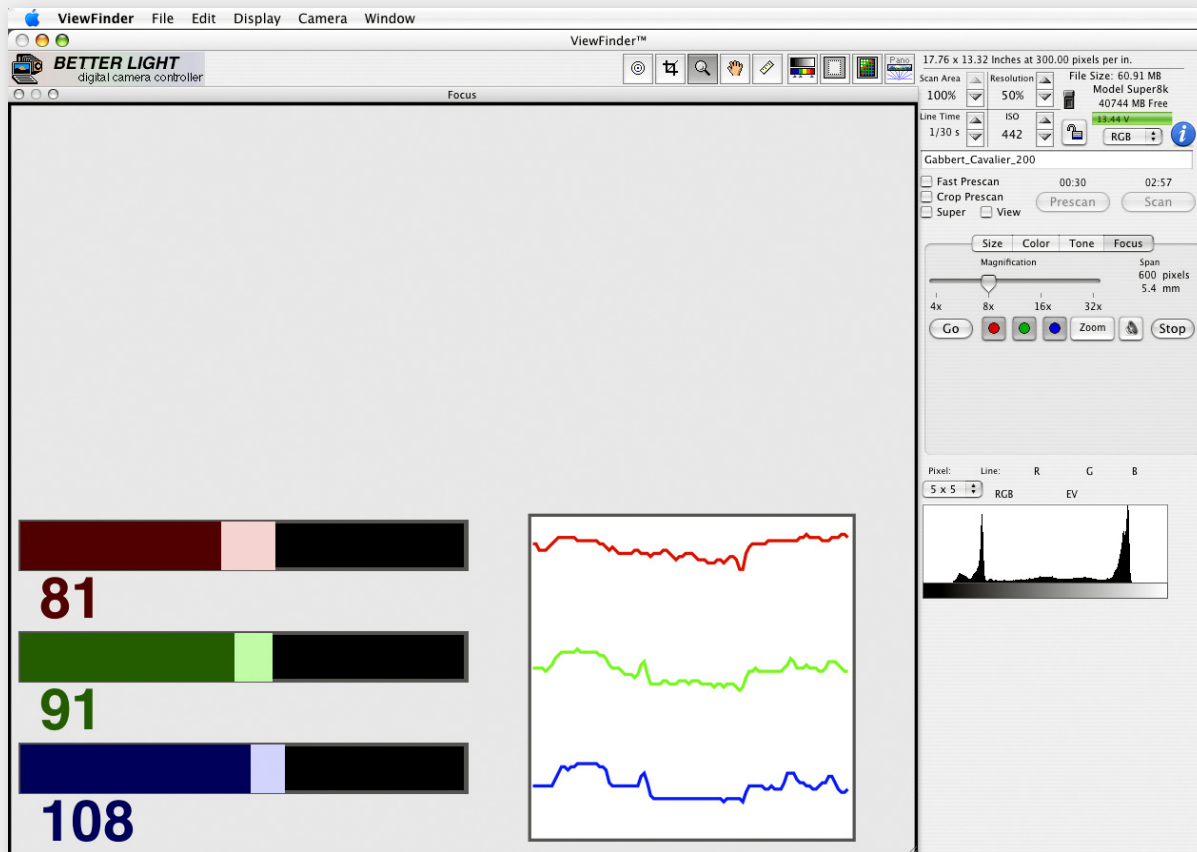
This particular magnification setting (B) is 8X, which is a 600 pixel, 5.4mm span in this particular example. (4X is the largest sampling area and 32X is the smallest). Adjust the sampling size to isolate the best details to focus on.

Once the target area is selected, click on the GO button to move the CCD into position. When the number scales and the waveform graphics appear, you can choose to **enlarge the whole Focus panel by clicking the ZOOM button**, (which is what we did for the next slide).

## RELATED NOTES:

Additional user options are included on the Focus Tab panel. The **Magnification Slider** changes the size of the sampling area (A) so you can include a larger span of the Preview image for a target, or reduce it to measure a very specific contrast break point. The **ZOOM button** (C) will transfer the Focus panel to fill the entire Preview window to allow easy viewing of the monitor when the camera position is a distance from the computer or you have to be on a ladder for focus. An **Audible Tone** (D) (Macintosh only) is also available with a variable pitch to help you find the optimal focus quickly.

# DIGITAL FOCUS VERIFICATION



## RELATED NOTES:

It is NOT possible to determine relative focus by simply comparing the focus-quality number displayed for each channel, since each color stripe is sensing a slightly different physical location within the image. For each color you want to be aware of the PEAK number to indicate the most accurate focus. If the color channels peak at different camera-focus positions, you may wish to find a compromise “best-focus” position.

When the CCD is activated, a number, a bar graph and a waveform graphic will appear for each of the color channels that you have selected.

Checking all three colors is helpful to check the lens’ focus variation for each color. However, using only the Green channel will be adequate in most situations.

Manually adjust the camera’s focus control (on the rear standard of the camera) and observe carefully what changes occur to the number values and the movement of the bar graph. In this example, as we move away from a more focused position, a lighter colored gap is shown between the solid color and the black parts of the bar. This indicates that the focus was better before, and the focus control should be moved the opposite way.

Small movements, rocking the camera control back and forth, will reveal the peak number and indicate that the camera is as accurately focused as possible.

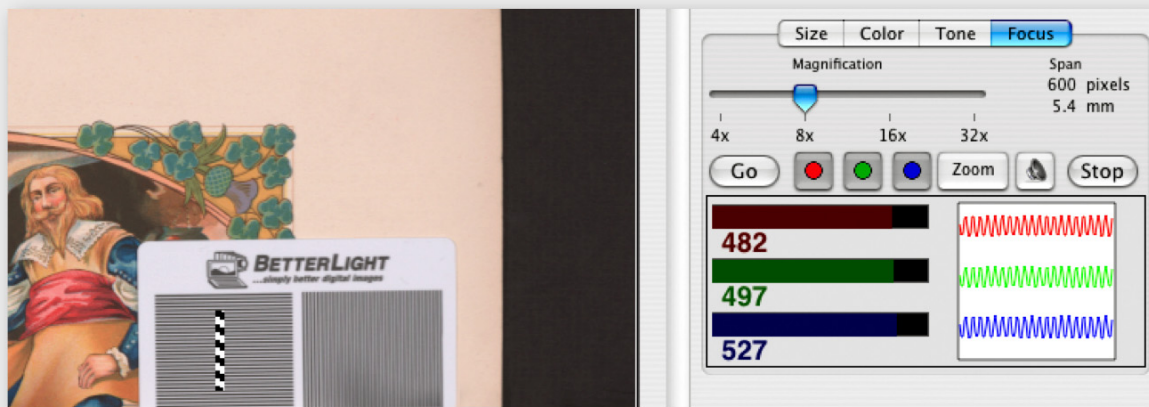
The focus tool is extremely sensitive and is likely to “bounce” a little if the sampling area picks up additional detail as the focus changes. Just touching the camera will vary the readings, and expect a minor change in the number values when you retighten the focus knob.

# DIGITAL FOCUS VERIFICATION



As shown by the top image, we have moved the focus control of the camera until we reached a peak of sharpness for all three numbers. As the camera locks are tightened, some slight variations will occur in the numbers -- you can see a slight gap in the blue bar graph, but the change should not affect the focus.

As you can see, the numbers are NOT EQUAL, but that is normal since each R,G or B sensor stripe is not reading exactly the same point and every lens will have some variation in the transmission of light.



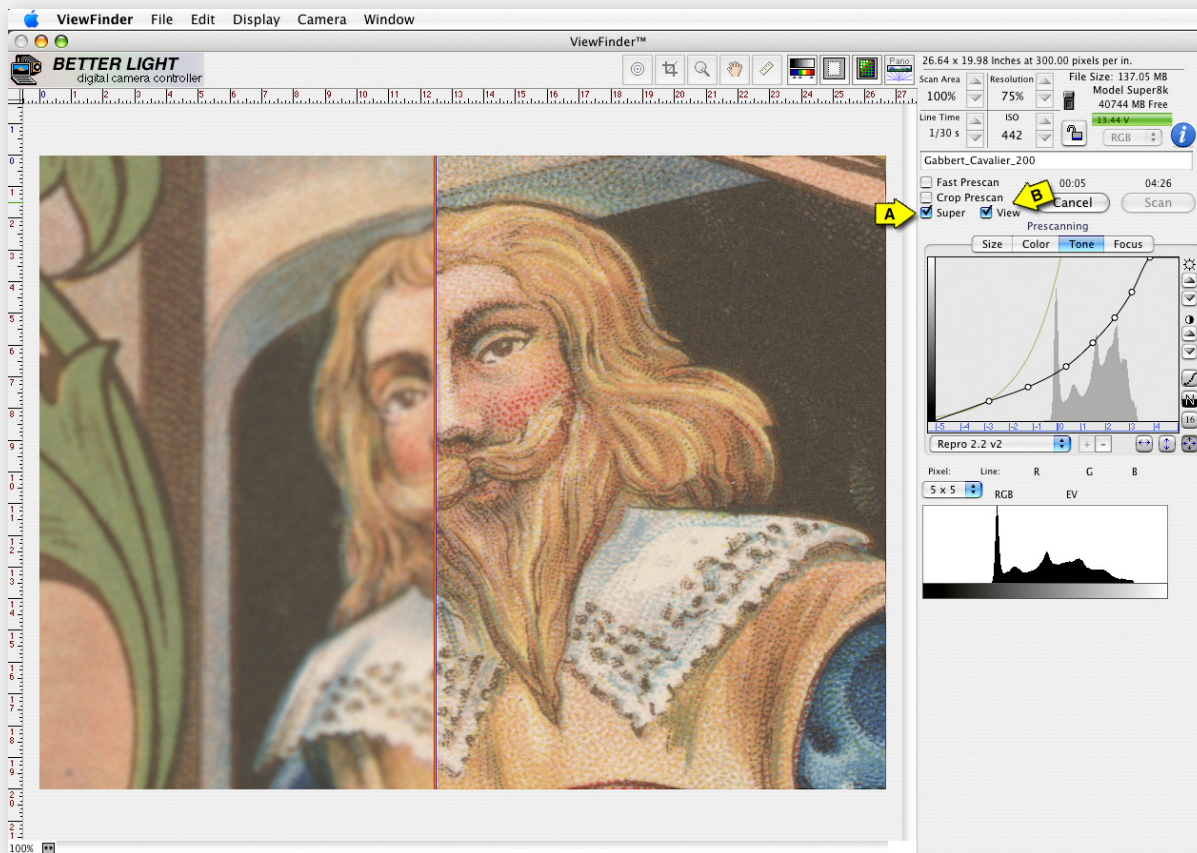
The bottom image was captured with a Focus Card put into the same sampling position without touching the focus of the camera. This demonstrates how the numbers and the graph changes with variations in amount of contrast and the pattern of the sampled area.

When you are satisfied that you have reached the highest peak value for your focus, click the STOP button or click on another tab to exit the Focus mode and return the CCD to the home position.

Refer to the Users' Manual for more information about selecting proper focus sites in the image and how to optimize the focus.



# DIGITAL FOCUS VERIFICATION



In very critical situations, it may be wise to do a small “swatch test” scan at the final resolution to check the image sharpness.

You can check focus with a full-resolution sample by checking the **SuperView** box (A) under the *Line Time* arrow buttons. The Prescan button turns to *SuperView* and in the time of a Prescan you can check your full resolution sharpness.

When you check SuperView, a red rectangle will appear in the Preview window representing the area that will be sampled at full resolution. **The size of this rectangle will vary with the active resolution setting.** Click and drag the red rectangle to the part of the image you wish to inspect at full-resolution.

As the Prescan is captured you will see the enlarged results in the Preview window. As shown in this screen, leaving the rectangle in place you can compare “before & after” results. By making a focus change while the prescan is capturing the image, you can see the effects as “live focus”. You can also use the Focus Tool with SuperView activated when you need to have an enlarged view for critical placement of your focus selection.

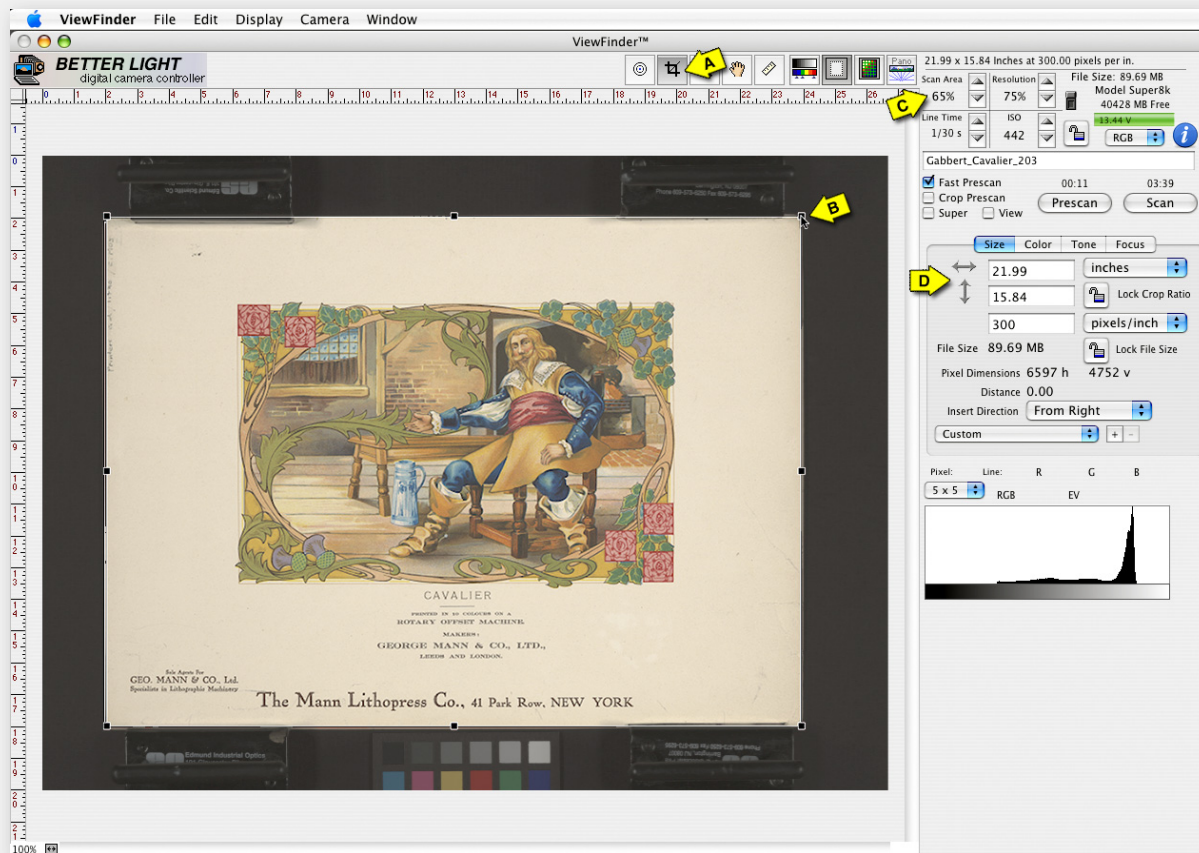
Return to the full Prescan window view by unchecking the *View* box (B).



# THE FINAL STEPS...

# SETTING CAPTURE SPECS

# THE FINAL STEPS...CAPTURE SETTINGS



## 1) SETTING THE CROP AREA:

We have neutralized color, set ideal exposure, selected the contrast *Tone Curve*, optimized the focus, and are now just about ready to capture the final image.

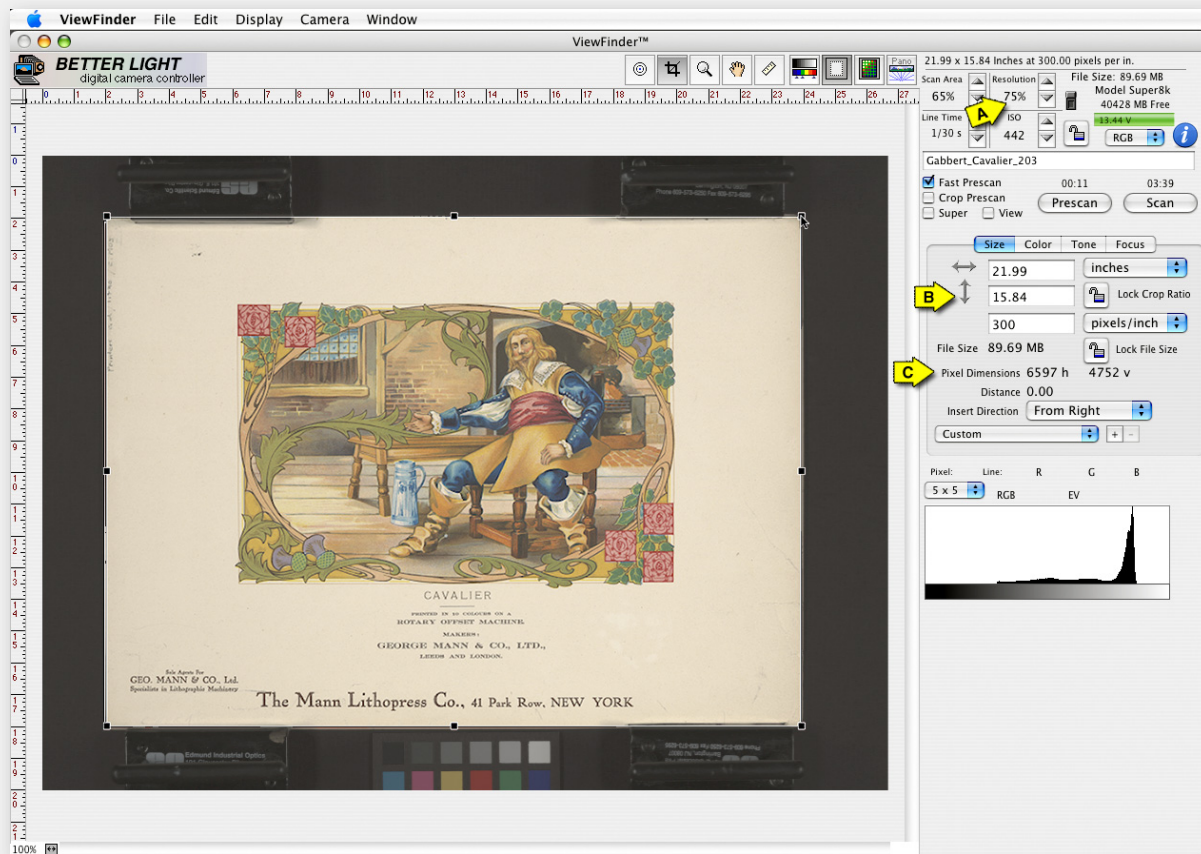
Before we do, the final CROP can be set to eliminate any unwanted area that the lens is seeing from the final scan. This will keep the file size smaller and remove any clutter from around the subject.

### *You can set the cropping in several ways:*

1. Select the *Crop Tool* (A) from the menu bar at the top of the screen to activate the Crop Rectangle. With the mouse, click and drag any of the eight “handles” (B) on the corners or sides of the crop rectangle. Resize and move the shape of the rectangle as needed.
2. Use the “up and down” arrows for *Scan Area* (C) to adjust the amount of the Preview area you wish to capture. These buttons will retain the same proportion of the full Preview window (default) or your current rectangle shape.
3. Type in a specific size ratio that you wish for the rectangle in the *Size Tab* panel (D). The shape of the Crop Rectangle will change within the limits of the file resolution settings. These settings can be confusing, but this provides a size reference at the specific pixels per inch (ppi).



# THE FINAL STEPS...CAPTURE SETTINGS



## 2) SIZE AND RESOLUTION SETTINGS:

The ViewFinder software allows you to select one of several Resolution settings, depending on your camera model. This gives you more control of the size of the digital file created. The *Resolution %* (A) selected and the final crop area will determine the file size.

The size specifications shown on the Size Tab panel (B) can be helpful to determine how large your final output can be at the specific Pixels per Inch (ppi) that is set in the window.

Set the ppi to correspond to the recommended resolution of your printer or output device (for example: 300 ppi for offset printing, 150 ppi for ink jet printers, etc.).

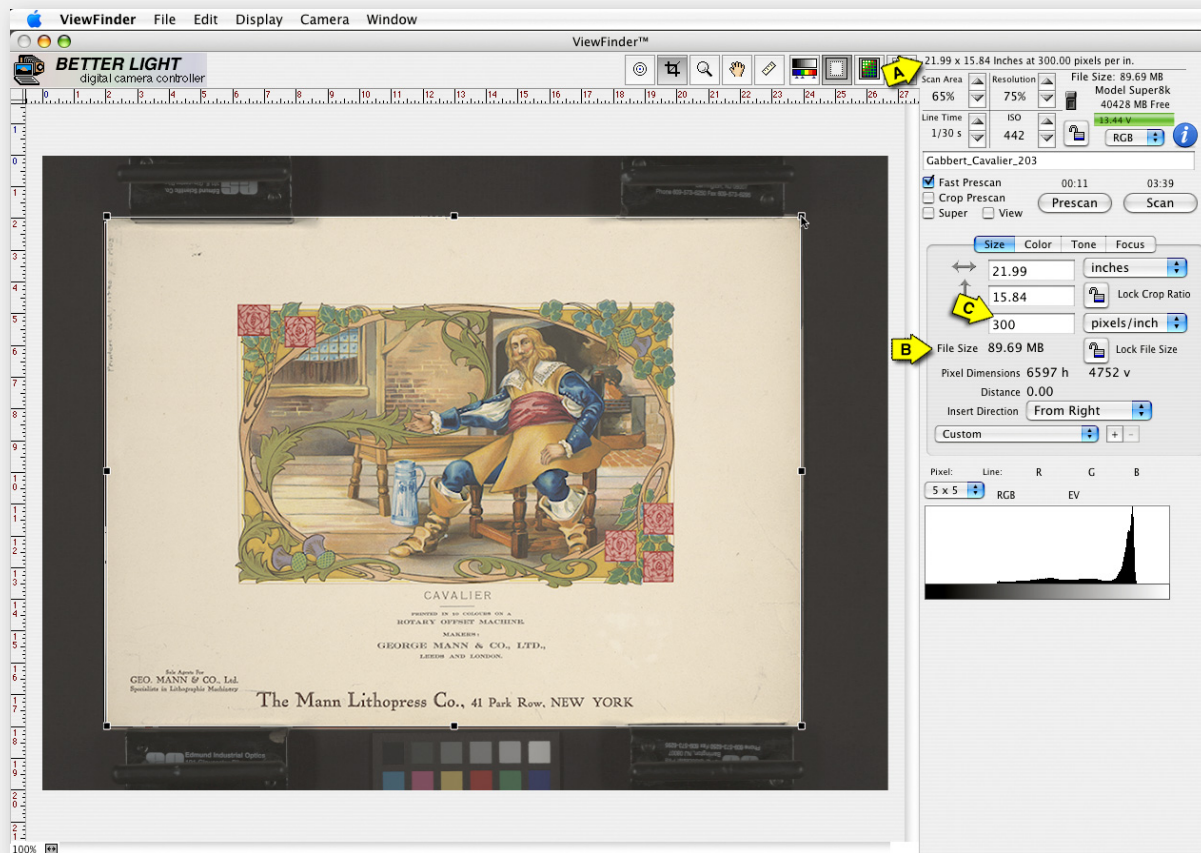
**Use the up/down buttons to pick the Resolution level that is best for each image you are scanning.** The Resolution is not linked to any other settings that will change your image quality.

Changing the Resolution, however, will change the *Scan* time. Higher resolution settings will result in longer scan times.

### RELATED NOTES:

The *Resolution %*, the *Line Time* and the final *Crop* are factors in determining the final file size and also the *Scan Time*. The *Scan Time* is the result of multiplying the total number of scan lines by the *Line Time*. The sensor has a fixed number of pixels on the short dimension of the scanning back and the number of lines of pixels created on the long dimension will vary with the Resolution % selected. In the example above, the *Resolution* Setting is 75% and the cropped area will be captured with 6597 scan lines (pixel lines) on the long dimension (C). At 1/30th second *Line Time* per scan line the total *Scan Time* will be 3 minutes and 39 seconds.

# THE FINAL STEPS...CAPTURE SETTINGS



### 3) SIZE AND RESOLUTION SETTINGS:

As you change the *Resolution* percentage setting the Output size of the image and the File Size in megabytes (MB) will be shown at the top of the monitor (A) and will also be shown on the *Size* panel (B).

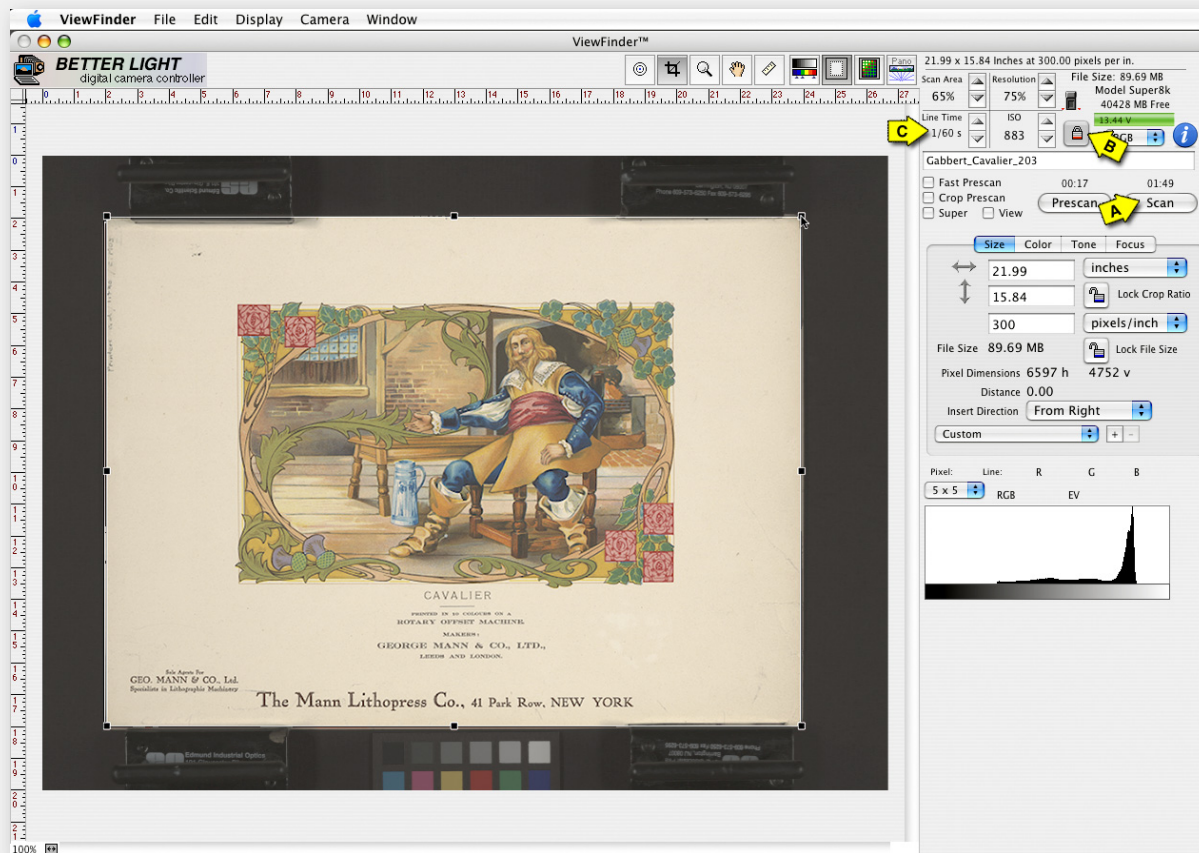
Each digital image is “measured” by the Pixel Dimensions -- the number of pixels in the image along the length and the width. The size of the digital file is normally given in MB (megabytes).

The overall number of pixels in a given file can be output at different sizes depending on the printer resolution or ppi that it uses. The higher the ppi (Pixels per Inch) the better fine detail and smooth edges will be maintained in the image. When the ppi is too low, you begin to see pixelation and the image becomes ragged and chopped up by the individual shape of the pixels.

Change the PPI amount (C) to see how the output dimensions will change to be sure you are capturing a file of adequate size for your client's needs.

When making your final capture, it is better to make a file size larger than you would anticipate needing since a digital file can be reduced in size with more success than it can be enlarged.

# THE FINAL STEPS...CAPTURE SETTINGS



## 4) READY TO SCAN:

The final image is now ready to be scanned as a digital file. All of the settings have been adjusted to make a capture that is a near-perfect, first generation digital image.

On the previous slide the total *Scan Time* was 3 minutes and 39 seconds (shown above the Scan button (A)). The ISO was 442. To reduce the scan time, you would need to work at a faster Line Time -- which would require a higher ISO, more light intensity or a change to your camera lens opening.

The *Exposure Lock* icon (B) was clicked to make a change to the exposure settings without changing the image brightness. Clicking on any of the *Up* and *Down* buttons (C) will change the *ISO* and *Line Time* values at the same time... as the *Line Time* increases, the *ISO* goes down and vice-versa.

As an example we chose 1/60<sup>th</sup> second Line Time, which changed the ISO to 883 and cut our exposure time to 1 minutes 49 seconds. In most cases, it is recommended to work at lower ISO levels to minimize digital noise.

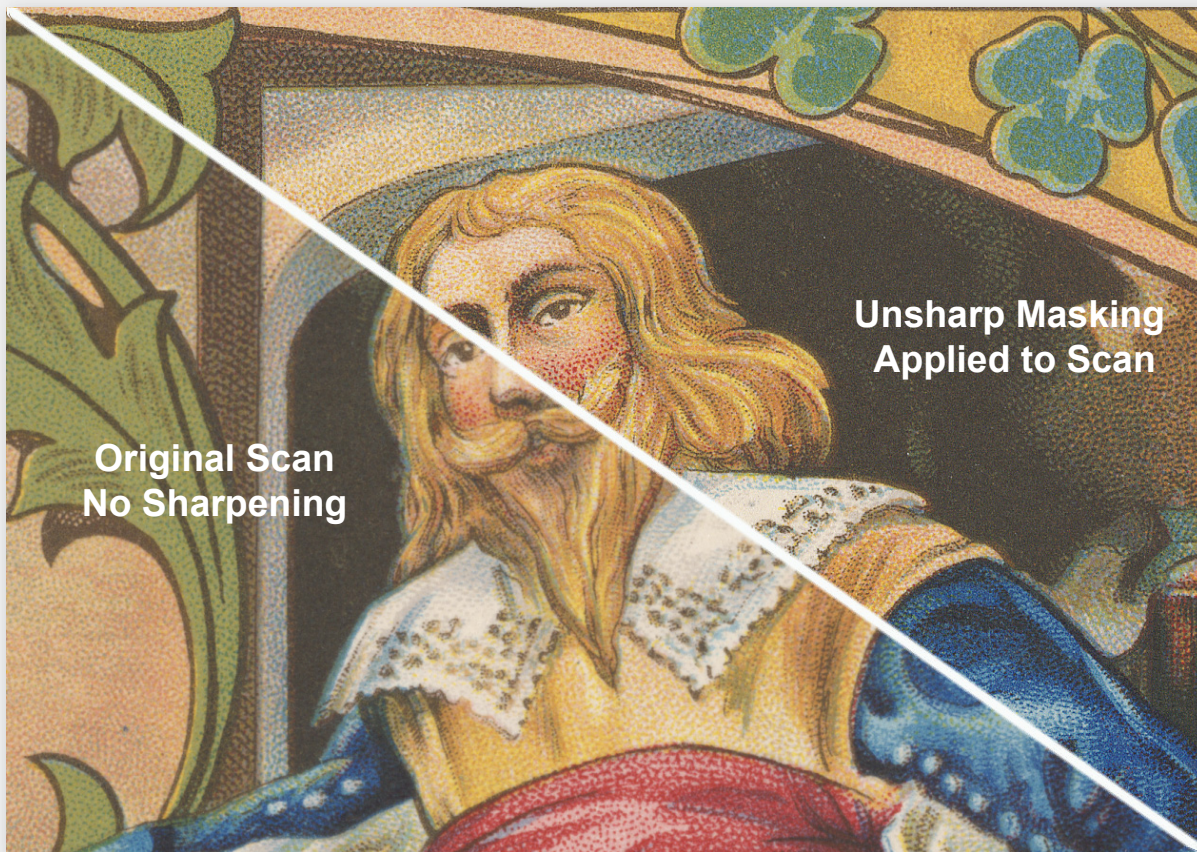
## RELATED NOTES:

When you click on the SCAN button (A), the camera insert will hesitate momentarily while checking the “dark calibration”, then moves the scan bar to the bottom of the insert and begins to capture a high-resolution digital image. The files will be stored on the dedicated hard drive. The image directory is found under FILE > File Manager in the Menu Bar at the top of the monitor screen. You can retrieve the files and save them to another drive, network folder or disk just like any other hard drive. In the ViewFinder Preferences panel you can also select options to Auto Save and Auto Open the files.

**Press the Scan button to initiate the image capture.**



# THE FINAL STEPS...CAPTURE SETTINGS



#### 4) FINAL INSPECTION:

If you have selected *Auto Open Retrieved Scans* in Preferences, the image should open in Photoshop. If not, you can retrieve the image from *File Manager* and save to your desired folder or server.

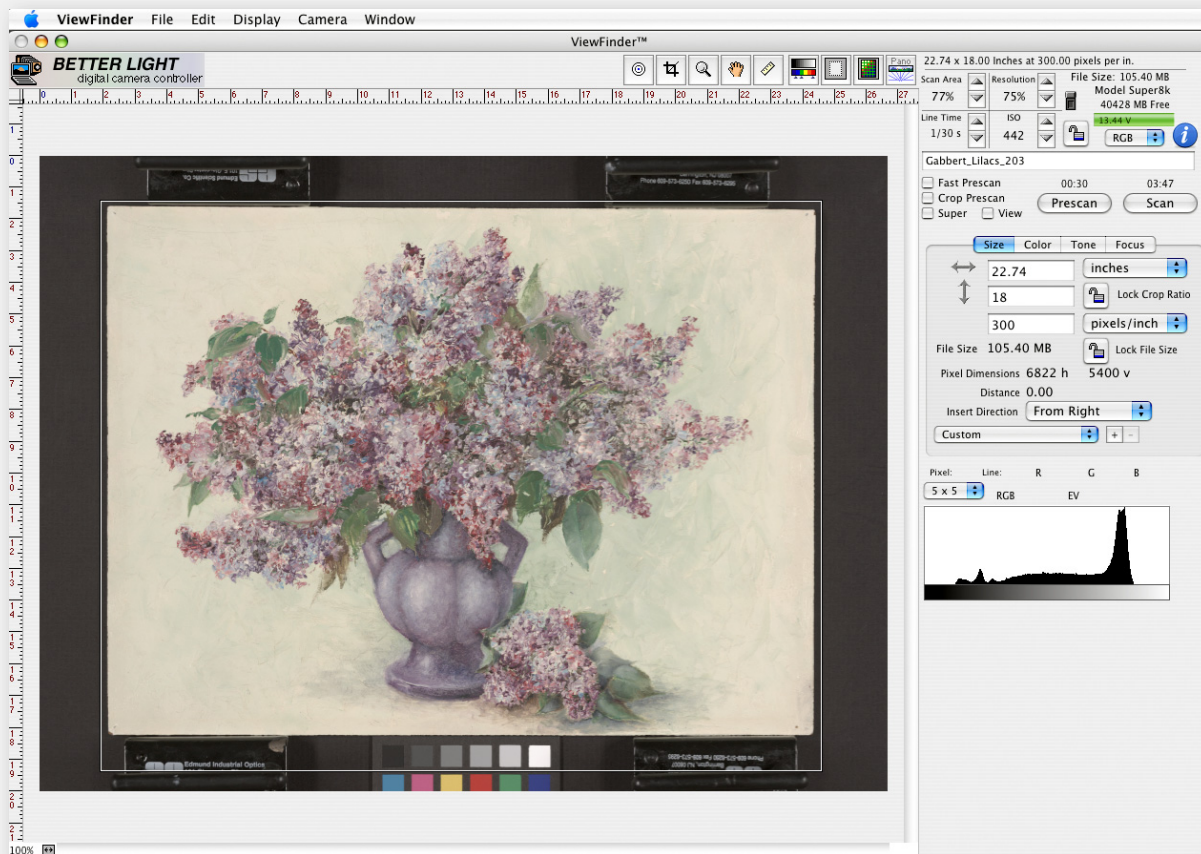
**Inspect the image at 100%** (actual pixel size) in Photoshop, looking for overall sharpness on all corners, brightness, tonal contrast, and any physical or scanning flaws. Be sure all quality requirements are met before proceeding to the next subject.

Perform any Photoshop functions as instructed, including mild sharpening with **Unsharp Masking** or **Smart Sharpen** if permitted, or store to appropriate folder for post processing.

#### RELATED NOTES:

With all scanned images...scan camera, flat-bed scanner, or high-end film scanner, it is necessary to do some amount of Unsharp Masking (USM) to visually sharpen the edges of the image. This unsharp masking step is generally done as the very last step in production, taking into account the characteristics of the specific output device. However, you may prefer to add a "visual sharpening" level to the image, especially if the digital file will be released to someone else for output. In Photoshop, an AMOUNT of 100-200, RADIUS of .3 to .6, and THRESHOLD of 0 (zero) would be adequate to improve the image sharpness.

# THE FINAL STEPS...CAPTURE SETTINGS



## The Next Images...

If you have additional pieces of approximately the same size or smaller, place the next piece of art as close to the same position as the previous one. It's best to start with the largest pieces in the session and work down to smaller ones to minimize the moves of the camera and lights.

- 1) Make a *Prescan* and check your positioning and cropping.
- 2) Check exposure with *Tone Zones*. (See *Related Notes* below).
- 4) Check *Resolution* setting for necessary size of file.
- 4) Press the *SCAN* button.
- 5) Repeat steps as required for additional scanning.

## RELATED NOTES:

Using the *Default* menu option when *Tone Zones* is activated, or a modified set for your custom “high” and “low” exposure limits, will give you a quick look to prevent exposure errors. In a series of work, you may find variations in the subject characteristics which could be different than the original subject. As a suggestion, setting “danger” zone colors for 245-255 in highlights and 0-30 for shadows will warn you if the current exposure setting or tone curve could cause a loss of detail. Add a buffer zone of another color of about 10 units on each side of these zones to identify tones that are close to the danger values.





# CHANGING CONTRAST WITH TONE CURVES



# CHANGING CONTRAST WITH TONE CURVES



The ViewFinder™ software features a **precision processing curve editor** for exact contrast and tonal gradation adjustments. All modifications are shown on the preview image to guide the photographer to the desired results.

Each processing curve determines the response of the digital camera from black to white — optimizing the image data for lighting conditions, subject matter, printer characteristics, or artistic expression. “In the old days”, these variations were more difficult to control with the fixed tonal response of a single film emulsion...but now, we can **create our own “digital emulsion”** to optimize the rendering of the subject’s unique features under the particular illumination available.

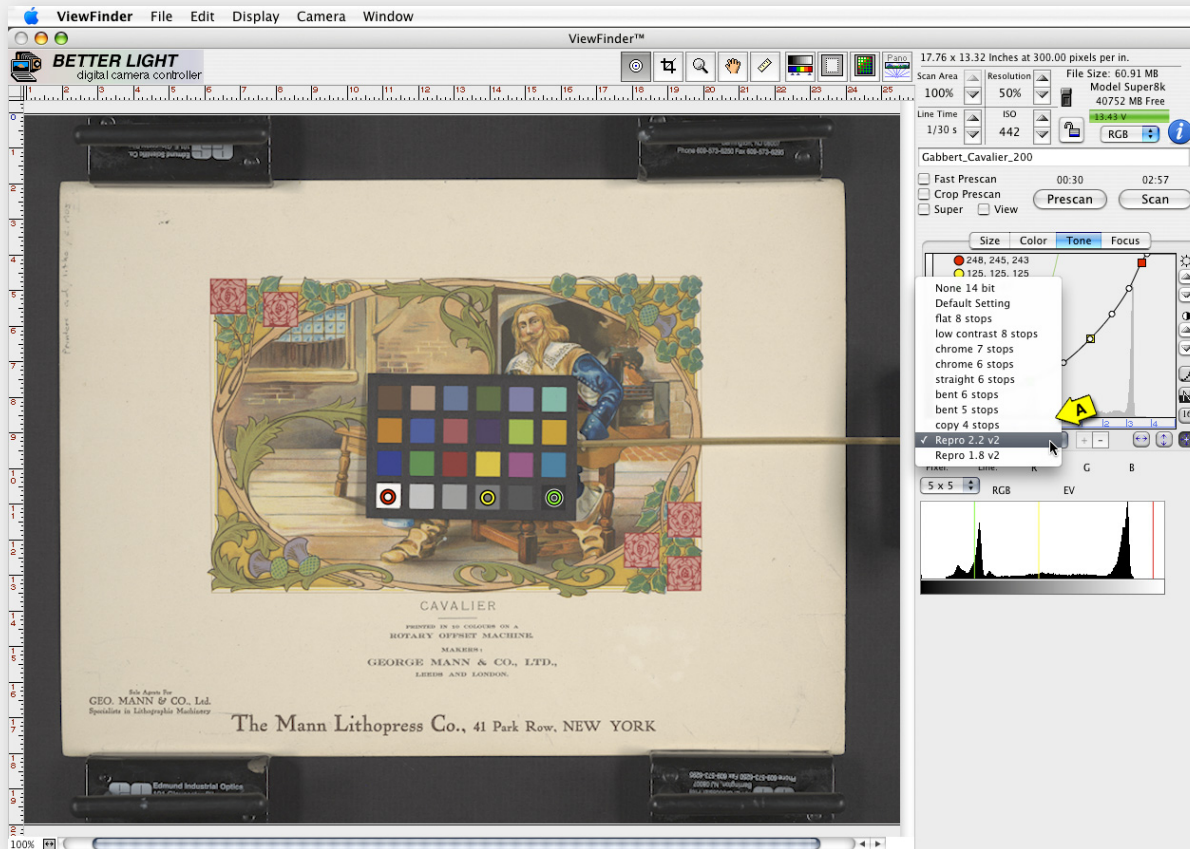
ViewFinder™ is shipped with a selection of tone curves which have been preloaded into the *Tone Curve* pop-up menu. From these choices, each of which is fully adjustable and renameable, the photographer can quickly select from a group of familiar curves to provide the contrast and tonality range required for a given setup.

**The Better Light processing curves are meant as a starting point** for varied photographic applications. They will provide results similar to the combined effects of a selected film emulsion and processing method plus the subsequent manipulations of tones when scanning the film to digital information.

## RELATED NOTES:

A visual comparison of the Tone Curve options is available on the Better Light website at: [http://www.betterlight.com/downloads/Manuals-Tutorials/tonecurve\\_samples5.pdf](http://www.betterlight.com/downloads/Manuals-Tutorials/tonecurve_samples5.pdf)

# CHANGING CONTRAST WITH TONE CURVES



The preloaded curves differ primarily in their overall contrast, ranging from a “straight” function that spans the entire dynamic range of the camera relatively uniformly, to functions that approximate the response curves of transparency films, to functions for specific applications such as copy work. Most of the tone curves are named with their primary function followed by the approximate f-stop range for the curve (for example, “chrome 6 stops”, a transparency simulation with a 6-stop range).

**Click on the TONE tab** to show the tone curve window. At the bottom of that window is a pop-up menu bar (A).

When you click on that bar a list of preset Tone Curves will appear. These curves provide a variation of dynamic range and contrast levels that will be starting points for a wide variety of subject and lighting combinations -- from daylight landscapes to reproduction of watercolor and oil paintings.

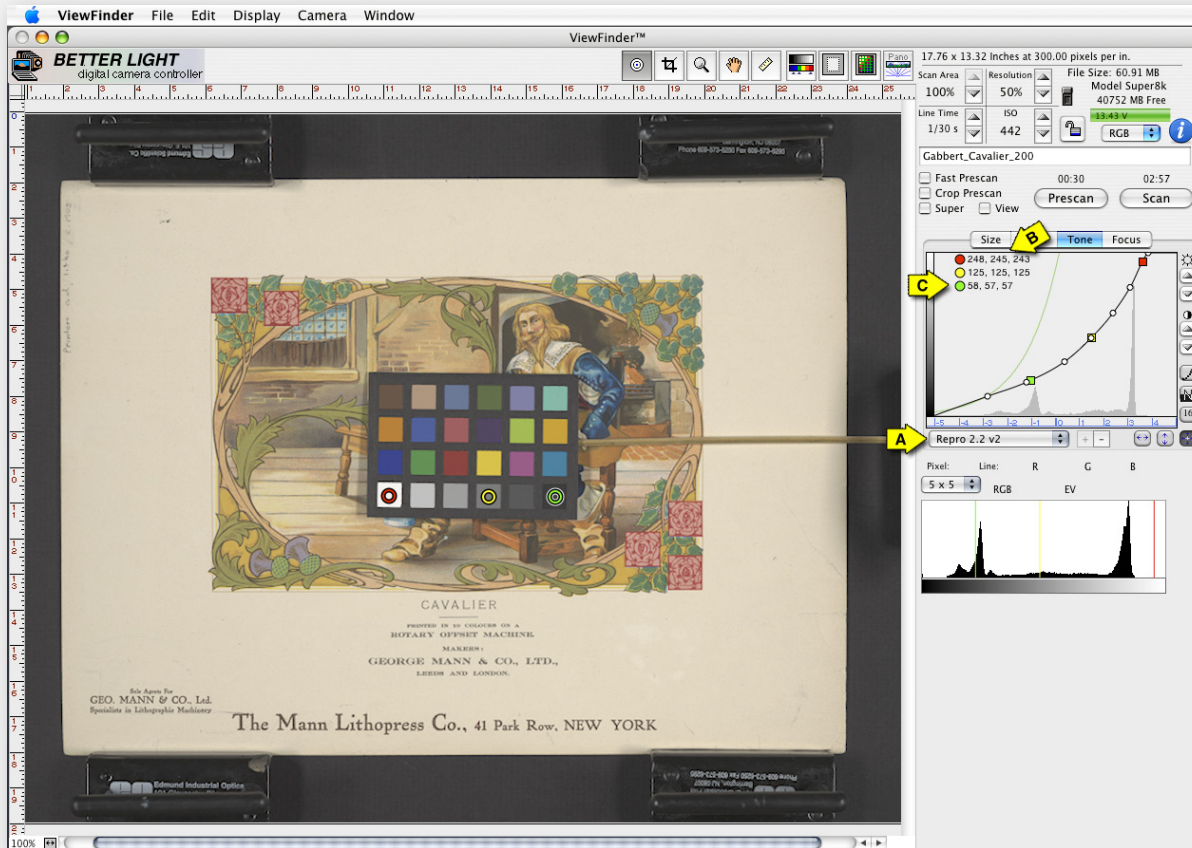
When you select a new curve, the ViewFinder software uses the revised settings to display a new Preview that simulates the results expected in the final scan.

## RELATED NOTES:

Better Light Tone Curves are a single line graph that gives you total control of the curve shape and the RGB pixel data to plot the exact translation of light levels (“raw” luminance data) into digital brightness data values. This sensitometric curve, with a shoulder, straight line, and toe – just like a film curve – gives the user full control of delicate highlight and shadow detail.



# CHANGING CONTRAST WITH TONE CURVES



## RELATED NOTES:

For your convenience while working in the Tone Tab panel, the RGB values of the areas that you selected with the “sticky spots” are displayed next to their specific colored circle. (Remember, the color circles are only for identification and are not representing red, yellow, green or blue of the color spectrum.)

The numbers shown to the right of each colored circle (C) represent the RGB values for RED (left), GREEN (center), and BLUE (right). The number we will watch most frequently is the CENTER Green value.

**What are the ideal RGB exposure values for the white point, black point and a midtone gray?**

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, etc.. However, for fine art reproduction, where the intent is to reproduce the original artwork as accurately possible, RGB target values can be specified.

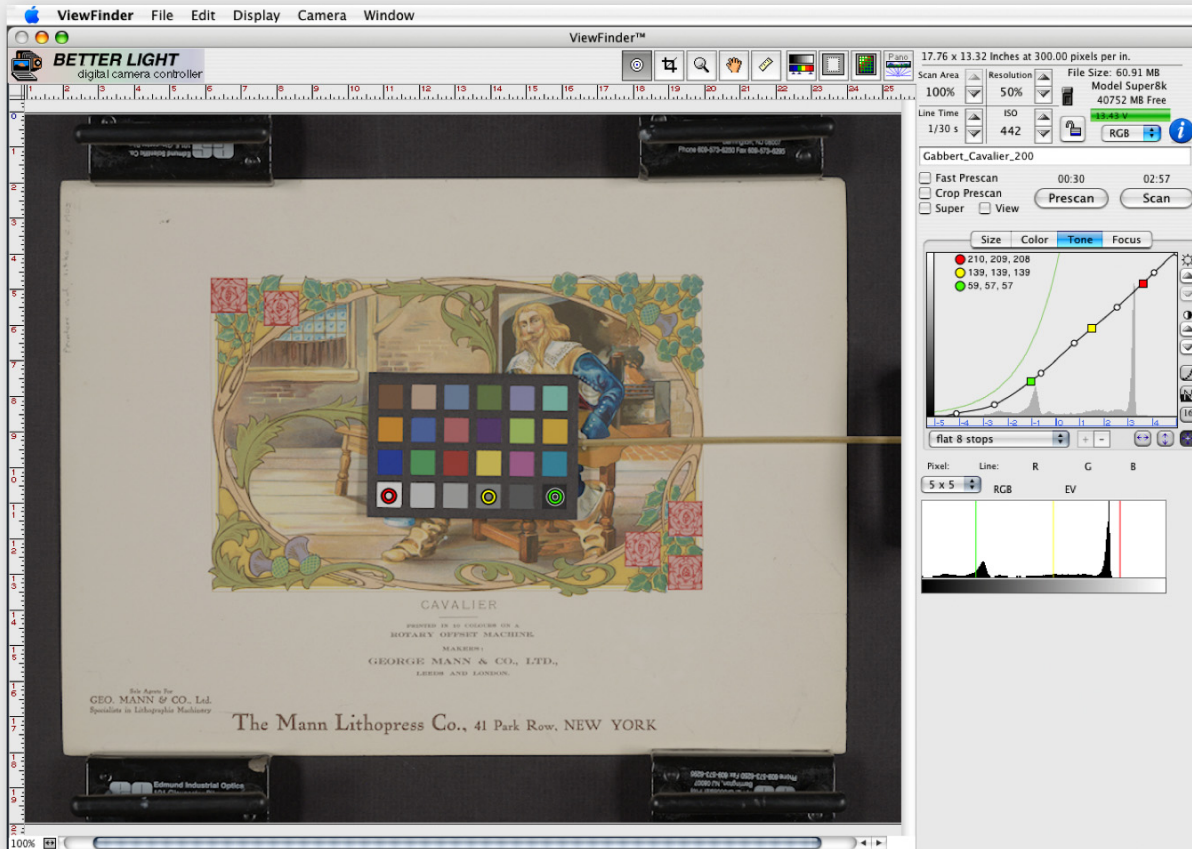
The **Repro 2.2** and **1.8** curves were designed for reproduction where the RGB values on a calibrated device (such as a ColorChecker™) will have a **direct correlation to the reflectances of the original items.**

Using the Repro curves will assure an accurate reproduction of the full tone scale and minimize the need and importance of making subjective decisions on tone based on the monitor preview. Since the exposure is made objectively by numeric values, the Repro curves can be used in a “by the numbers” reproduction situation.

For initial scanning of flat art subjects, **we will recommend use of the Repro 2.2 tone curve (A).** If you set the white exposure at 245 (B) the resulting digital file will be a very accurate digital reproduction of the original. As you experiment and gain more experience with ViewFinder tone curves, you can increase the overall contrast or make localized adjustments to the tone curve to improve results.



# CHANGING CONTRAST WITH TONE CURVES



As demonstrated in the next few slides, we suggest you **try a number of different Tone Curves** and see which one which makes the Preview image look the closest to the results you desire. **You may need to change your exposure settings** since a different curve may change the brightness of your image.

When switching the Tone Curve to **Flat 8 Stops**, it is easy to see that the entire image takes on a weak, gray cast — the whites have become darker, the colors are dull and the dark tones have become lighter, reducing the overall contrast of the image.

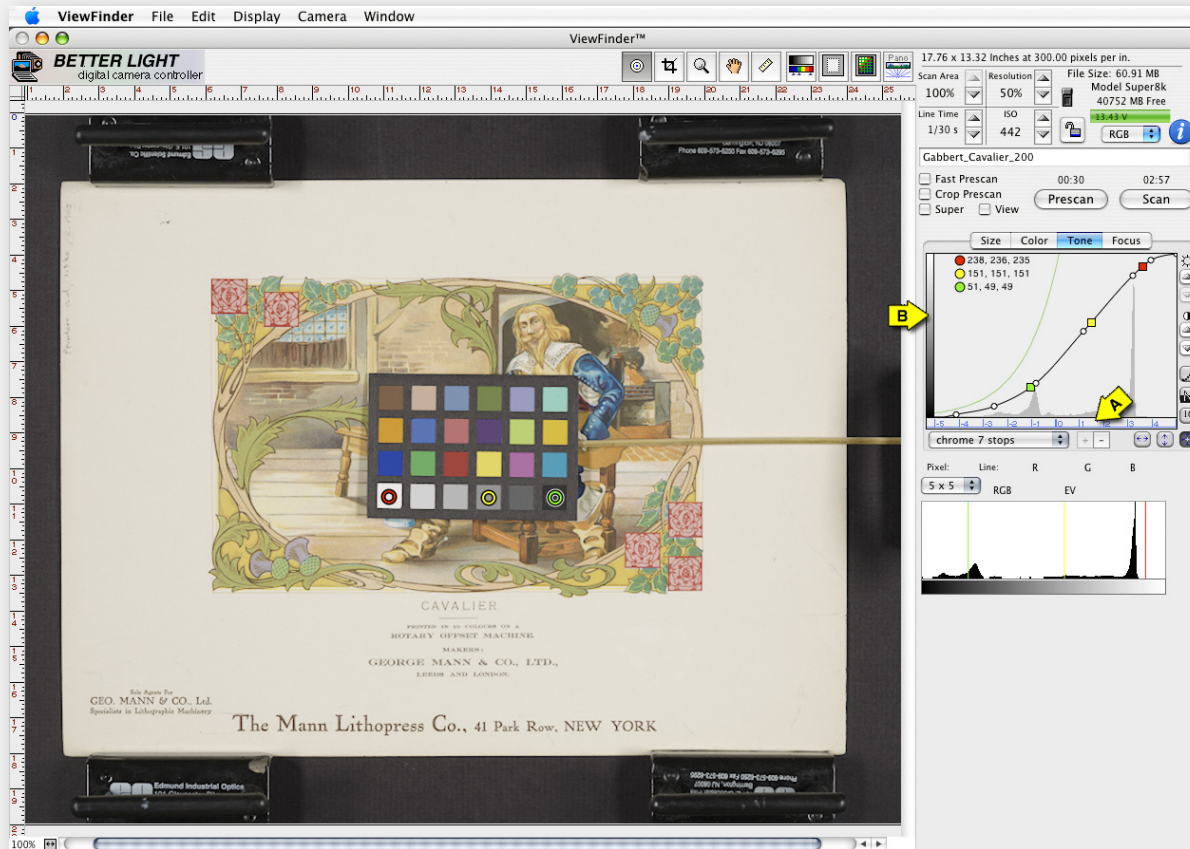
You can see that the curve is nearly a straight diagonal line from corner to corner, with only a slight bend at the bottom left to make the shadows a little bit darker. The range of tones from white to black is spread over 8 f-stops.

It is evident that this is not the right curve for this particular art and we should try another.

## FLAT 8 STOPS Tone Curve – Factory Objectives:

No specific photo application. Intended to be as linear as possible, producing a wide dynamic range spread evenly across data values. Retains detail in highlights and shadows of high contrast subjects. Good start for transparency film scanning.

# CHANGING CONTRAST WITH TONE CURVES



The **Chrome 7 Stops** curve is an improvement. The colors are improved and the drawing has more interest from the improving variation of tones reproduced in the image.

Note how the type stands out more than the previous *Flat 8* curve — the paper tone has gotten lighter and the black text is getting darker with the increase in contrast.

We can still do better than this.

**As we will see in the following slides, when the slant of the tone curve graph becomes more vertical the contrast and color saturation will increase.**

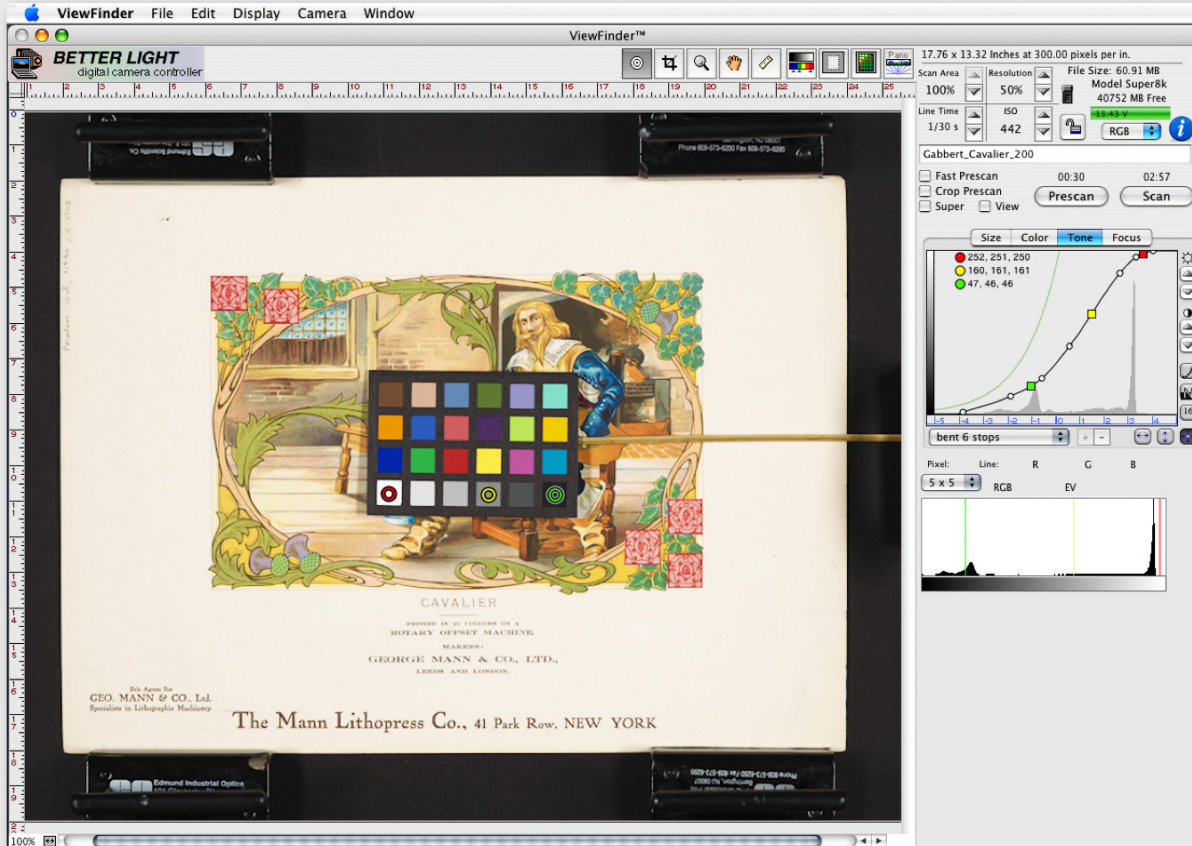
The horizontal scale (**A**) at the bottom of the tone curve window represents the amount of subject brightness (luminance) that the CCD sensor is recording. The EV (Exposure Value) number scale represents one f-stop increments or double the brightness of the previous mark.

The vertical grayscale (**B**) along the left side represents the reproduction “density” (tone) a particular brightness would become, based on it’s plotted point on the curve.

## CHROME 7 STOPS Tone Curve – Factory Objectives:

Similar to Ektachrome film that has been “pulled” (under processed), resulting in a long contrast range. Excellent for sunny outdoor scenes holding good detail in highlights and shadows. Darkened shadows to increase contrast and depth. Wide latitude gives a good margin of error; but with studio lighting produces flat, dull results with low saturation.

# CHANGING CONTRAST WITH TONE CURVES



This **Bent 6 Stops** curve is a popular “standard” curve since it reacts so much like film under studio lighting conditions.

Compared to the previous *Chrome 7 Stops* curve, the highlight (shoulder) portion of the curve has moved up making the whites compared to the midtones brighter and more saturated. The shadow (toe) portion is about the same, maintaining a low contrast range in the darker tones.

What we have seen in each of these tone curve options so far is a gradual increase in contrast and saturation, with a few other subtle variations as noted below the graphics.

Each curve will have brightness variations determined by the shape of the curve which changes the relationship of the luminance of the subject and the corresponding output tone value.

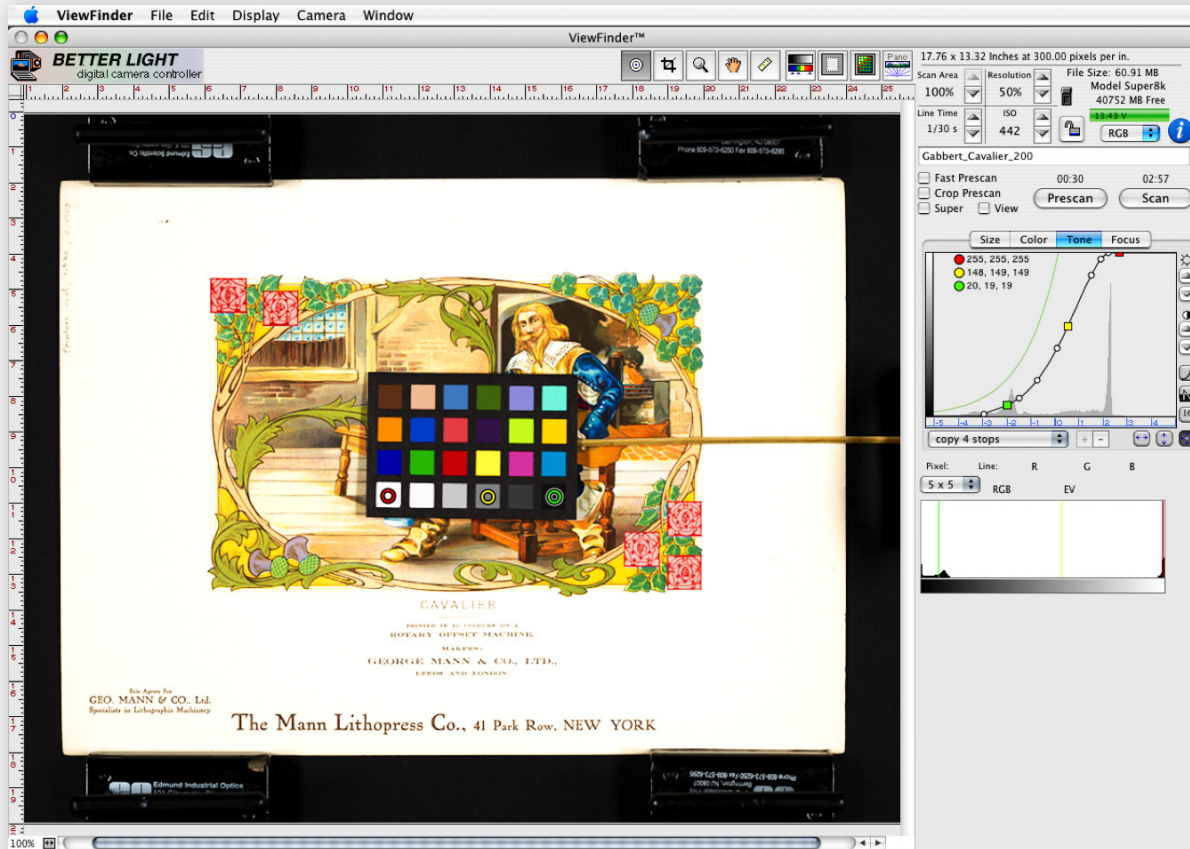
Obviously, this curve would require an adjustment to reduce the overall brightness of the image.

## **BENT 6 STOPS Tone Curve (same as DEFAULT Curve) – Factory Objectives:**

More color saturation than Chrome 6. Increased contrast between highlights and midtones; decreased contrast between midtones and shadows. Preferred for commercial photography applications, especially for high key, pastel and metallic subjects. Good definition between subtle tones, but some detail lost in shadows.



# CHANGING CONTRAST WITH TONE CURVES



Selecting the **Copy 4 Stops** simulates an image that has very vibrant colors, but has gone too far in contrast and has lost all paper detail.

The objective in selecting the “proper” tone curve is to get bright, clean highlights and rich dark tones...while maintaining the necessary detail. We don’t want to overexpose (“burn-out” or “blow-out”) the highlights, nor do we want the shadow detail to become so black that it loses detail (“plug-up” or “block-up”).

If you look back over the last few curves, you see that the curve becomes more vertical or “steeper” as the contrast increases. This makes smaller variations in subject brightness appear as larger variations of tone.

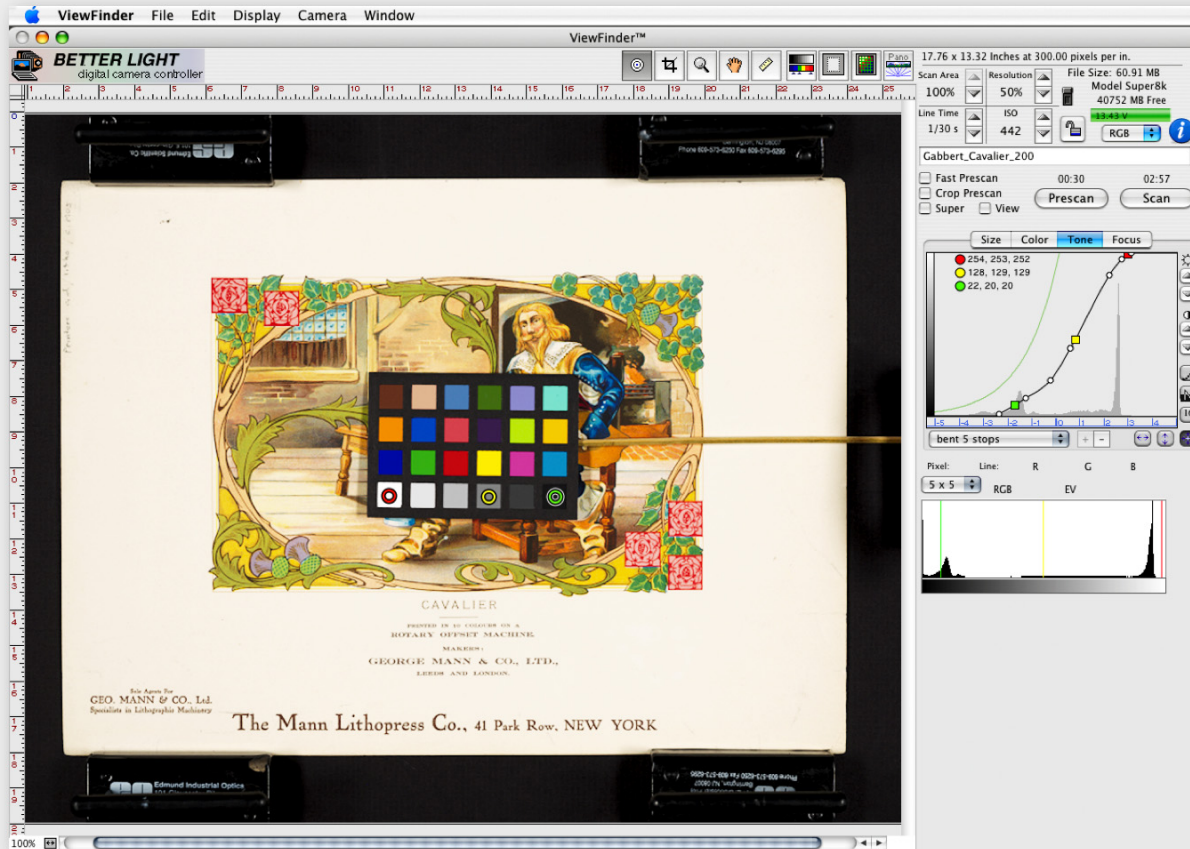
Comparing the lowest curve point on the left to the top right point on the curve, the distance extends across four marks on the EV scale. This represents a four f-stop density range...hence, the **Copy 4 Stop** name.

So, in this example, we want to go to a wider density range to reduce the contrast a little...let’s try the **Bent 5 Stop** curve.

## **COPY 4 STOPS** Tone Curve – Factory Objectives:

Intended for low contrast and high-key subjects. Excellent for copying of watercolor art and architectural renderings with subtle colors. The strong contrast curve brings out very small tone differences. Often helpful when text or line art needs to be darker while protecting light background tones.

# CHANGING CONTRAST WITH TONE CURVES



This **Bent 5 Stop** tone curve is the closest representation to the original artwork on the copy board. This “higher than average” contrast of the 5-stop curve, does a good job in capturing the vibrant solid colors as well as giving a strong black for the line art and type.

It is not important for your selection to be exactly accurate to the original...we will work on that later. The objective is to select the tone curve closest to the original to make the task easier.

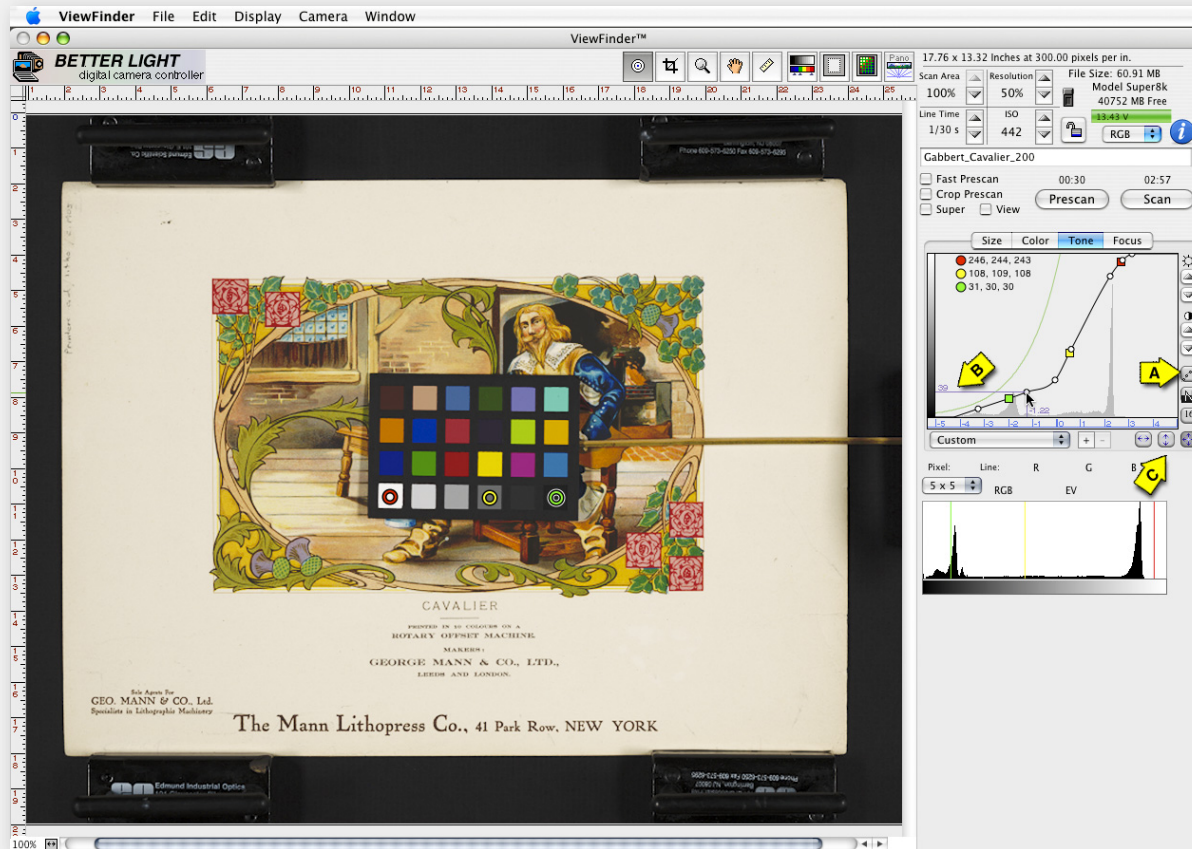
As you become comfortable with the results you attain, you will be able to create your own customized curve for your capture station and subject matter. This will increase the efficiency and repeatability of your work in the future.

**Now, we can continue to the steps to fine-tune the image prior to capture.**

## **BENT 5 STOPS Tone Curve – Factory Objectives:**

Higher contrast version of Bent 6. Increased contrast in highlights and shadows while maintaining good range in midtones. Try when subjects lack internal contrast or when dimensional subjects are illuminated by low contrast lighting.

# CHANGING CONTRAST WITH TONE CURVES



The easiest way to alter the tones of an image is to modify the shape of the curve, similar to the curves adjustments in Photoshop.

On the Tone curve you will see five or seven small circles at different points of the curve. (You can change the number of points with the button (A) on the right side of the Tone Curve panel.

Each of these circles can be moved along the curve. You will also note that the curve has colored squares that correspond to where the tone value of each "sticky meter" point is located.

**Starting with the *Bent 5 Stops* curve, we reduced the white value to about 245.** Now we want to change the density value (lightness or darkness) of the black patch to about 30. The green square (representing the black value) is between two handles on the curve, so both handles should move up to make the dark tones lighter.

Click on the circle handle and hold the mouse button down while you **MOVE THE CURVE UP** in small movements. First, move the bottom left handle up and to the left to extend the curve toe. Then move the circle on the right of the Green square **UP** to get the black to 30. You will see the cross hair indicates where on the grayscale the new black value is plotted (B).

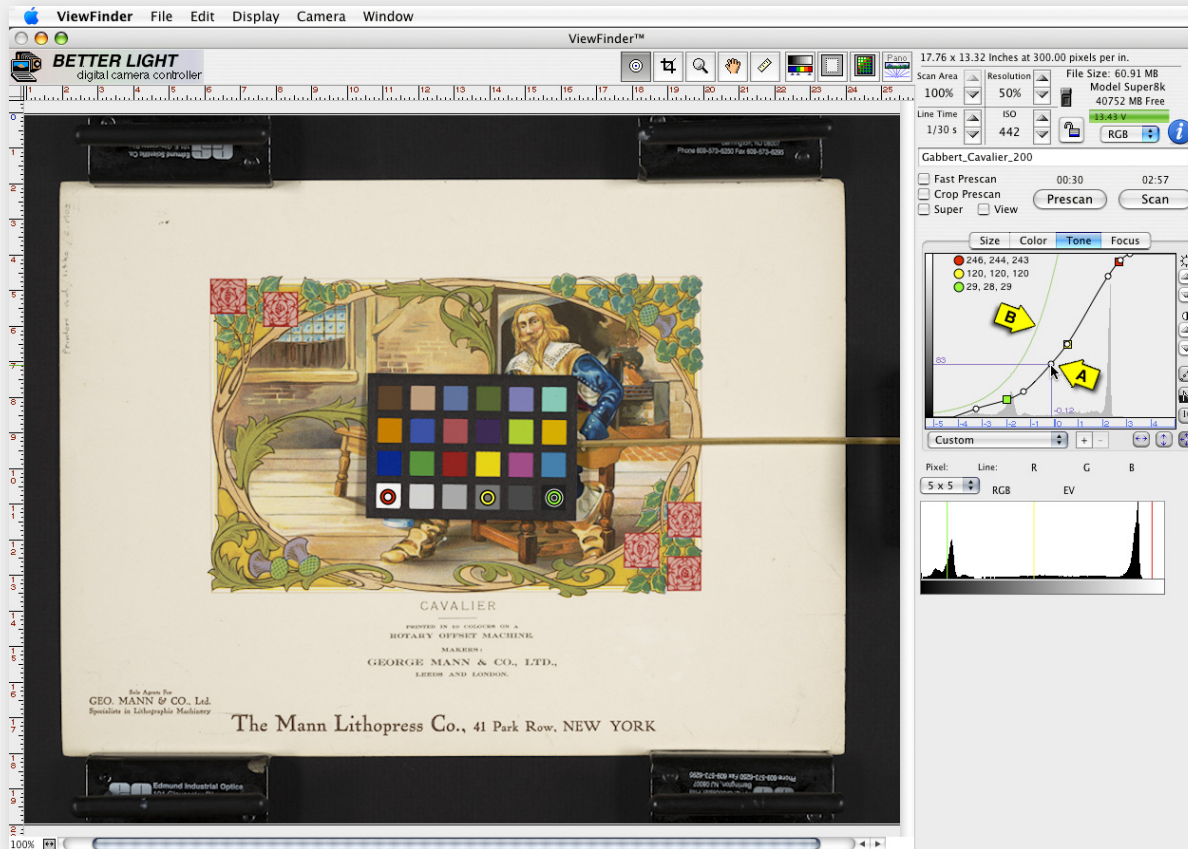
**Note that this move created a bend in the curve between the green and yellow squares.** We will correct this in the next slide.

## RELATED NOTES:

The three buttons at the bottom of the tone graph (C) control the range of manual adjustment allowed for the curve control points. The button on the right restricts each control point to horizontal movements (+- EV changes) only. The middle button restricts each point to vertical (+- output value changes) only. The left button allows full xy motion to the point. The control points cannot be moved to left or right, above or below the same position as their neighboring points. This helps prevent many mathematical problems in creating the curves.



# CHANGING CONTRAST WITH TONE CURVES



It is important to have the curve remain as smooth as possible without sharp bends or dips in the shape, such as that created by the previous move of the black (green square) value.

Click and drag the closest round “handle” (A) into the low area and nudge the curve up to make a smoother line. This move also lightens the midtones, improving the overall contrast range.

Avoiding bends in the curve will maintain a gradual transition of tones throughout the image and minimize any chance of posterization or banding.

Posterization occurs when an area of smooth color transition is rendered as an abrupt color change instead of a smooth, sequential transition. The resultant visual effect is that of an abrupt “step” or “banding” in the image.

Gradient banding is seen in a blue sky or solid background such as a seamless background that changes density gradually in the image. A poor tone curve shape could cause hard breaks, or “bands” of color over this area rather than a smooth transition from one tone to the next.

## RELATED NOTES:

**The LIMIT LINE** — On the left side of the tone graph is a curved green line (B) that never moves. This line represents the limit for conversion of the camera’s raw (14-bit) data into an 8-bit image file. If the Tone Curve is created or modified so part of the curve extends beyond (to the left) of this green line, some tone values may be skipped resulting in posterization or banding problems, especially in smooth tone transitions.

**If you wish to save your new curve** for future use, click the + icon (Mac) or go to “New Setting” on the Windows menu. Type a name to represent the curve function and the new curve will be added to the pop-up list.





# THE END

**You can work along with this tutorial** without the scanning back by using the prescan included in this tutorial's folder or on the web site ([prescan\\_Cavalier Artwork.tif](#)).

Open your ViewFinder application and hold the Option (Mac) or Alt (Windows) key down and click the Prescan button. A menu window will open to allow you to locate this prescan file on your hard drive. Select the file and click "Open".

The image will load into the ViewFinder preview window, just as it would with a camera-created prescan. All functions except Focus can be used to increase your understanding of the software. Color balance, Tone Curve adjustments, Tone Zones, Cropping, etc. can all be used in the same way as if working with a live scanning back setup.

