ASIVA®

Shift+Gain

Version 2.2

Plug-in for Adobe® Photoshop®

Windows® 2000/XP

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Chapter I
INSTALLATION AND
INTRODUCTION

INSTALLATION

Thank you for purchasing the Asiva® Shift+Gain Plug-in for Adobe® Photoshop®, developed by Shapiro Consulting Group, Inc. (SCGI). Please register the plug-in online at: **http://www.asiva.com/register/register_product.php?product=ShiftGain** to ensure you will receive e-mails regarding updates and other information.

1. Move or remove any older versions of the Shift+Gain Plug-in from Photoshop®'s Plug-Ins folder.
2. UnZip the downloaded archive file. A folder named Asiva Shift+Gain 2.2 will be created, along with the Asiva Shift+Gain 2.2 Documents folder.
3. Drag this folder into your Photoshop® Plug-Ins folder. Note the plug-in has been tested with Photoshop® versions 5.5 throughCS (8.0).
4. Read the enclosed Release Notes and License Agreement enclosed in the Asiva Shift+Gain 2.2 Documents folder.
5. You are now ready to run Photoshop and the Asiva® Shift+Gain Plug-in.

INTRODUCTION

The Asiva® Shift+Gain Plug-in runs within Adobe® Photoshop® 5.5 through CS (8.0), and can be opened by selecting "Asiva®" and "Shift+Gain" from the "Filter" menu. Currently, the plug-in works with RGB and CMYK, 8 or 16-bit/component images. Asiva® Shift+Gain always works internally in 16-bit per component, maximizing the bandwidth and precision of enhancements to your images. The plug-in works with one Photoshop layer at a time.

Within this plug-in, there are two separate *Filters*, or Operations: Shift and Gain. You use one of these Operations at a time. What is the basic difference between Shift and Gain? Shift means to add to, or subtract from a color component, like Red. Shifting the intensity component is like the brightness adjustment on a TV - everything in the image will get brighter or darker.   A Shift Operation will be performed on the pixels in a source image selected as the source color(s) by the *Maps*.

It is important you clearly understand the curves in the three Maps in this plug-in define the source color range you want to effect. How the curves are drawn in the three Maps will be explained in detail later.

Gain behaves quite differently from shift. Gain is really no more than multiplying or dividing a given color component by some real number, like 1.33. Gaining the intensity component is similar to a TV's contrast adjustment: If brighter values are represented by higher numbers and darker values are represented by low numbers, then multiplying by the same amount would impact the higher number more than the lower numbers. That is why it appears to increase the contrast - because the whites get whiter but the shadows stay almost the same.

In either case of the Shift or Gain Operation, you can modify 6 separate components for a RGB image or 7 for CMYK image. Shift and Gain perform two passes on an image. The first pass is on each component of red, green and blue or luminance and chrominance for RGB files; or cyan, magenta, yellow and black or luminance and chrominance for CMYK files. The second pass shifts or gains hue, saturation and intensity.

In the most general sense, if you want to impact high values of some component or channel but not low values, use gain. If you need to alter low values, typically to increase them, use shift. Because there are two separate passes and independent channel control coupled with precise curve settings, the types of corrections possible with the Asiva Shift+Gain in terms of color, saturation and light changes are vast. Chapter III has a number of examples to help you get started.

Note: The Shift and Gain Operations, or Filters, are mutually exclusive within the plug-in. You cannot Shifts and Gain at the same time.

The plug-in's dialog and the Operation Pop-up Menu, where you select either the Shift or Gain Operation, are shown in Figure 1.1.

Figure 1.1 Asiva® Shift+Gain Plug-in Dialog and Operation Pop-up Menu

We are sure you will find this plug-in's ability to control color and tonality changes well beyond anything you have seen before. Almost any filter operates globally on either the entire image, or globally within selected areas. Even within physical selections, filters will often affect the pixels in a similar manner, thus appearing to be overlaid on the image. Typically, the type of controls you have are slider controls along with, perhaps, a threshold level. The problem with making color changes in such a manner is, most images are non-linear with respect to their needs. That is, some pixels are fine as they are while others are grossly in need of serious adjustment. Upon careful inspection, you will notice it is quite often the color characteristics, not the physical objects, that determine what is needed. For example, take a look at the magenta color cast on the image in Figure 1.1.

The Asiva® Shift+Gain Plug-in does have the familiar slider controls where you set the Shift or Gain amounts individually for color components. These Shift or Gain amount sliders are located just below the Operation Pop-up Menu, and are available for RGB/CMYK and HSI.

Figure 1.2 Shift or Gain Sliders for the RGB color components.

For the Shift Operation, these sliders determine an amount to be added to or subtracted from each color component, as specified by the three ma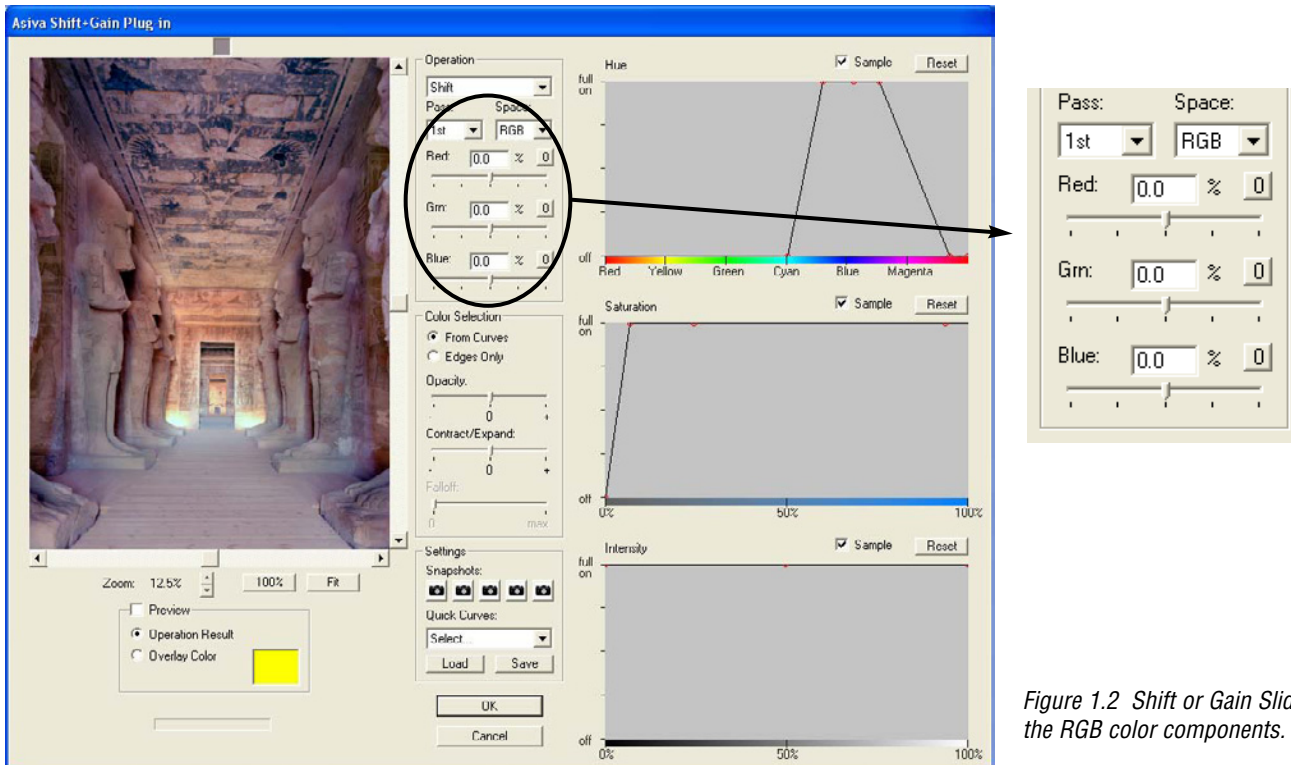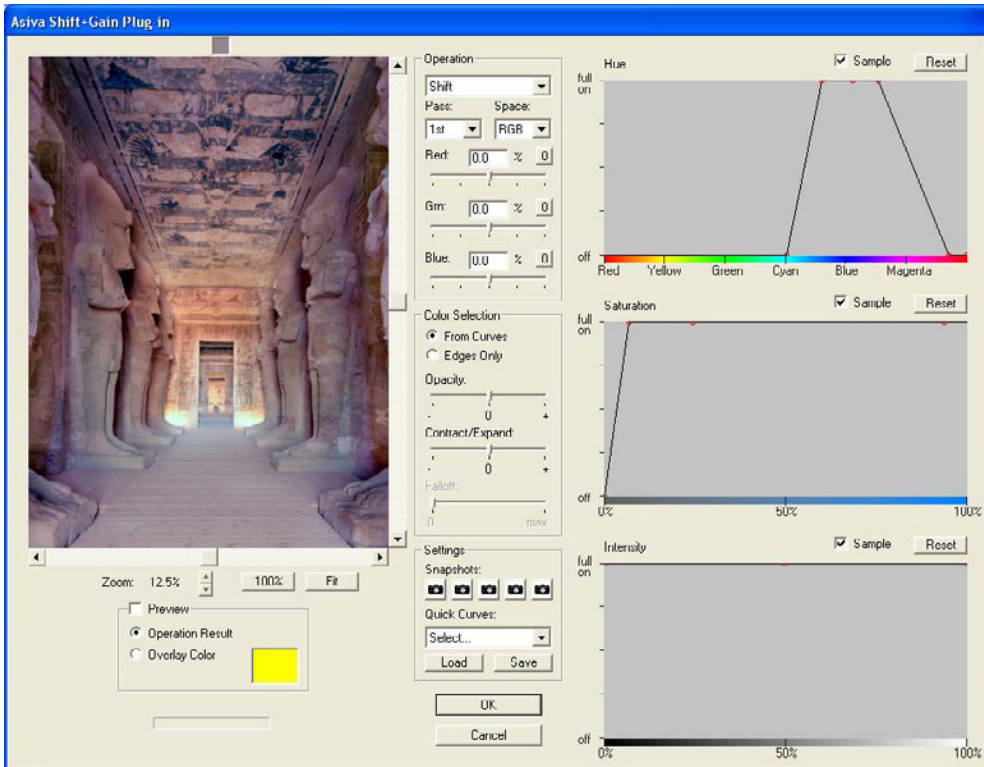ps. For Gain, the sliders determine a real number to multiply by or divide into each pixel's color components. The real power of the plug-in comes with how you draw curves in its three maps.

The Asiva® Shift+Gain Plug-in operates on the basis of patented technology, whereby shifting or gaining color components are controlled by user-adjustable maps. Asiva® Shift+Gain currently has three such maps, the Hue Map, Saturation Map and Intensity Map, shown in Figure 1.3.

As the true power of this plug-in comes from the manipulation of the Maps, it is essential you understand color models, in particular HSV or HSI. If you are unfamiliar with these terms, please download and read the Asiva Color Manual, available from our website at asiva.com.

The shift or gain amounts you can apply to the individual color components of an image are highly variable and continuous, meaning transitions between levels are smooth and natural-looking. For example, you could shift the red component up only in flesh tones, adding more red in the highlights than in the shadows, and more red in the unsaturated flesh tones than the saturated tones.

The concept of operating based upon color and color variations as opposed to physical areas in an image may seem foreign to many users. However, once you get the hang of it, you will find it efficient and intuitive. This does not prohibit you from making selections in Photoshop. Just be aware it is NOT necessary to be so careful with selections. That is, drawing carefully around

Figure 1.3 Hue, Saturation, and Intensity Map.

a physical area or areas in an image. Thoughtful adjustments of the plug-in's Maps usually allow for 'sloppy' physical selection(s) in Photoshop. This is due to the fact that the Maps ARE making selections for you, however they are based upon the color properties of the pixels.

Mastering Asiva® Shift+Gain Plug-in's three maps, Hue, Saturation and Intensity, are key to understanding how to use the plug-in effectively. Figure 1.4 shows one of the plug-in's three maps, the Intensity Map, located on the right, bottom of the dialog.

The horizontal axis of this map represents brightness values, from darkest to lightest, left to right. Note the strip on the bottom of the Intensity Map actually shows the range of the intensity component. The intensity range is shown by percentages, from 0% to 100%. The vertical axis adjusts the amounts of color correction or application to perform, with "off" meaning 'do no color correction or application', and "Full on" meaning 'perform the full amount of color correction or color application'. Values in between are relative Shift or Gain amounts.
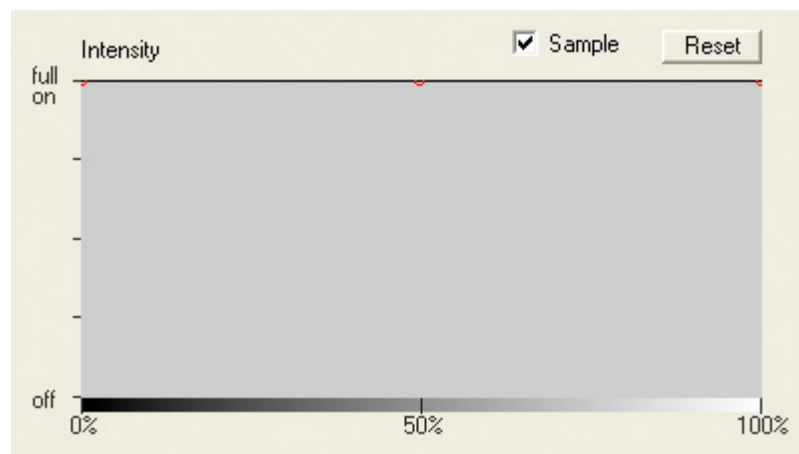

Figure 1.4 Asiva® Shift+Gain Intensity Map.

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This map tells the plug-in how to Shift or Gain over the entire 16-bit intensity range, all 65,536 of them. Note the line drawn at the very top of the map, IS our curve and tells the plug-in to Shift or Gain to the maximum amount, for all intensity percentages.

Think of each of the three maps like a graphic equalizer for a 3 channel stereo system. Figure 1.5 shows a single-channel, 31 band equalizer, with vertical slider controls at set frequencies. By analogy, the Asiva® Shift+Gain Maps give you **three** 65,536 band equalizers, where the control sliders are not fixed at set intervals. You can set the curves in the maps in any manner you see fit, allowing for millions of possible settings. Figure 1.6 shows one of many possible settings for the Intensity Map.

Figure 1.5 A single-channel, 31 band audio graphic equalizer.

The Relationship of the Maps

It is important to note the three maps within the plug-in are related. For example, the 'curve' shown in the Intensity Map of Figure 1.4, is a straight line at "Full on" for all intensities. As discussed, this setting would indicate to Asiva® Shift+Gain, the intensity component for all pixels should be shifted or gained the same amount.

It is actually the intensity component of all pixels <u>as specified by the Hue and the Saturation Maps</u> that would be shifted or gained. Chapter II will go into greater detail about how the maps are related, and discuss the remaining Asiva® Shift+Gain Plug-in components.

Figure 1.6 A possible setting for the Intensity Map control.

Chapter II
ASIVA® Shift+Gain PLUG-IN COMPONENTS

ASIVA® SHIFT+GAIN PLUG-IN COMPONENTS

This chapter describes the components of the Asiva® Shift+Gain Plug-in. By components, it is meant: the Image Pane or preview area, pop-up menus, checkboxes, up & down arrows, sliders, maps, and buttons found within the plug-in's dialog.

Asiva® Shift+Gain Plug-in Dialog

Figure 2.1 Asiva® Shift+Gain Dialog.

Let's look at the plug-in's dialog first and then we will describe in detail each of the components. Figure 2.1 shows the Asiva® Shift+Gain Plug-in dialog, displayed when "Asiva®" then "Shift+Gain" is selected from Photoshop®'s "Filter" menu.

Cursors

While moving your mouse around the dialog, you may see up to five different cursors. They are the Arrow Cursor, the Color Sampler Cursor, the Pan Cursor, the Crosshair Cursor and the Watch Cursor. The Arrow Cursor will likely be displayed more often than the others. Figure 2.2 shows the five different cursors.

Figure 2.2 Asiva® Shift+Gain Plug-in cursors; Arrow, Color Sampler, Hand, Crosshair and Watch.

The Arrow Cursor

Whenever the cursor is over any area other than the Image Pane or Maps, the arrow cursor will appear.

The Color Sampler Cursor

Whenever the cursor is over the Image Pane, on the left side of the dialog, the cursor will always change to the Color Sampler. The exclusive purpose of the Color Sampler Cursor is to help you 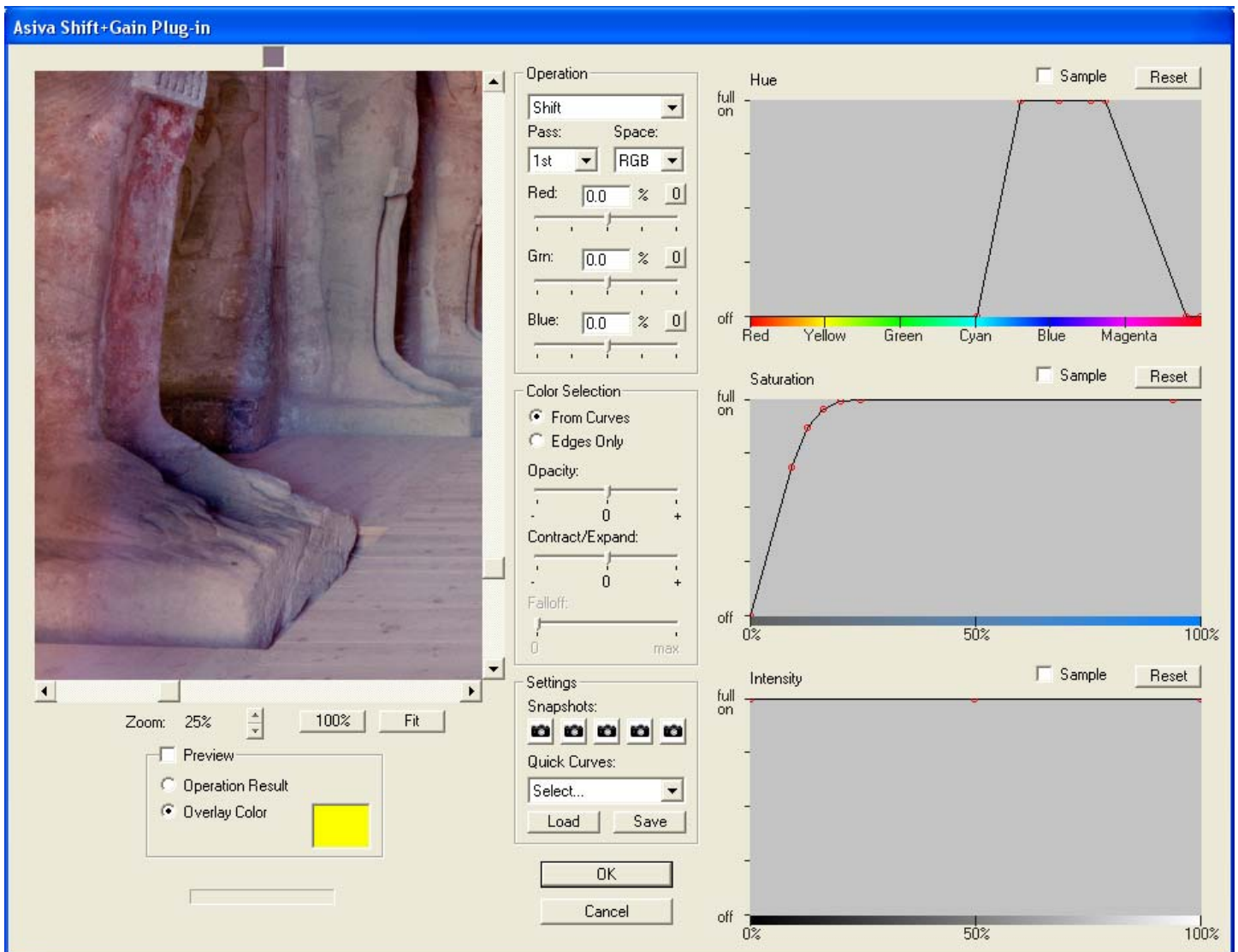set the Hue, Saturation and Intensity Maps. If color sampling is enabled on the checkbox above each map, clicking in the Image Pane or clicking and dragging a rectangle will sample the range of hue, saturation, and intensities in that area and reflect those ranges on the corresponding Maps. All values you have selected will be set to "full on" in the Maps, and all others will be set to "off".

Important Note: If the Preview Checkbox is enabled, using the Color Sampler Cursor will sample the rendered, or filtered version of the image. For this reason, the Preview Checkbox should be disabled when sampling in the Image Pane with the Color Sampler Cursor.

The Hand Cursor

Whenever the cursor is over the Image Pane, on the left side of the dialog, the cursor will change to the Hand when the spacebar is pressed. This cursor allows you to pan around the image.

The Crosshair Cursor

When the cursor is within one of the three maps found on the right side of the Asiva® Shift+Gain dialog, it will appear as a crosshair. You interact with the Maps by creating or moving points that lie on a curve within the Maps.

The Watch Cursor

The Watch Cursor can appear at anytime, regardless of physical positioning in the dialog, when a lengthy process is occurring. The most common lengthy process is rendering the image when you change any of the plug-in's parameters, with the Preview Checkbox enabled. Navigating around the Image Pane with the scroll bars may cause the watch cursor to appear as well. When the process is complete, the cursor will change back from the Watch Cursor to whatever it was before, either Arrow, Color Sampler, Hand or Crosshair.

Figure 2.3 Important Color Information areas within the Shift+Gain Dialog.

The Image Pane, Color and Map Information

Whenever the Color Sampler Cursor is moving over the Image Pane, the color information is displayed in a number of locations. Figure 2.3 shows the Color Sampler Cursor near the base of one of the Egyptian statues. Color information for the pixel below the tip is displayed in a rectangular area above the Image Pane in three ways: as RGB/CMYK component percentages, as a color swatch, and as HSI component values.

Perhaps more importantly, small triangles are positioned on the bottoms of each of the three Maps. The triangles are placed at the exact color component values of the pixel below the Color Sampler Cursor's tip. The triangles may assist you with pixels you are having trouble effecting properly.

Both the color information at the top of the Image Pane and the Map triangles are constantly updated as the Color Sampler Cursor moves around in the Image Pane.

Color Information

Provides RGB or CMYK component percentages and HSI color information, when the cursor is anywhere in the Image Pane. A color swatch is located in the middle.

Zoom Control

Image Pane

Scroll Bars

Zoom Preset Buttons

Figure 2.4 Image Pane and nearby controls.

The Image Pane

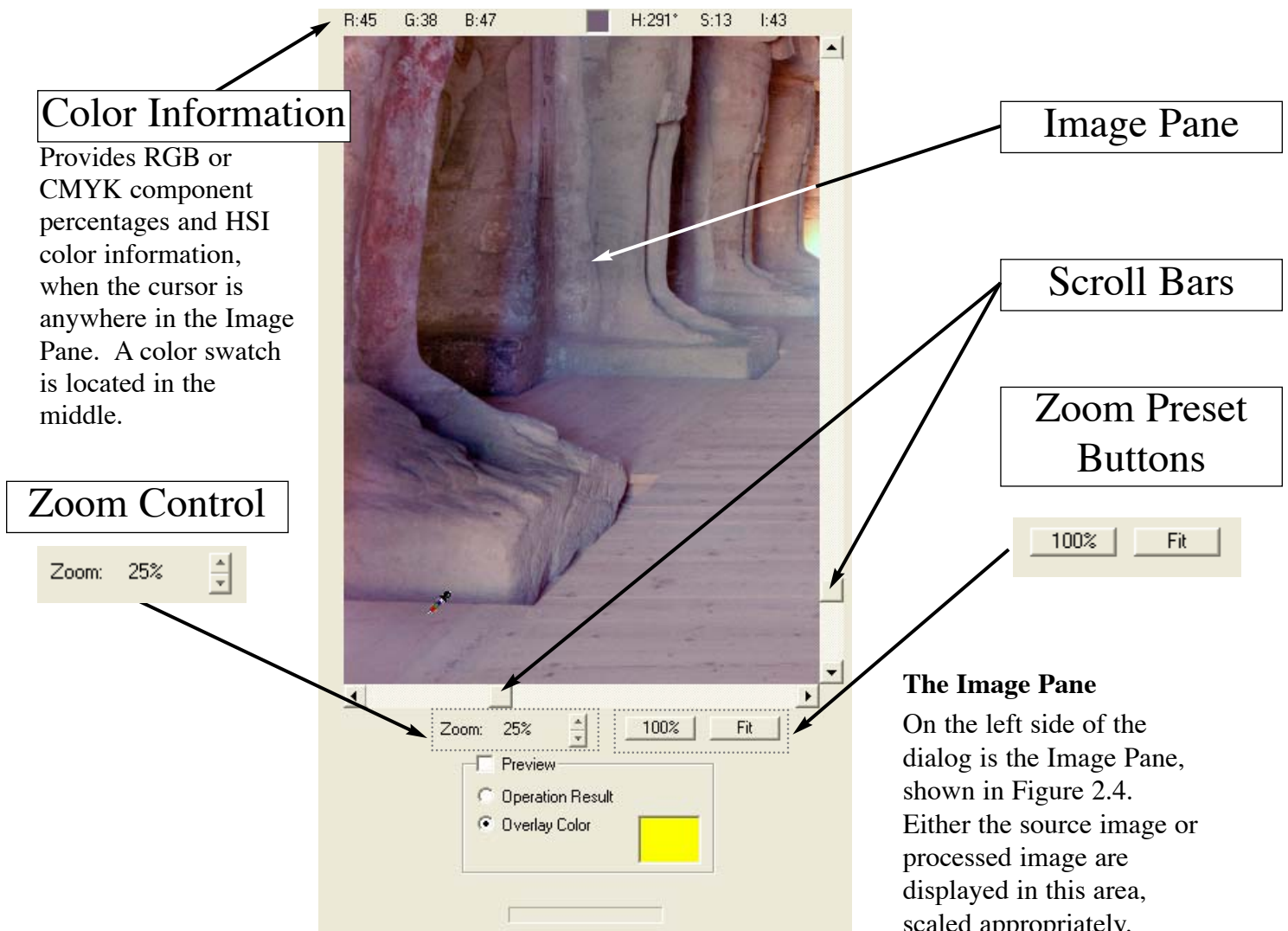On the left side of the dialog is the Image Pane, shown in Figure 2.4. Either the source image or processed image are displayed in this area, scaled appropriately. This area is a fixed aspect ratio and initially the image will be scaled, such that either the width or height fits perfectly, unless the image pane is larger than the actual image. Horizontal and/or vertical scroll bars will be active as needed.

The Zoom Control and Scroll Bars

Navigation within the image window is accomplished by the Zoom Control, Scroll Bars and the Hand Cursor. The Zoom Control is located immediately below the Image Pane on the left side. Figure 2.4 shows a detail of the Zoom Control parts. Text is displayed for the current scale of the image in the Image Pane area, as a percentage of the full-sized image. The small up and down arrows to the right of the zoom percentage amount display, control the zoom in or zoom out amounts. It is highly recommended you always look at the image at 100% at some point in the process, to truly see the Shift or Gain effects.

The Zoom Preset Buttons

The Zoom Preset Buttons are for convenience so you do not have to constantly zoom in or zoom out to get to two specific views: The 100% Button shows the image at "Actual Pixels" and the Fit Button will show the entire image in the Image Pane, possibly with gray space.

R:45   G:38   B:47   H:291°   S:13   I:43

Preview Checkbox

☐ Preview

Render Display Choices

○ Operation Result
◉ Overlay Color

Zoom: 25%   100%   Fit

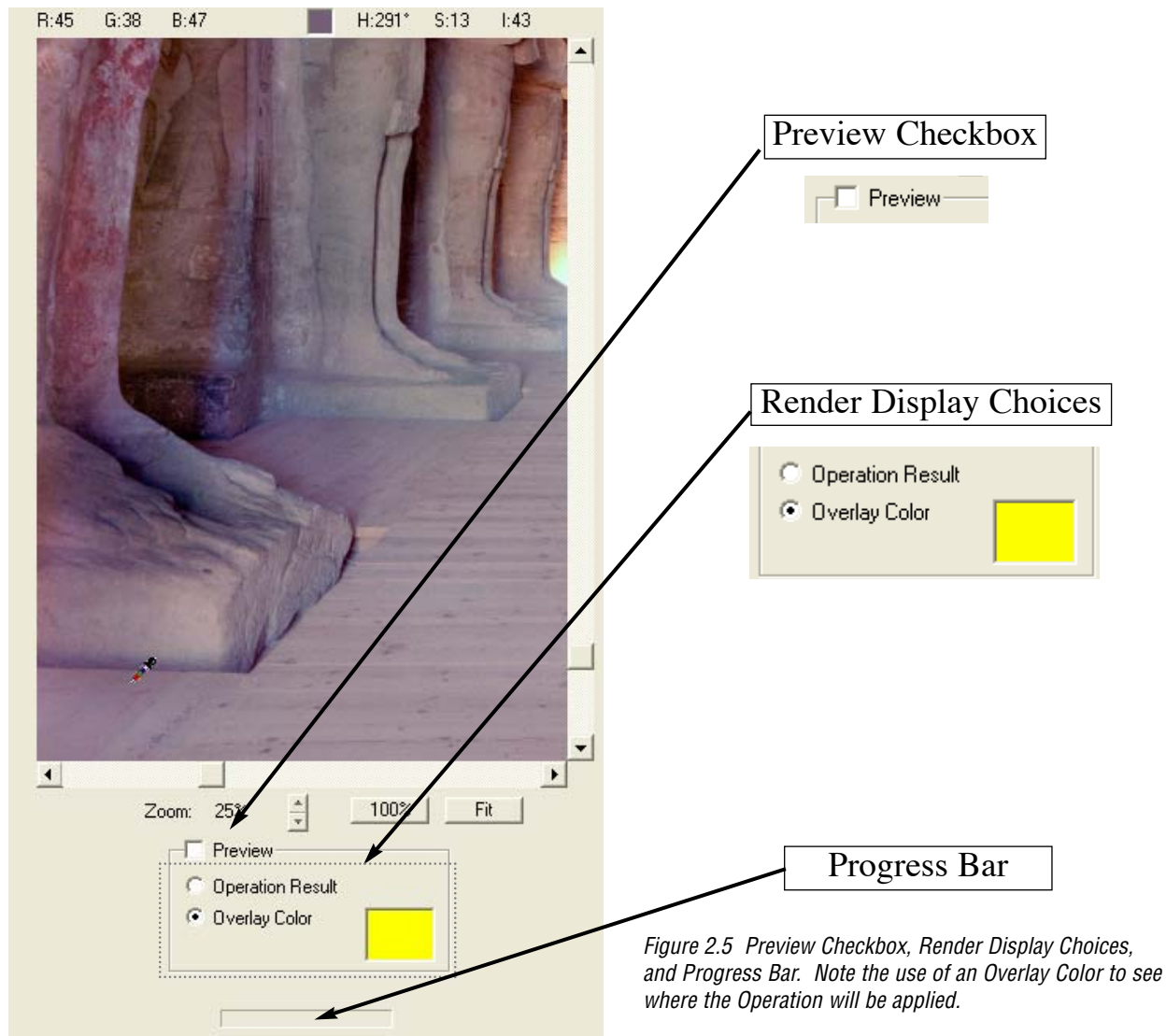☐ Preview
○ Operation Result
◉ Overlay Color

Progress Bar

Figure 2.5 Preview Checkbox, Render Display Choices, and Progress Bar. Note the use of an Overlay Color to see where the Operation will be applied.

The Preview Checkbox

Below the Image Pane Zoom Controls is the Preview Checkbox. Enable this checkbox to display the results of filtering, or rendering, the image with Asiva® Shift+Gain's current parameters, or an overlay of a user-defined color (specified by the Render Display Choices radio buttons below the Preview Checkbox). Toggling this checkbox allows you to compare the source and rendered versions of the image.

Note: If the Preview Checkbox is selected, any change to other controls will result in the image having to be re-rendered. You may want to disable it if you are working a large image and do not require refreshing the image each time you modify one of the controls, such as the maps.

Render Display Choices

When the Preview Checkbox is selected, the Render Display Choices define how the rendered version of the image will appear in the Image Pane. These radio buttons are active whether or not the Preview Checkbox is selected, so you may change to/from the "Operation Results" choice from/to "Overlay Color".

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If "Operation Results" is the current choice and the Preview Checkbox is selected, then the results of shifting or gaining color components will be displayed in the Image Pane.

Sometimes the results of an Operation are subtle and you really cannot tell exactly where the Operation is 'hitting'. Use the "Overlay Color" radio button in these instances. Click on the adjacent color swatch to modify the Overlay Color. When "Overlay Color" is the current choice and the Preview Checkbox is selected, then the specified color will be placed everywhere the source image will be effected by the current Operation. As your Asiva curves taper-off, so will the overlay color on the respective pixels' color values. See Figure 2.5.

The Progress Bar

As renders or translations may take some time, the plug-in contains a Progress Bar. The Progress Bar will graphically display the progress of rendering and/or reading, translating, and placing the image in the Image Pane. In addition, text information may be shown above the Progress Bar.
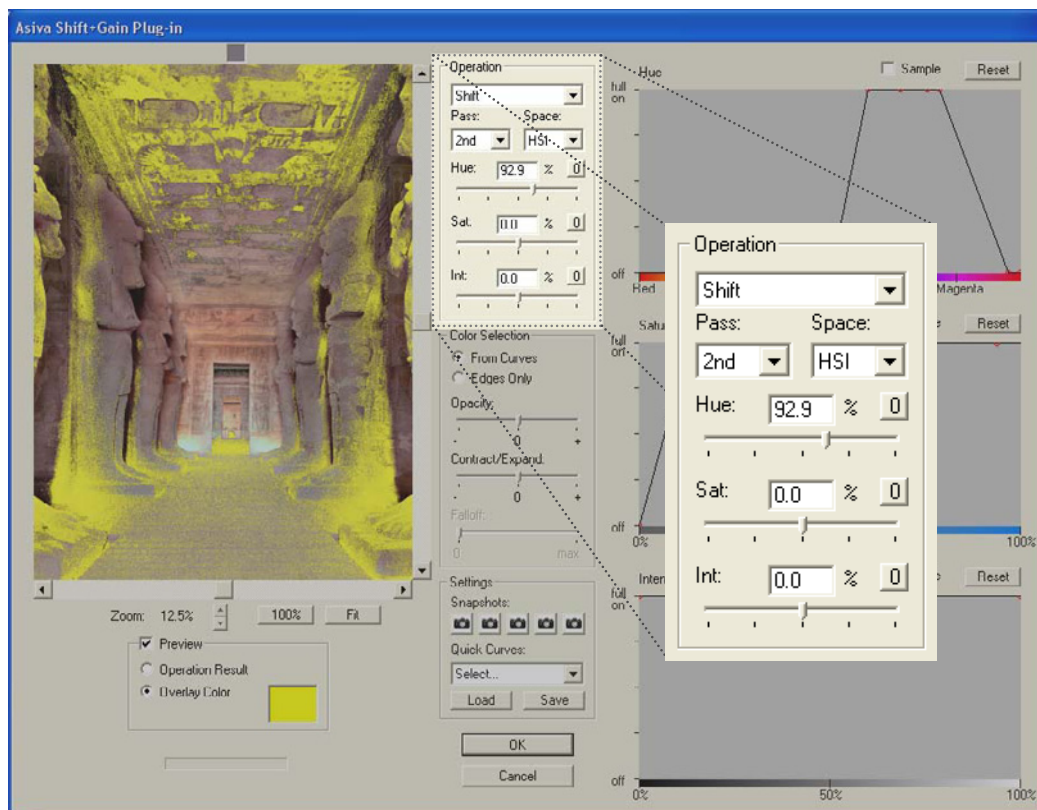

Figure 2.6 The Operation Group Controls for the Shift Operation.

The Operation Group for Shift

The top center area of the Asiva® Shift+Gain Plug-in, contains the Operation Group Controls. Figure 2.6 shows five of the controls found in this area for the Shift Operation.

The Operation Pop-up Menu

The Operation Pop-up Menu is the first control in the Operation Group. It allows you to pick either the Shift or Gain Operation. Changing the Operation type from Shift to Gain will alter the behavior of the color component sliders found below the Operation Pop-up Menu. The Gain controls will be discussed later. If the Preview Checkbox is enabled and you change the Operation type, the image in the Image Pane area will be rendered in the appropriate manner.

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The Pass Pop-up Menu for Shift

The second control found in the Operation Group is the Pass Pop-up Menu, and it appears for both Shift and Gain. This control allows you to reveal the color space and its color component adjustment sliders for each of the two passes performed. Remember that Shift+Gain performs two passes: the first shifting or gaining RGB/CMYK or YUV color components; and the second pass shifting or gaining HSI color components. Choose 1st from the Pass Pop-up Menu to reveal the RGB/CMYK or YUV slider controls, depending upon the Color Space you choose in the Color Space Pop-up Menu.

The Color Space Pop-up Menu and Component Sliders for Shift

The next control found in the Operation Group is the Color Space Pop-up Menu, and it appears for both Shift and Gain. This control allows you to reveal the color component adjustment
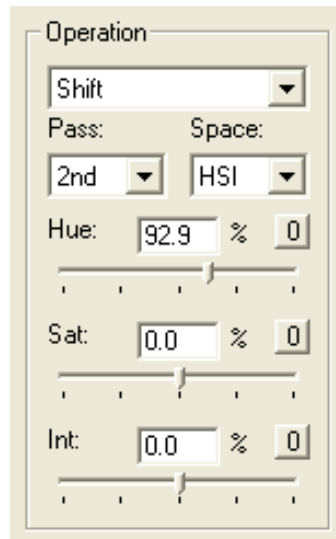

Figure 2.7 Detail of the Operation Group Controls for the Shift Operation.

sliders for RGB/CMYK or YUV for pass one and the HSI color component adjustment sliders for pass two. Figure 2.6 includes a closeup of the hue, saturation and Intensity slider controls for the Shift Operation, 2nd rendering Pass. Change the Pass Pop-up Menu to 1st in order to choose either RGB/CMYK or YUV from the Color Space Pop-up Menu and reveal the appropriate color component sliders.

Above each color component slider is a text box where you may enter a value yourself, Make sure you hit the <return> key when finished entering text.

Also note the small buttons labeled with a "0" on the right side of each slider. Clicking on any of these will reset the respective slider to 0. For the Shift Operation, that would indicate not to make any change to that color component.
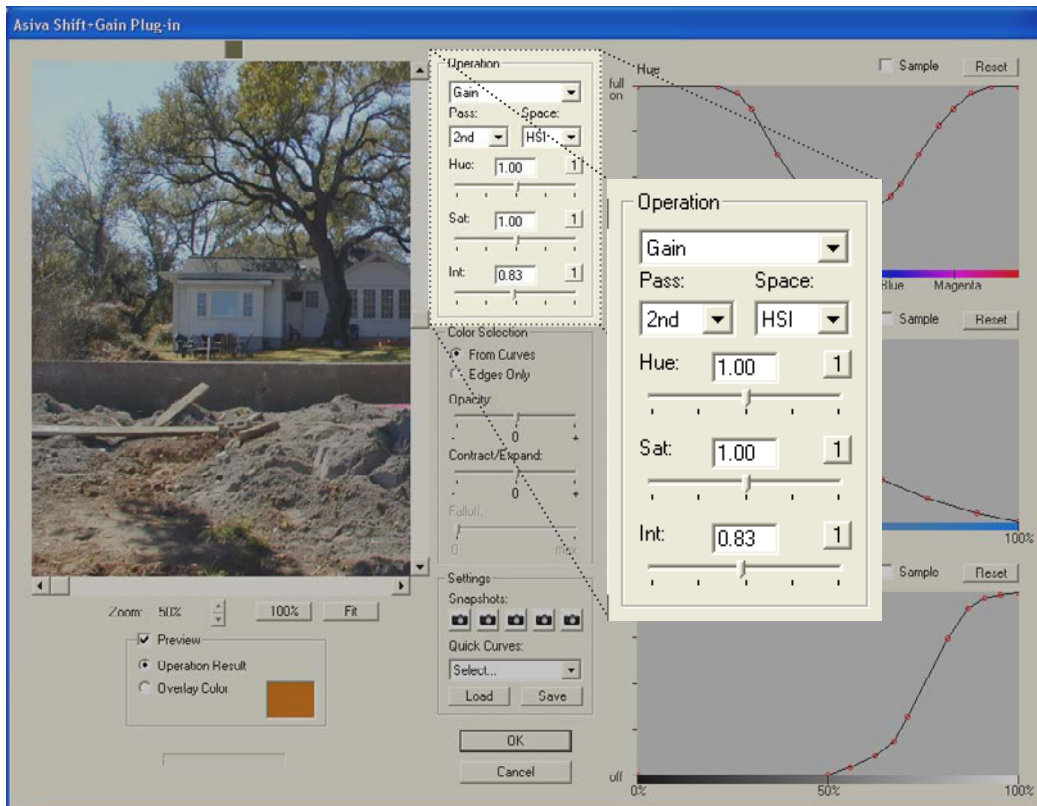
Figure 2.8 The Asiva® Shift+Gain Dialog and Operation Group Controls for the Gain Operation.

The Operation Group for Gain

The color component sliders change when Gain is selected in the Operation Pop-up menu, to handle values that will be multiplied. Figure 2.8 shows the HSI sliders for the Gain Operation.

The Color Space Pop-up Menu and Component Sliders for Gain

Just like Shift, the second control found in the Operation Group is the Pass Pop-up Menu. This control allows you to show the color space for that pass, and the color space's color component sliders.

The next control is the Color Space Pop-up Menu. This control allows you to reveal the color component gain adjustment sliders for RGB/CMYK or YUV, and HSI depending upon the pass. Again, recall that Shift+Gain performs two passes: the first shifting or gaining red, green, and blue or cyan, magenta, yellow, and black or luminance and chrominance; and the second pass shifting or gaining hue, saturation, and intensity. Figure 2.8 includes a closeup of the HSI sliders for the Gain Operation, 2nd pass. In the Gain settings above, note that we are only changing the Intensity component since the Hue and Saturation Sliders are at 1.0. That is because the Operation is a Gain (multiply) and 1.0 times anything equals itself.

Above each color component slider is a text box where you may enter a value yourself, Make sure you hit the <return> key when finished entering text.

Also note the small buttons labeled with a "1" on the right side of each slider. Clicking on any of these will reset the respective slider to 1.0. For the Gain Operation, that would indicate not to make any change to the respective color component.
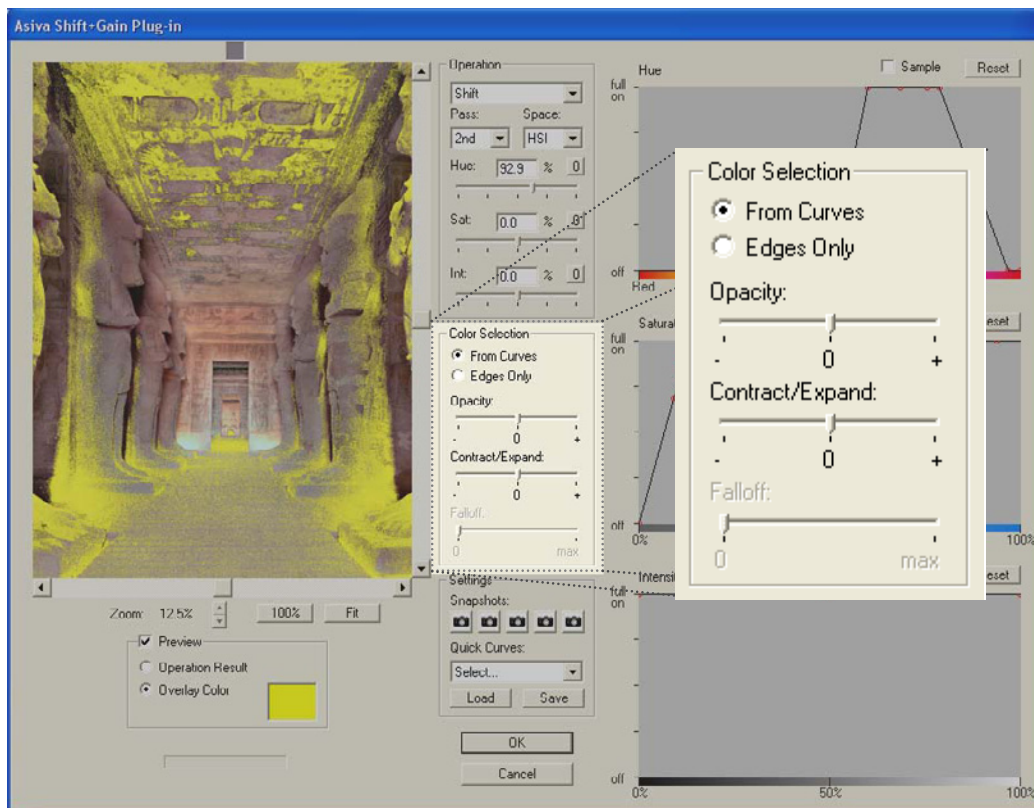
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Figure 2.9 Asiva® Shift+Gain Color Selection Controls.

The Color Selection Group

The middle center area of the Asiva® Shift+Gain Plug-in, contains the Color Selection Group Controls. Figure 2.9 shows the five controls in this area.

The From Curves or Edges Only Radio Buttons

If you choose "From Curves", the current Operation will occur on every pixel specified by its color component values found in the Maps, to the degree your curves indicate. This means an Operation will stay inside and up to the color boundaries that are selected. "From Curves" is the default choice and the one you would normally use.

An "Edges Only" choice will select the colors defined by the Maps, however only on the edge boundaries of the selected pixels. Edge boundaries means just inside of and just outside of the selected colors. You would choose "Edges Only" if, for example, you only want to effect the edge boundary of a selected color or colors.

The Opacity Slider

The Opacity Slider effects the relative strength of a color-based selection, up to a maximum of "Full on" or conversely down to a minimum of "off". Moving this slider to the left will reduce the strength and moving it to the right will increase it. With the Preview on and Overlay Color selected, you can see the results of changing the Opacity Slider's value.
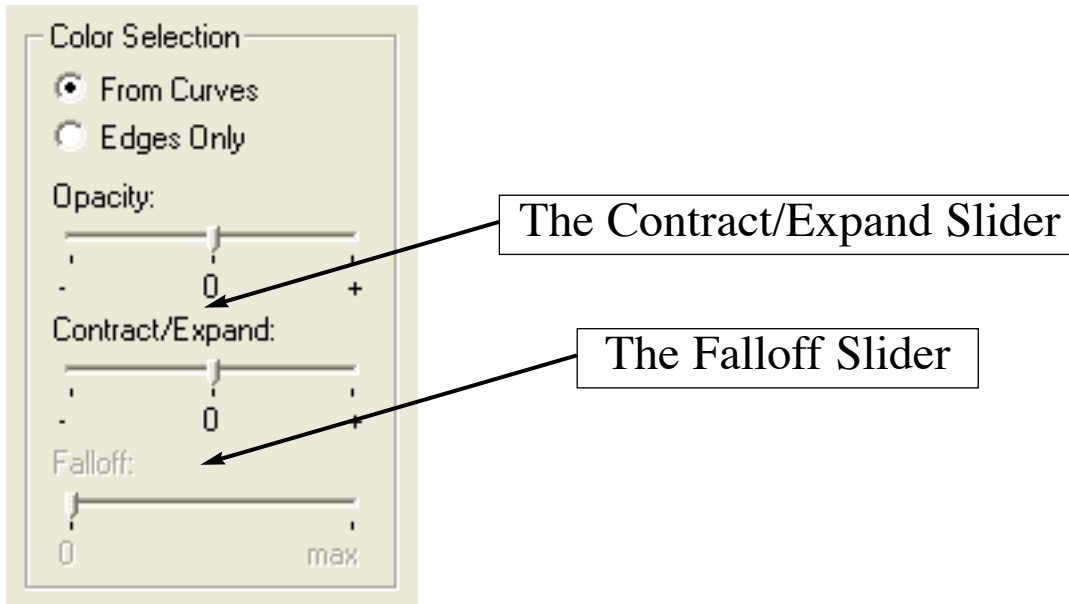
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Figure 2.10 The Contract/Expand and Falloff Sliders.

The Contract/Expand Slider

This slider applies equally to color selections from the curves in the Maps or their edge boundaries only. The Contract/Expand Slider allows the pixels selected to physically expand or contract to or from adjacent pixels, in all directions. Moving the slider to the right will expand the selected pixels and moving it to the left will contract the selected pixels. Again, the easiest way to see the Contract/Expand Slider's effect is to turn Preview mode on using Overlay Color. Its default value in the center indicates no contraction or expansion.

The Falloff Slider

The Falloff Slider is directly related to the Contract/Expand Slider, and is enabled only if a color selection has been contracted or expanded. This slider determines a falloff selection strength of the expanded or contracted selected pixels. Its default position is all the way to the left, meaning no falloff. Moving the slider towards the right will increase the falloff to a maximum, which really means "make the expanded or contracted selection area reduce all the way down to no selection on its boundaries.

The best way to understand the Falloff Slider's behavior is to experiment with it. Of course, you should set the curves in the Maps to select something meaningful in an image, and then use both the Contract/Expand slider and the Falloff Slider to view the results. It will probably be easiest to use Overlay Color for your initial tests.
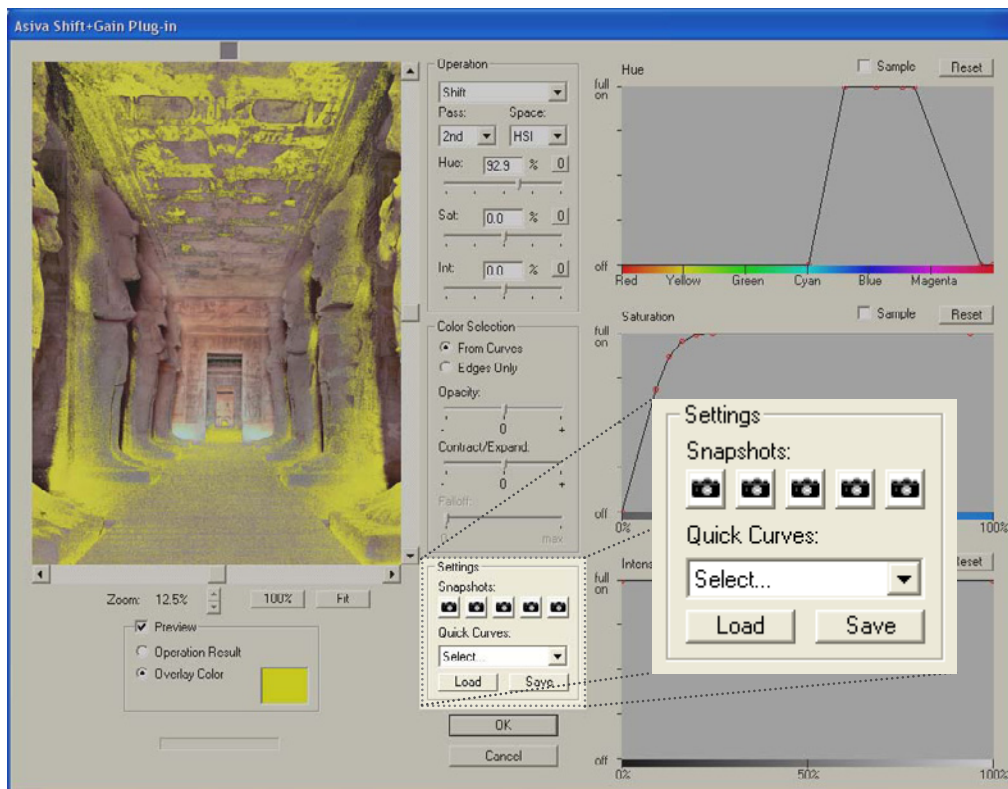
Figure 2.11 The Settings Group.

The Settings Group

The Settings Group contains tools for saving, loading and recalling Shift or Gain Operation parameters, and quick curve settings for the Asiva Shift+Gain Dialog. The group is composed of Shapshots, Quick Curves, and buttons to either load or save complete Gain or Shift parameter files.

Snapshots

Snapshots are an easy way for you to store Operation parameters, or settings without having to go through the operating system to save to, or load from an actual file. **Snapshots are active *ONLY* while the dialog is present and not during a Photoshop session, like most of the parameters are**. They are designed so you can quickly save and recall permutations or variations in the settings for an Operation.

Initially, the 5 Snapshots are empty, indicated by a white background. Clicking on one of the Snapshot buttons will store the current settings in memory and tie them to the particular button. The button will change to a green background, indicating it is storing a setting. You may replace the Operation's parameter settings stored in a Snapshot (green) by clicking on the Snapshot. Since it already contains settings, a dialog will be shown asking you for confirmation so you don't inadvertently write over a Snapshot.

To recall the Operation's settings for a particular Snapshot click on a Snapshot while holding down the <control> key. If you <control> click on a Snapshot that is empty nothing will happen, thank goodness.

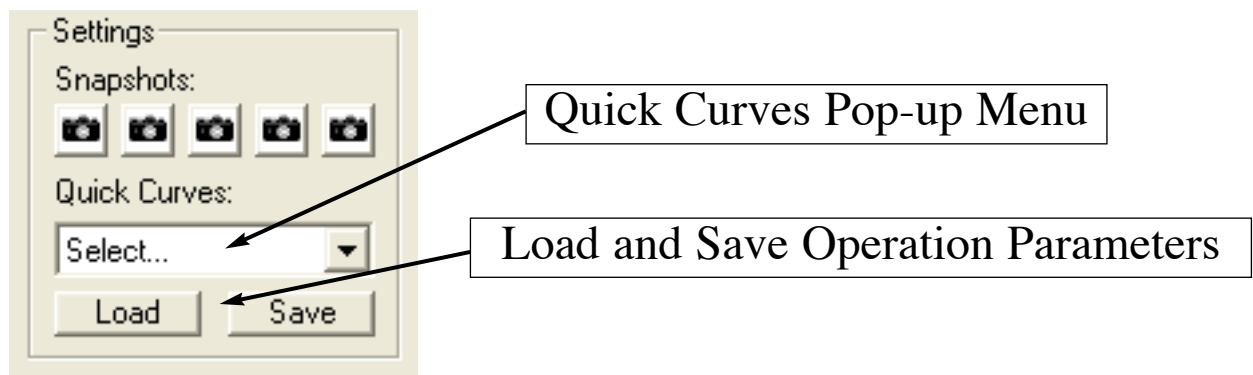To empty a Snapshot, hold the <shift> key key down while clicking on the Snapshot you want to empty.

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Quick Curves Pop-up Menu

Load and Save Operation Parameters

Figure 2.12 Quick Curves Pop-up and Load/Save Buttons.

Quick Curves Pop-up Menu

How you set the curves in the three Maps is key to getting the results you are looking for. To possibly help give you a quick start with proper curve settings, we have included a list of curve settings you can access via this pop-up menu. For example, primary hue colors, sky variations, water, variations, different ethnic skin tone variations, etc. A Quick Curve setting may not work for your particular image but may give you a starting point from which to understand the curves and then successful master them.

Note: The Quick Curve settings are for setting basic curve shapes in the Hue, Saturation, and Intensity Maps ONLY. They are NOT complete Operation parameter sets.

The Load Button and Save Button

The Load Button and the Save Button are exclusively for loading and saving Asiva Shift+Gain dialog parameters, or presets. Clicking on the Save Button will display the standard Windows *Save File Dialog*, which will allow you to navigate, create new folders, name the file you want to save to, and ultimately save the current Operation's settings to disk. Your PC Shift+Gain presets are compatible with the Mac version. However, any Shift+Gain presets should be saved in files with the extension .app5 for Shift or .app6 for Gain.

Clicking on the Load Button will display the standard Windows *Open File Dialog*. This dialog will allow you to navigate around to locate a previously saved Shift+Gain Operation preset file. You may open either a Shift or Gain preset files.
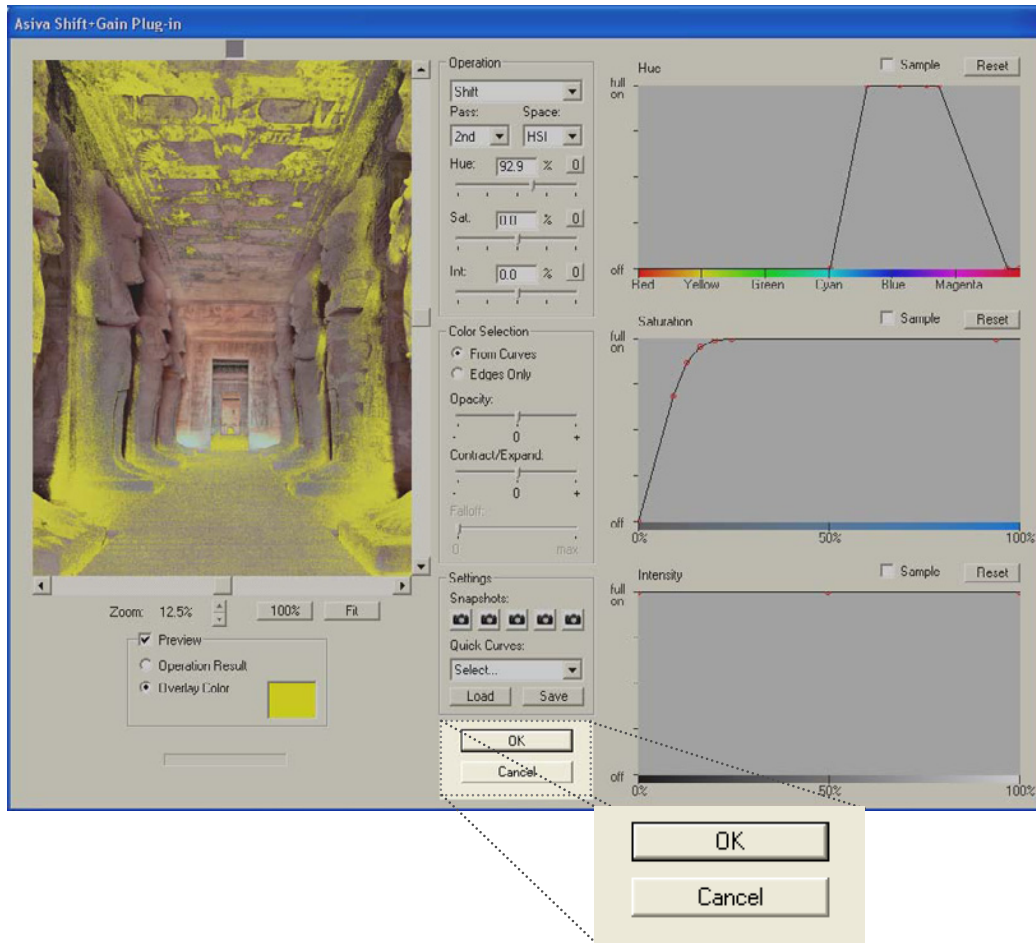
Figure 2.13 OK and Cancel Buttons.

The OK Button and the Cancel Button

Figure 2.13 shows the location of the OK Button and the Cancel Button within the Asiva®
Shift+Gain Plug-in.

Note: The OK button will be enabled only if the plug-in has been serialized.
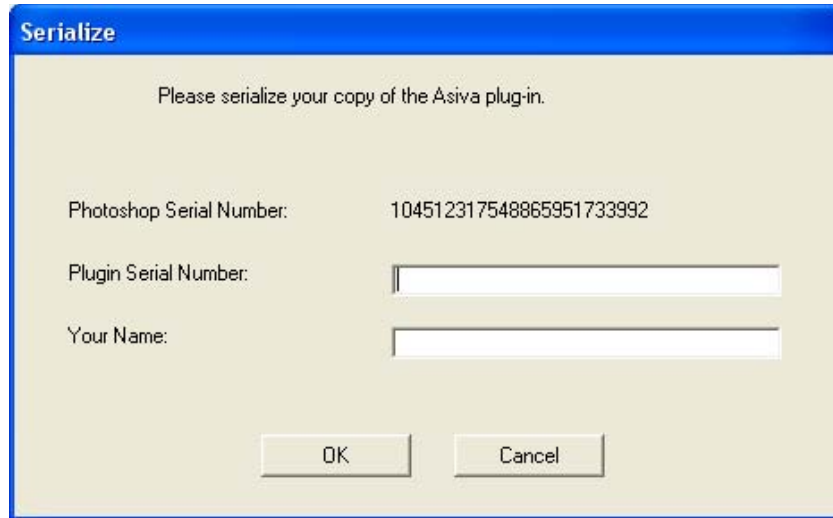
Selecting "OK" will close the dialog and process the image in Photoshop, using the current
settings of the plug-in's controls. If the processing of the image is lengthy, a progress dialog
will be displayed. The current state of the settings within the plug-in will be saved, such that
typing <command><F> (apply filter again) in Photoshop will render the image again with the
same Asiva® Shift+Gain Plug-in parameters. In addition, the next time the plug-in is opened in
the same Photoshop session, the previous settings will appear, with the exception of the
Snapshots.

Selecting the "Cancel" button at any time will dismiss the Asiva® Shift+Gain Plug-in dialog
without altering the current image. However, any changes to any controls, such as maps,
checkboxes, etc., will be saved, and appear the next time the plug-in is opened, in the current
Photoshop session, with the exception of the Snapshots.

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The Serialize Button

On the lower left corner of the Asiva® Shift+Gain Plug-in dialog is the Serialize Button which will be removed whenever the plug-in has been serialized. You cannot process a full-sized Photoshop® image until you have serialized the plug-in.

Clicking on the Serialize Button will display the following dialog:

Figure 2.14 Asiva® Shift+Gain Serialize dialog.

Enter the serial number that has been sent to you in the "Plug-in Serial Number:" text field. You may include hyphens (-) between groups of 4 numbers/letters. Enter your name in the appropriate text field and click the OK Button. If there is a problem with the serial number, a message will be displayed.

When the plug-in is properly serialized, the Serialize Button will no longer be displayed, and the OK Button will be enabled.

Asiva® Shift+Gain Maps

Chapter I, <u>Installation and Introduction</u> stated the real power of this plug-in comes with the three Maps, found on the right side of the dialog. The three maps are the Hue, Saturation, and Intensity Maps, from top to bottom. ***It cannot be overstated that an understanding of color models is essential to fully utilize the power of the plug-in, particularly HSV/HSI.***

The three maps work together to specify precisely how much an operation should be applied to individual pixels in an image, based upon their color characteristics. No one map has precedence, or higher weight, than another. The curve in each map defines the range or ranges of hue, saturation, and intensity respectively. Since every pixel has a hue, saturation, and intensity, the relative Shift or Gain quantity can be determined by 'looking-up' each value in the corresponding map.

Why is this so powerful? Image anomalies, particularly those obtained via electronic capture, are almost always non-linear and relative to specific color and saturation. For example, the blue channel tends to be noisier than the others and low saturation pixels tend to be sharper than higher saturation pixels. This plug-in allows you to make corrections in a non-linear fashion to match the non-linear 'problems' in the image.
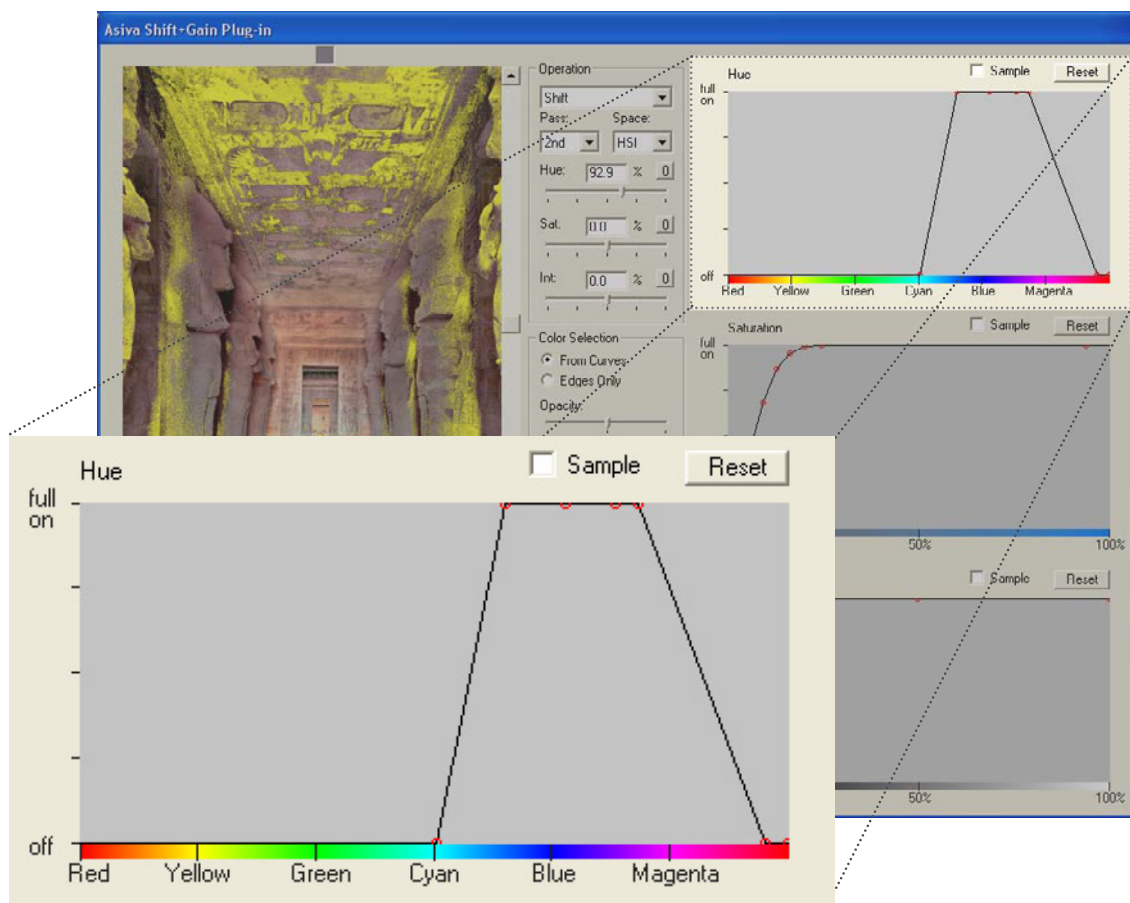

Figure 2.15 The Hue Map.

The Hue Map

The top map in the Asiva® Shift+Gain Plug-in dialog is the Hue Map (see Figure 2.15). For a

given pixel's hue value, this map determines the relative degree of shifting or gaining to be applied. By "relative" we mean relative to the pixel's Saturation Map and Intensity Map values.

You define a curve, which could be a straight line, by moving the cursor into the map and clicking and/or dragging. When the cursor moves into a Map area, it will change from the Arrow Cursor to the Crosshair Cursor. This is to let you know you are over a special area, and any mouse clicking will alter the shape of the curve.

The horizontal axis of this map represents hue values, from red to yellow to green to cyan to blue to magenta, and then back to red. Note the colored strip on the bottom of the Hue Map actually shows the range of hue values. The hue range of values is represented by degrees, from 0 degrees (red) to 359 degrees (red again), including fractional quantities. Hue is really a circle, and think of this map as a circle that has been flattened-out. The vertical axis on the left side of the Hue Map determines the amount of shifting or gaining for a given hue, with "off" meaning 'do not Shift or Gain at all', and "full on" meaning 'Shift or Gain the full amount'. Every value between "off" and "full on" on the vertical axis are relative Shift or Gain amounts.

The Hue Map tells the plug-in how to Shift or Gain over the entire hue range of values, all 65,536 of them. The curve drawn indicates to the plug-in to effect cyan-blue to magenta pixels.

You can move points on the Hue Map in one of two ways:

1. Place your cursor on an existing point on the curve, click and drag the point to any location within the map. As you drag the point, Asiva Shift+Gain Plug-in redraws the curve in straight line segments, from point to point.
2. Click once anywhere inside the Hue Map, not near an existing point. The Asiva® Shift+Gain Plug-in creates a new point where you clicked and redraws the curve.

In practice, you'll use both techniques when manipulating the curves in the Hue, Saturation, and Intensity Maps.
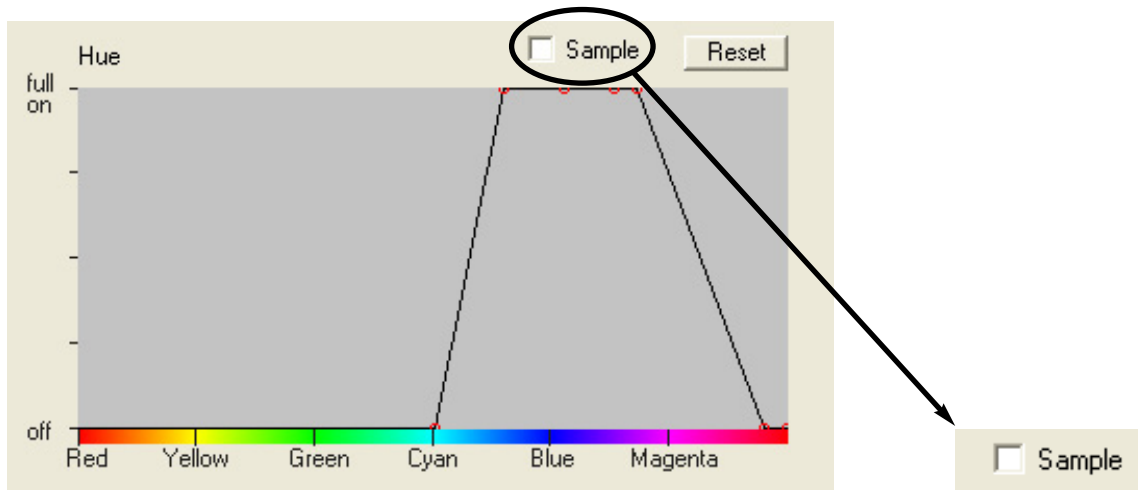
Figure 2.16 The Sample Checkbox for the Hue Map.

The Sample Checkbox

Figure 2.16 shows the Sample Checkbox, located on the top, right side of the Hue Map. If enabled, the Hue Map will be modified when you click or click and drag with the Color Sampler Cursor within the Image Pane. If this checkbox is disabled, color sampling will not effect the curve defined in the Hue Map.

The Reset Button

Adjacent to the Sample Checkbox is the Reset button. Clicking this button will reset the map's curve to its default state. For the Hue Map, the default curve is a straight line at "full on".
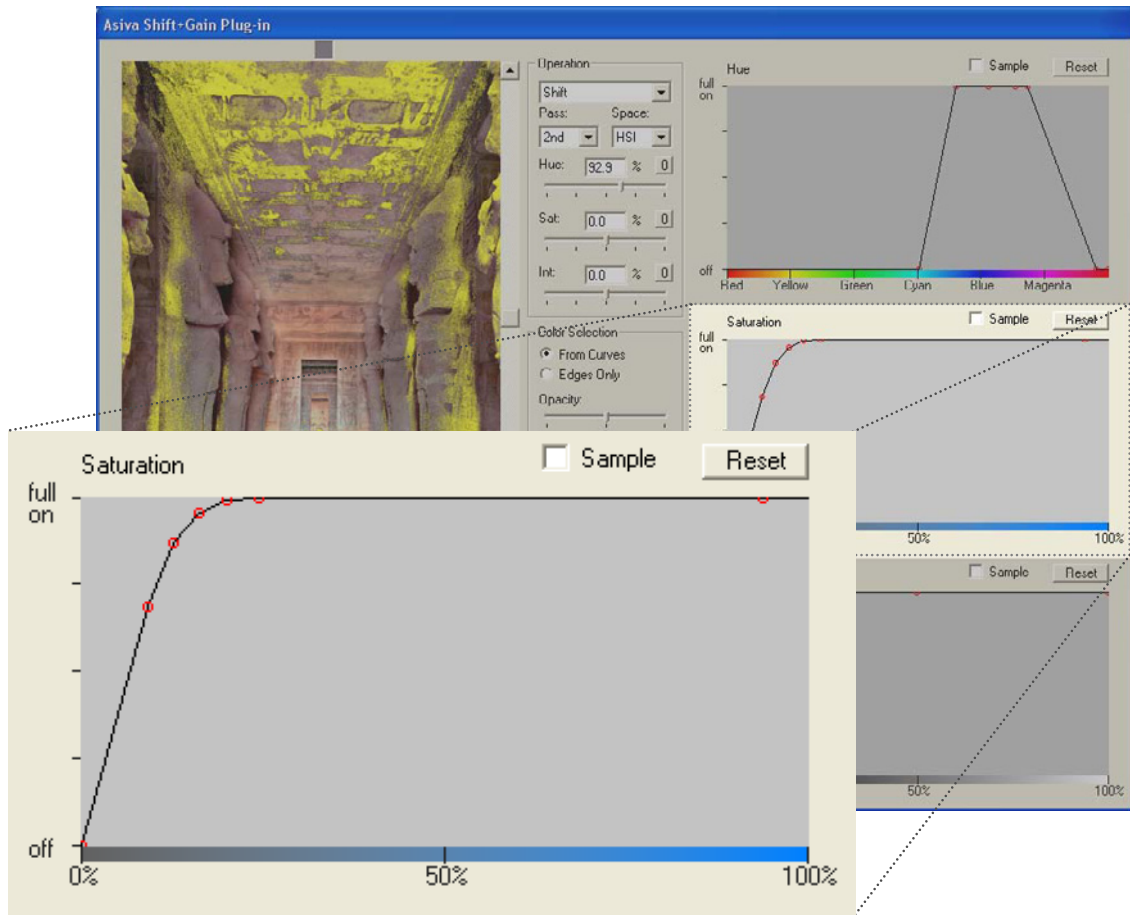
Figure 2.17 The Saturation Map.

The Saturation Map

Figure 2.17 shows a curve for the Saturation Map. You interact with this map in the exact same way as you would the Hue Map and Intensity Map, by setting the curve appropriately. However, the Saturation Map specifies how to Shift or Gain based on a pixel's saturation. Saturation is the purity of a given color.

The Saturation Map is directly related to the Hue and Intensity Maps. The saturation values that are 'selected' for shifting or gaining will be only those pixels which are 'selected' by the Hue Map and the Intensity Map.

The Intensity Map

The Intensity Map has has been discussed on pages 4-5 however it will be included here for completeness. The Intensity Map specifies how to Shift or Gain based on a pixel's intensity component. Intensity is the relative brightness of a given pixel.

The Intensity Map 'selects' the intensity component range for shifting or gaining, only for those pixels 'selected' by the Hue Map and the Saturation Map.
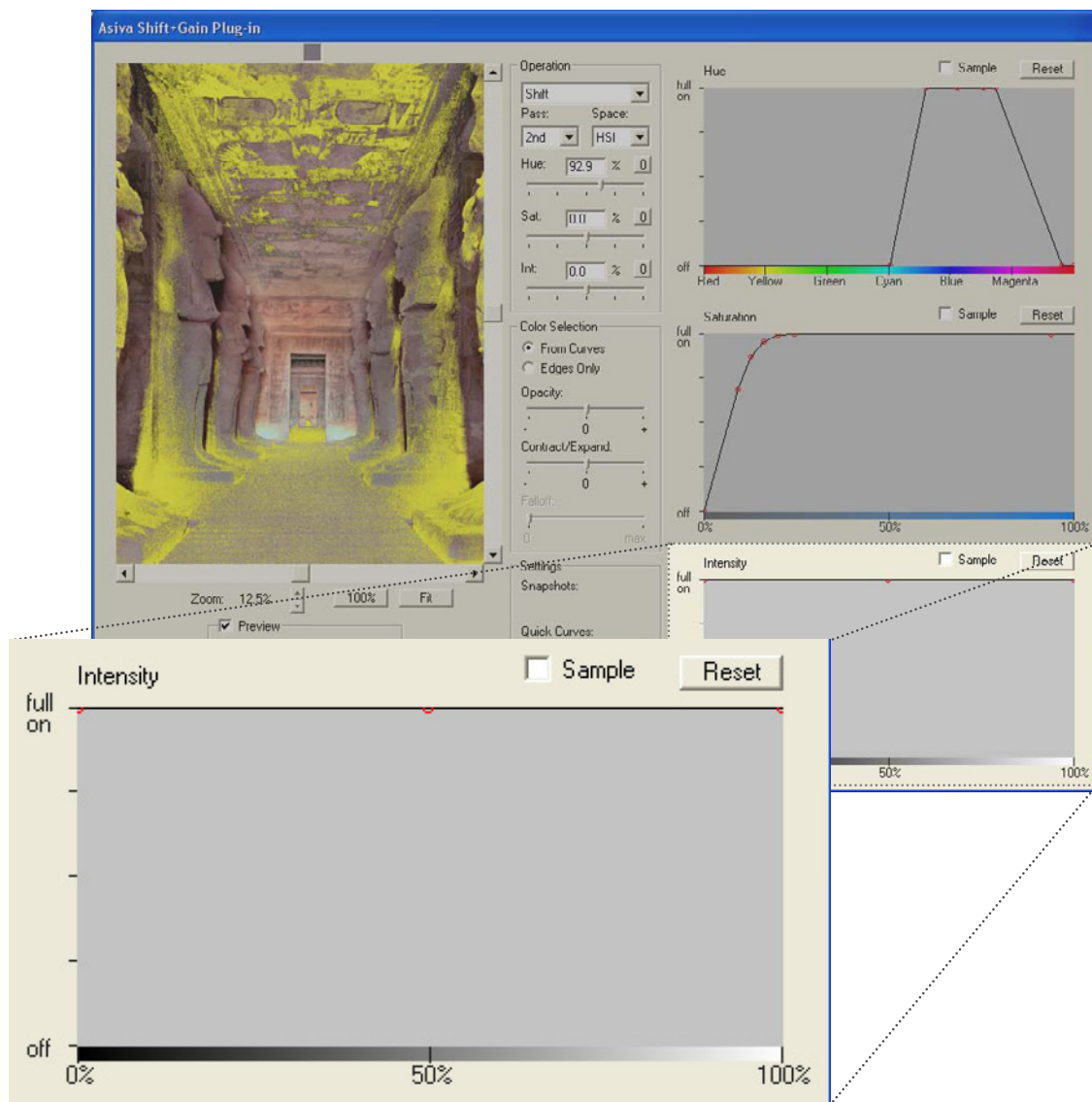

Figure 2.18 The Intensity Map.

Chapter III
SAMPLE IMAGES AND DIALOG SETTINGS

SAMPLE IMAGES AND DIALOG SETTINGS

This chapter shows some different sample images, before and after shifting or gaining color component(s) with the plug-in, as well as screen-shots of the plug-in dialog. They are not intended to render an artistic opinion, rather to give you ideas how to use the Asiva Shift+Gain plug-in for your particular needs.

Using the Shift Operation

The first example corrects the color cast found in the original, drum-scanned image of the *King Ramses Tomb*. The Shift Operation was utilized to achieve the desired results. Figure 3.1 shows the original and corrected version of the *King Ramses Tomb* image, via two Shift Operations.
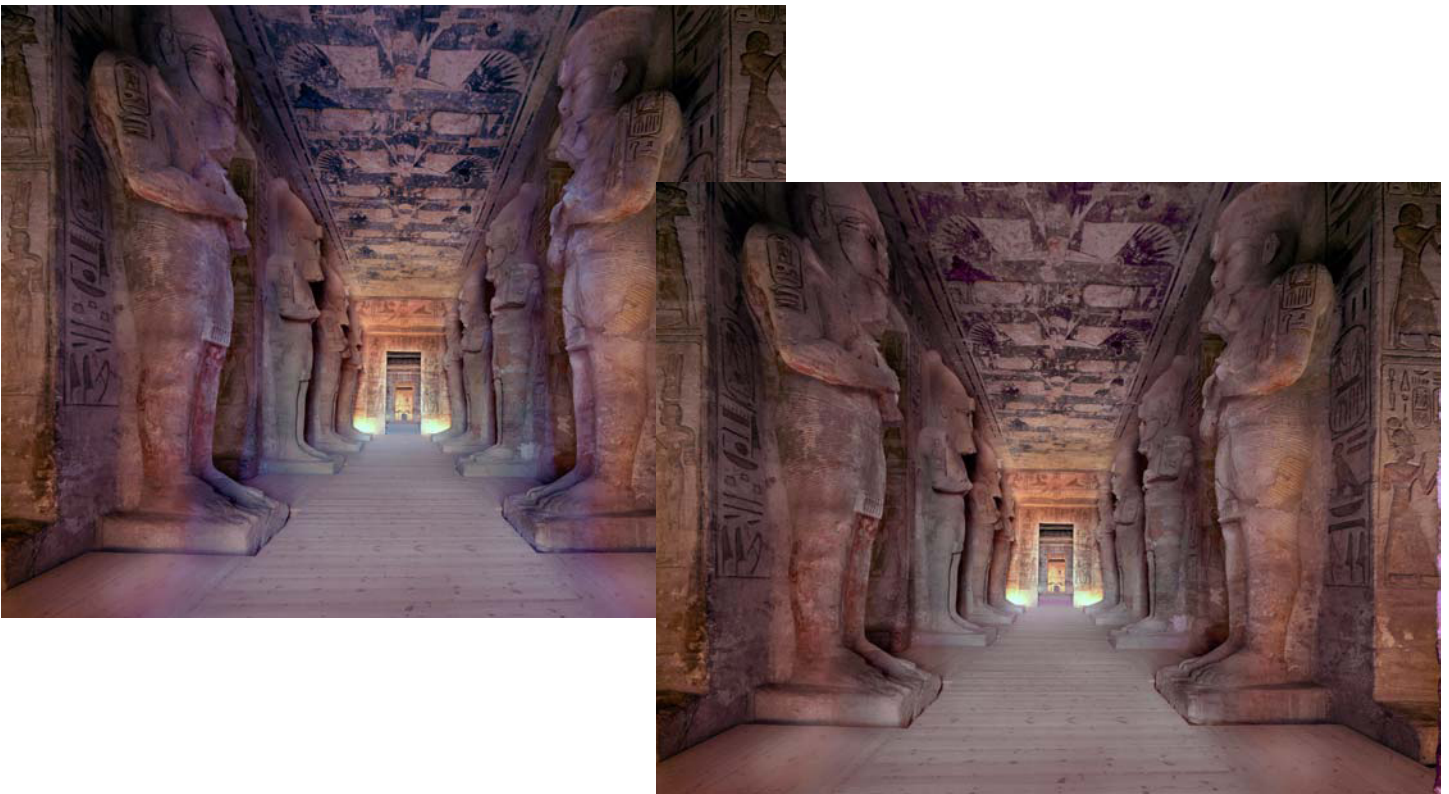

Figure 3.1 Original Ramses with magenta color cast(left) and Corrected Ramses (right).

The Procedure for Removing the Magenta Color Cast

Before we examine the specific settings of each control, how did we get to these setting? What is the step-by-step procedure?

Note that we have included a small version of this image for you to experiment with. You may use this image only for the purposes of learning how to use the plug-in. Also included are sample presets for Shift and Gain for each of the examples in this chapter.
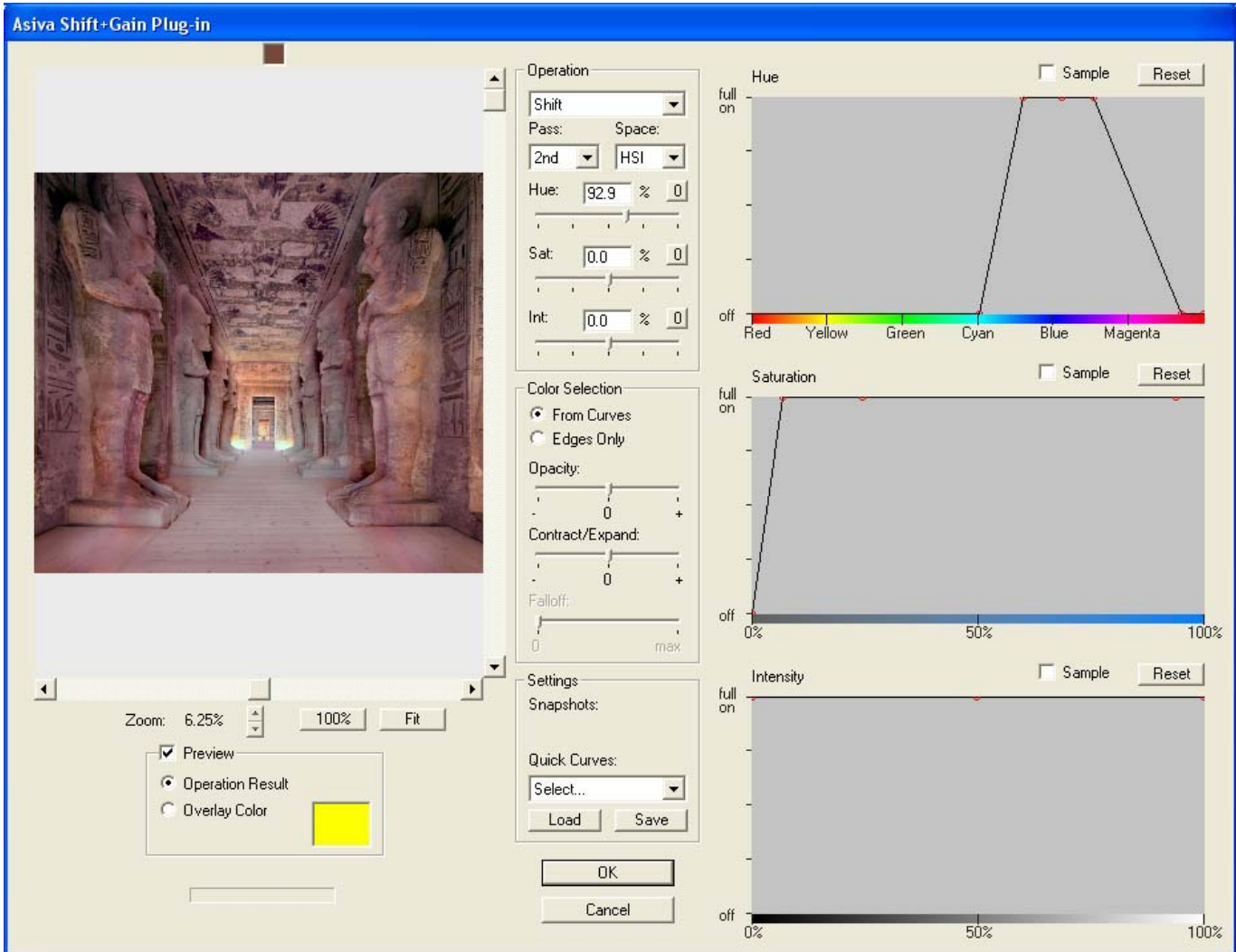
Figure 3.2 The First Shift Operation settings for removing magenta color cast from Ramses image.

1). Open the ramses.tif file with Photoshop.
3). Choose "Shift+Gain from "Asiva®" in the Filter menu.
4). If the Operation Pop-up Menu is not set to **Shift**, change it to Shift.
5). Make sure the Preview Checkbox is not selected.
6). Set the three curves in the Maps as shown above.
7). Choose "HSI" in the Color Space Pop-up Menu, located in the Operation Group.
8). Move the Hue slider to the right until somewhere around 76º is displayed in the text box.
9). Change the Overlay Color to yellow by clicking on the colored rectangle next to "Overlay Color" in the Preview Group.
10). Click on the "Overlay Color" radio button in the Preview Group to select it.
11). Review where the Shift Operation will 'hit' by selecting the Preview Checkbox. The Overlay Color will be placed on top of the pixels that will be affected by the Shift, in a gradient fashion depending upon your curve settings in the maps.
12). You can click on and off of the Preview Checkbox to see the original image and then alternately where Shift will be applied.
13). Change from "Overlay Color" to "Operation Results" to view the actual results of the Shift.
14), You may want to zoom-in, by using the 100% button.

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15). You can click on and off of the Preview Checkbox to see the original image and then alternately the results.

16). Save the setting for your Shift Operation, by clicking on the Save Button. This will provide a baseline setting you can always revert to, by loading it. Alternately, save these setting temporarily by clicking on one of the small camera icons located in the Settings Group. Please note that the Snapshot Settings are only active while the dialog is open.

17). Click on the Okay Button to apply the Shift to the full-sized image.

Let us review the meaning of the Shift settings. If you look at the Hue curve in particular, you will see that we have selected from cyan to magenta-red hues, with the curve peaking between blue and magenta. This IS the color we are attempting to remove. The shape of the hue curve is very important because the slope of its left and right sides determines how the Shift will falloff to 0. You could demonstrate this fact by altering the hue curve with Preview on and viewing the results. Also notice the only component shifted was Hue. No other color component sliders were adjusted. The Shift Hue amount, of about 93 degrees transformed the hue of the blue-magenta color cast toward the reddish tones.

Notice we missed some red-magenta cast. Figure 3.3 shows the results of the Shift Operation described above.
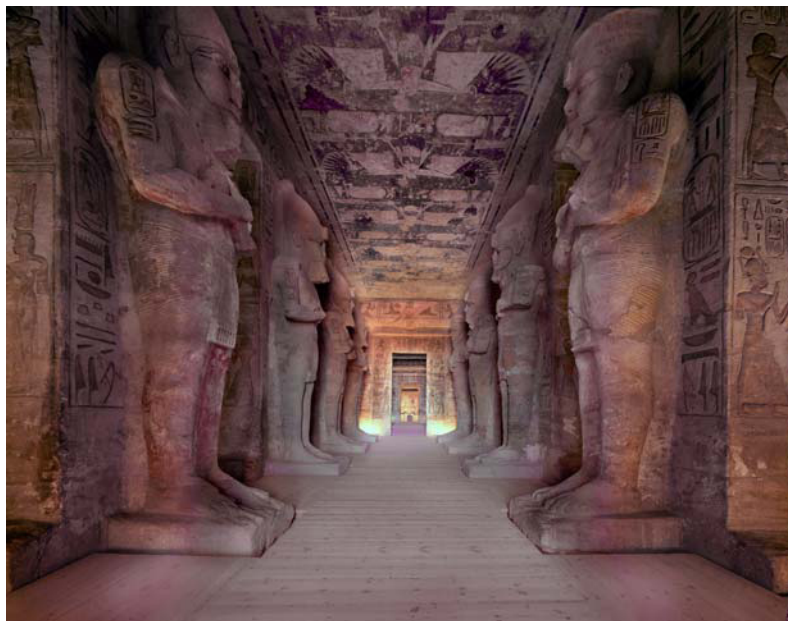

Figure 3.3 Results of First Shift Operation on Original Ramses image.

To remove the remaining color cast, we are going to have to target it in another Shift Operation. But this time we will not have to shift the hue over nearly as much since it is much closer to red than the blue-magenta cast.
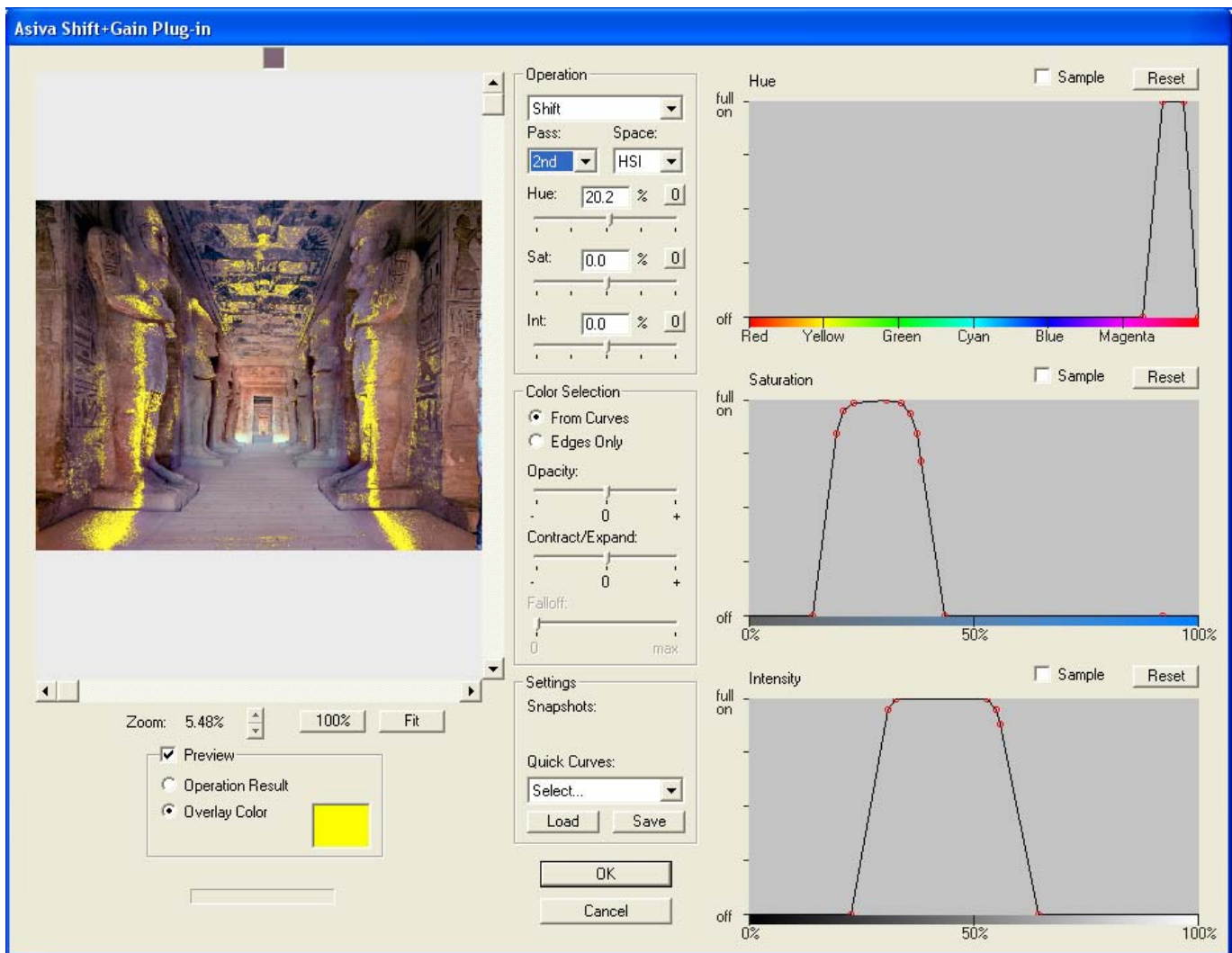
Figure 3.4 Second Shift Operation settings for removing remaining color cast.

A Preset is included for the Shift settings shown in Figure 3.4, however you might want to practice sampling source color(s) with the Color Sampler and setting other parameters such as the curves on your own. Notice we have set Preview to Overlay Color so we can definitively see where the 20º hue shift will occur, and the strength of the shift.

Figure 3.1 shows the final results after applying this second Shift Operation.

Lets do a different type of Shift Operation to achieve a completely different result: we will use the Shift Operation on the saturation component. One of the classic deficiencies of electronic image capture is the rapid transition from good, saturated color to washed-out color. This contributes to, what I call the 'tinny-look' of digitally captured images. An easy way to correct these types of images is to fill-in some saturation using shift. That is, make the saturation transition smoother.

Consider the following image shown in Figure 3.5, taken by a digital camera:

Figure 3.5 Digital Camera image with typical poor saturation range.

To fill-in some color saturation where it is lacking, we could use the Asiva Shift Operation to shift upwards the lower saturation values. Shift would be more appropriate than gain here because we are trying to impact lower values. Figure 3.6 shows how we would set the curves and the Saturation slider in the HSI Color Space to get the results we desire.
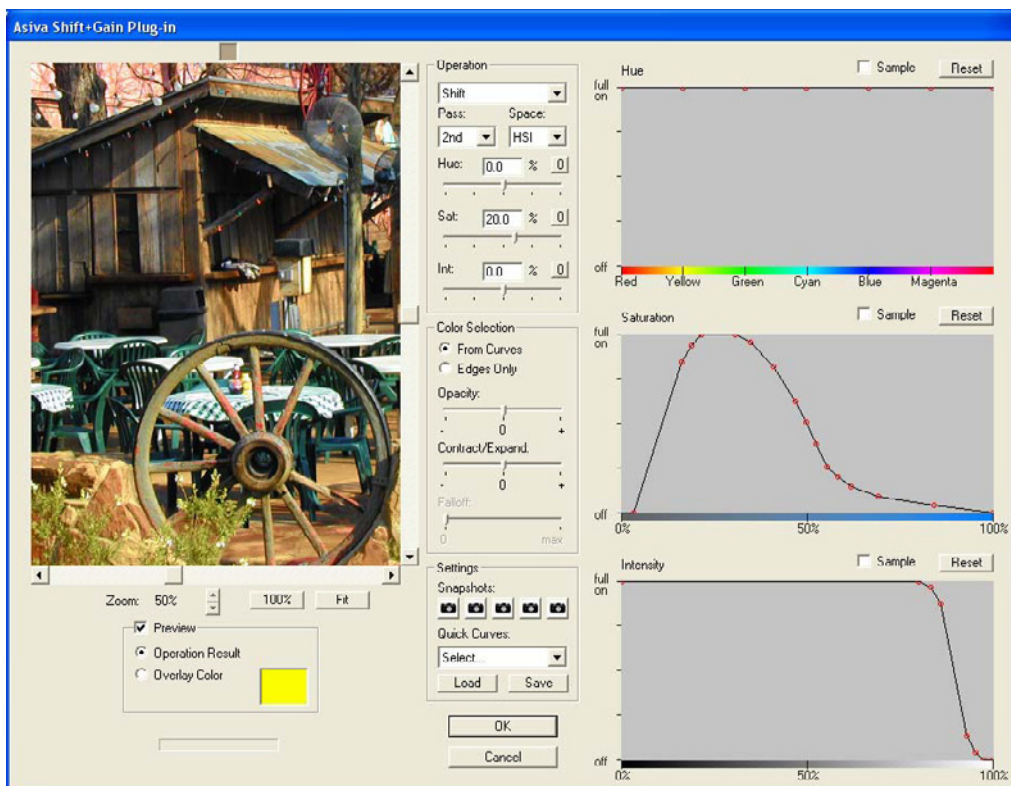

Figure 3.6 Shift Operation settings to boost low saturation only.

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Notice the Saturation curve in particular. What the curve shows in general is lower level saturation values should be selected, or impacted, more than higher level saturation values. In particular, fully saturated pixels should not be touched at all, nor should 0% saturated pixels - that is our grayscale, and we certainly do not wish to throw off the white balance.

The Intensity curve has been drawn to omit whites as well.

The Hue Map is flat-lined at "full on". This means the saturation will be filled-in for all hue's. If we wanted to impact reds more than blues, or omit greens altogether, we could set this curve appropriately.

The Saturation slider has been set to about a 20% increase. All other sliders are at zero so they will not impact the image.

I encourage you to experiment with this basic use of the Shift Operation on the saturation component. Tweak the Saturation curve, and try different Hue curve settings, as well as Saturation slider amounts.

Using the Gain Operation

A gain is multiplying, or one could say "dividing" when the gain factor is less than 1.0. Gain uses fractional numbers like 1.33. The larger a component's numeric value, the more a gain will impact it. This is just pure math. For example, in the HSI color model, we know that the "I" stand for Intensity. Intensity is essentially the particular brightness value of a given pixel. The lower the intensity number, the darker a pixel is. The relative amount of change to intensity using a gain, increases with the actual intensity.

Our next example will use the Gain Operation to gain down some of the higher level brightness values in a digital image. Similar to the rapid color saturation transition, electronic images are notorious for a rapid transition of light levels. This also contributes to the poor aesthetic of digitally-acquired images, in general.

Looking at the image in Figure 3.7, lets just say we choose to smooth-out the brightness transition and also treat different colors unequally. I mean, lower the brightness in the reds and yellows more than in the cyans and blues.

Figure 3.7 Digital Camera image with typical poor luminance range and transitions.

To accomplish the changes I described, we could use the Asiva Gain Operation to gain down the brighter values. Gain would be more appropriate than shift here because we are trying to impact higher brightness values more than low brightness values. In fact, we do not want to touch the shadows at all because that would actually contribute more toward a 'contrasty' image - not what we are trying to achieve here.

The screen capture in Figure 3.8 shows how we would set the Gain Operation's curves and the Intensity slider to get the results I described.
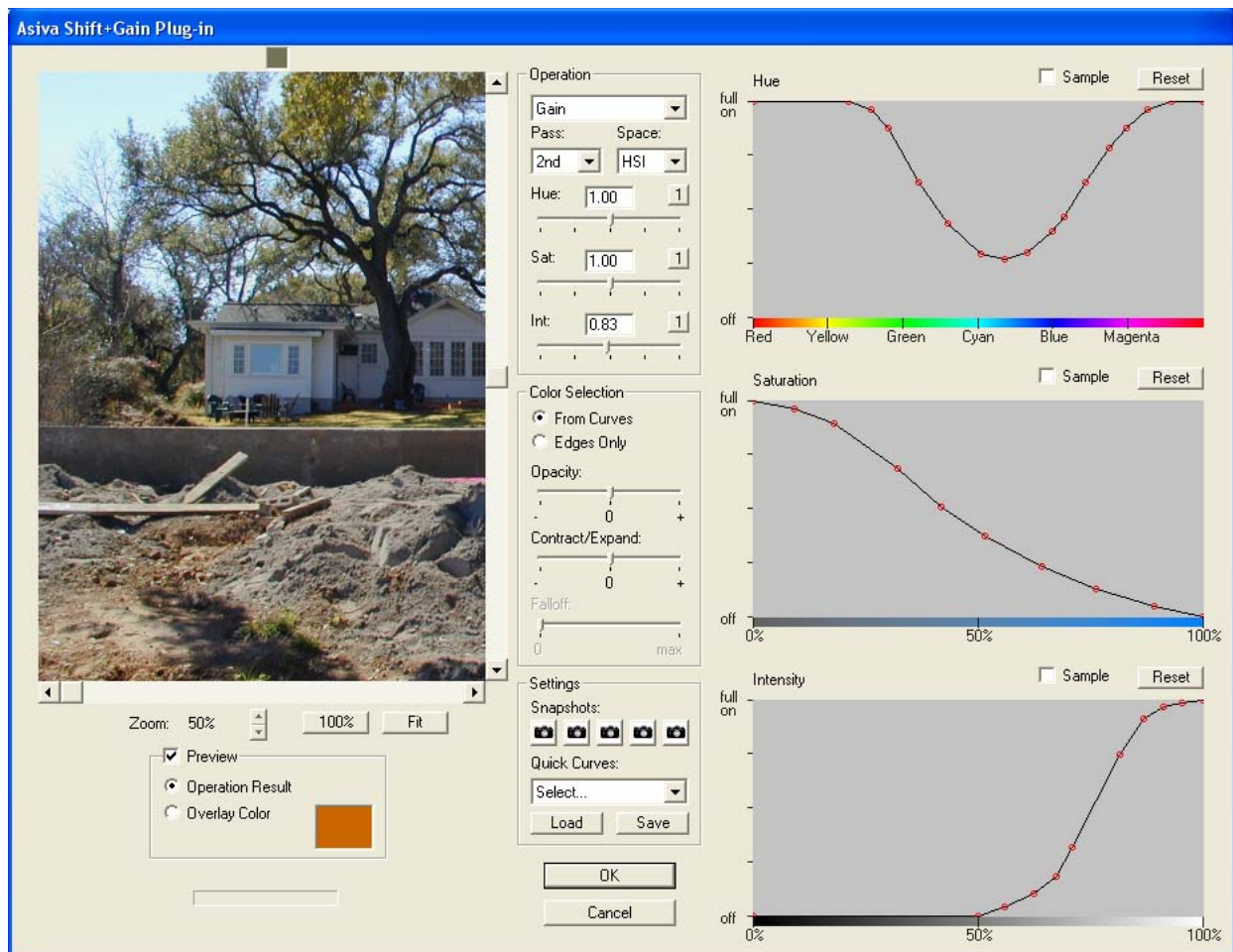
Figure 3.8 Digital Camera image with typical poor luminance range and transitions.

The Intensity slider has been set to 0.83. This is the base number the applicable Intensity components will be multiplied by. I say "applicable" because the three curves will select the pixels in the image to be affected, and determine a relative Gain based upon each pixel's Intensity component.

Notice all other component sliders are set to 1.0 so they will not be adjusted. This is due to the fact any number multiplied by 1.0 is equal to itself.

Pay special attention to the last curve, Intensity. What this curve shows is for the Gain Operation to affect high level brightness values. The middle curve, saturation, is highest at 0% saturation. We know by definition that the brighter pixels we desire to change will tend to have lower saturations. Also notice the Hue Map is set to mostly change red to yellow pixels and to a lesser degree, cyan to blue pixels.

The results of gaining the brightness down, using Asiva's Gain Operation settings shown above, would tend to smooth the transition from dark to bright areas. The best aesthetic is something you will have to judge for yourself, so experiment!

Shift+Gain
Version 2.2

Plug-in for Adobe® Photoshop®

Windows® 2000/XP