

# Raw Photo Processor (RPP) Manual

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Current version is 4.8.0.

Download link to 64-bit binary for Mac OS X 10.6-10.10 : [RPP 64.zip](#)

Download link to universal legacy binary for Mac OS X 10.4-10.10 : [RPP Uni.zip](#)

Please, provide your feedback! I want to know your opinion of RPP. You may do this with the "Provide RPP Feedback" item found in the "Raw Photo Processor" menu in RPP or you may click the link [rpp@tigry.net](mailto:rpp@tigry.net) to do the same right now!

Thank you!

**You can use keyboard Up/Down arrow keys to change numeric field values and scrolling up/down with mouse or trackpad when hovering over them.**

Keyboard shortcuts notations, all according to Apple standards

⌘ is Command key

⌥ is Option (alt) key

⇧ is Shift key

⌘ is Control key

## New features and bug fixes in 4.8.0:

- Dropped support for PowerPC Macs
- Added Mac OS 10.10 (Yosemite) support
- Added support for Panasonic G5, G6, GH4; Leica M240, X2 and VARIO; Fuji X-T1, XQ1; Nikon D4S, D810; Sony A77 II
- New profiles for Nikon D4, Df;
- Kodak WB presets are listed now
- Bugfixes

## New features and bug fixes in 4.7.2:

- Mac OS X 10.9 Mavericks support
- Added support for Canon 70D, SX50 HS; Sony A7, A7r, RX1R, RX100 II; Panasonic GX7, GM1; Olympus E-M1, E-P5, E-PL5, E-PM2; Fuji X-M1, X-E2, X-A1; Nikon D610, Df, D5300; Pentax K-3 (DNG only);
- Interpolated image size is going to be bigger by 6 pixels in each dimension
- Bugfixes



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## Distribution

RPP is a Macintosh application that works on all Intel Macs using OSX 10.4-10.10. PowerPC Macs are not supported anymore. A permanent download link is given at the top of this document.

## Unlock Code

An unlock code is available to all donators (past and future). Entering the code enables additional features, such as Multi CPU Processing, Workflow Helpers, Camera Profiling, and Integration, which are described below. I try to send the unlock code immediately upon receiving a donation email.

[Note: If you donated before October 6, 2008, please send me an email so I can send it to you as soon as I can. If possible, please use the email address that you used for the donation. Otherwise please provide your full name, city, and country.]

The code is personalized and includes your name. It is intended to be used only by you and not to be shared with others. Should you need to use more than one copy, please let me know.

## List of Supported Cameras

RPP should work with all "traditional" RGBG-Bayer based cameras (such as Nikon and Canon DSLRs, most digital cameras, large and small, with raw support and many others). RPP does not work with Foveon based cameras and currently does not support non-RGBG-Bayer cameras.

If you do not find your camera or MF back in the list below, simply ask. Expanding DSLR support is a primary goal that receives much of our attention. We can profile most cameras and your requests help us to set priorities. Similarly, let us know if you think the existing profile provided for your camera could be better.

List of cameras with built-in custom profiles:

Leaf MF backs

Mamiya ZD MF

Hasselblad H3D MF, V96C MF, H4D

Phase One P20, P20+, P21, P21+, P25, P25+, P30, P30+, P45, P45+ with alternative profiles for incandescent light (via menu Profiles).

Canon DSLRs D30, D60, 300D, 350D, 400D, 450D, 500D, 550D, 600D, 650D, 1000D, 1100D, 10D, 20D, 30D, 40D, 50D, 60D, 7D, 5D, 5D Mk II, 1D, 1D MkII, 1D Mk IIIn, 1Ds, 1Ds MkII, 1D MkIII, 1D MkIV, 1Ds MkIII, 5DMkIII, 1D X, 6D, 1D C, S100, 70D

Nikon D1 and all other Nikon DSLRs (up to D4S, D810)

Fuji S2-Pro, S3-Pro, S5-Pro, X100, X-Pro1, X-E1, X-S1, X100S, X20, X-M1, X-E2, X-A1, X-T1, XQ1 and also all smaller models.

For Fuji S3 and S5 cameras RPP automatically blends R and S pixels when applicable.

Olympus E1, E10, E20, E300, E330, E400, E410, E420, E500, E510, E520, E620, E3, E30, EP1, EP2, EP3, EPL1, EPL2, E5, XZ-1, E-PL3, E-PM1, E-M5, XZ-2, XZ-10, E-M1, E-P5, E-PL5, E-PM2.

Kodak 14N, 14NX, SLR/n, SLR/c, 760C

Kodak ProBack MF (all)

Minolta DSLRs 5D and 7D

Pentax DSLRs \*istD, \*istDL, \*istDL2, \*istDS, \*istDS2, K10D, K100D, K110D, K20D, K200D, K2000, K-x, K-7, K-r, K-5, Q, K-5 II, K-3

Samsung DSLR (same as Pentax), NX10, EX1/TL500, NX11, NX100, NX200, NX1000, NX300

Leica DMR, M8, M9, Digilux 3, S2, X1, M Monochrom, M240, X2 and VARIO

Sony R1, A100, A200, A230, A290, A300, A330, A350, A380, A390, A450, A500, A550, A700, A850, A900, NEX-3, NEX-5, A55V, A33, A560, A580, A35, A37, A65, NEX-C3, A77V, NEX-5N, NEX-7, NEX-F3, RX100, RX1, A7, A7r, RX1R, RX100 II, Sony A77 II and all other SLT and NEX cameras.

Panasonic DMC-G1, DMC-GH1, DMC-GF1, DMC-G2, DMC-GH2, DMC-G3, DMC-GF2, DMC-GF3, DMC-G3, DMC-GX1, DMC-LX7, DMC-FZ200, DMC-LF1, DMC-GX7, DMC-GM1, DMC-G5, DMC-G6, DMC-GH4

Epson R-D1

All Ricoh cameras

All Canon P&S cameras including G1X (+CHDK)

All Nikon P&S cameras including P7100

All Sony P&S cameras

All Olympus P&S cameras

All Fuji P&S cameras

All Panasonic P&S cameras including LX5

All Samsung P&S cameras including TL350/WB2000

All Leica P&S cameras

## What is RPP?

RPP is a Raw converter that supports almost all available digital Raw formats. It is made for photographers by a photographer-programmer, immeasurably aided by the help and tutoring of my friend, professional photographer Iliah Borg. We had our fill with those converters made by programmers for their upper management. :)

You can think of RPP as the development machine in processing your images. In terms of film photography, you must first develop your roll properly, then you can do whatever you want with it. It is the job of RPP to accomplish only the first task: a proper development. RPP is *not* a full-featured photo-processing package. You will need Photoshop or some other application to apply sharpening, cropping, tonal and color corrections, transformations, layers, and the like.

But there are a number of important, basic developmental operations that can be and, indeed, are best performed in RPP. Unlike many raw processors, which demosaic the data once and then work over the same interpolated image as you adjust settings, RPP does most of its operations directly on the raw data and applies them with each requested change.

Let me list the operations available in RPP and give some preliminary explanations:

4-channel white balance - this is probably the most important operation in Raw processing and it has to be applied at very early stages of processing.

Exposure Compensation - this is another very sensitive step that requires high precision math to preserve shadows and highlights. It is almost impossible to accomplish EC properly during post-processing in Photoshop.

Compressed Exposure - this is similar to Exposure Compensation, but it allows adjusting exposure without clipping or creating "overexposed" areas. Rather, it compresses higher values within a specified range.

Saturation - this is a very tricky operation that has to account for specifics in human color perception. Saturation is commonly implemented with very crude methods, but I am trying to keep up with color science and use a significantly more sophisticated approach.

Brightness and Contrast - these represent attempts by Iliah Borg and me to create tone-curve adjustments based on actual film-density measures in different development modes. You should finally be able to obtain that highly desirable film-like tonality in your images.

Interpolation - RPP supports five interpolation methods at the moment: VCDMF, AHDMF, VNG, 2/3 and Half. [Half is not actually a method of interpolation but rather a half-resolution recombination of four

single-colored pixels (RGBG) into one RGB pixel. It is very fast and color-accurate, but results in lost resolution.] VNG and 2/3 methods are only methods available for Fuji X-Pro1 and not available for other cameras.

Highlights Recovery - this is a simple tool for restoring clipped channels if present (for example, the "pink sky" problem).

Local Contrast - this tool is based on the High-Radius, Low-Amount (HiRaLoAm) USM technique popularized by Dan Margulis to give images more "pop" without adversely affecting overall tonality, as can occur with too much regular contrast.

Simulations mode - this gives a scientific means for producing b/w, sepia, and other kinds of color and monochrome images based on measurements of actual photo papers and films made by Iliah Borg.

A histogram with individually selectable R, G, B, and L\* graphs and having EV, L\*, and Adams' Zone System scales. It is also possible to display the raw histogram.

Complete EXIF data given by ExifTool.

Built-in default profiles are provided for all the cameras listed above. In addition, for those who prefer to "roll their own," RPP provides facility for generating custom .icc camera-specific profiles. Profiles are generated through integration with ArgyllCMS based on samples provided by RPP.

## Do I Need RPP?

Are you a serious RAW shooter? Then you are going to want to try RPP. But, if you do, don't give up too soon. RPP is likely to behave differently from other RAW converters you may have used. That's the reason it is able to produce the kind of results it does. So it may take you a while to get used to it, but, when you do, you will find it effective and efficient, and you should enjoy large improvements in important areas of your images.

So, if you're not happy with the quality of the images coming from your current Raw converter, if you want to capture everything that's available in your Raw files, if you want to be able to process some heavily underexposed images and see details in the shadows instead of a black digital void, or if you are just missing that old slide-film look in your digital images, then you will definitely want to give RPP a try.

## RPP Usage

RPP is a Universal application that runs on both PowerPC and Intel Macs, but its performance clearly benefits from the greater horsepower of multi-core Intel processors.

RPP supports almost all existing Raw and DNG formats, but some cameras are supported better than others. The list above tells which cameras are fully supported, but we are adding new profiles almost every week. For fully supported cameras, there are built-in (Default) profiles, and you can expect colors to be accurate. For the others - well, the colors should be good, but not as accurate as they might be.

RPP also supports custom camera profiles. You need only copy your custom profiles to the directory ~/Library/Application Support/RPP/Profiles. All profiles with extension .icc or .icm in this directory will appear in the **Profiles** menu in the menu bar, where you can select among them or the built-in profile for the given camera, denoted Default. The **Profiles** menu is populated automatically at launch time (beginning with version 3.5.7).

Additionally, RPP includes a camera-profiling facility that allows you to generate and incorporate the custom .icc profiles for your various cameras. This facility and its use are described below in the *Camera Profiling* section. Means for generating the necessary targets are described in the *Lighting and Capturing the Target* section, written by Iliah Borg.

Some cameras benefit from different profiles for different conditions. The Leica M8, for example, needs a different profile when the Hot Mirror filter is attached. RPP provides alternative built-in profiles in many such cases. When you load an image from a camera for which RPP has alternative profiles, the **Profiles** menu will be created (if necessary) to allow your choice.

## Basics

Your communication with RPP is via the various menu items and controls on the control panel. We begin here with an overview of the basic control-panel operations (buttons, input fields, and some associated menu items). More detailed descriptions of several functions and operations, including the actions of the various controls, are given in dedicated sections to follow.

Tooltips exist for almost all elements of the control panel. Hover your mouse over the element to see information about values and shortcuts.

To open a Raw file you can use the **Open** button (⌘O) or you can drag-n-drop a file on RPP's icon, or you can use the **Open with** menu in the Finder. RPP is also readily integrated to work with external picture organizers like Adobe Bridge and others. You may even set it as the default application to open your Raw files [Use **Get Info** (⌘I) on a Raw file icon in the Finder and stipulate RPP in the **Open with** section].

Numeric input fields, when selected (click in them), may have their values altered with the Up and Down arrow keys. ^Up/^Down multiplies the steps by 10. There are shortcuts [see tooltips for specific controls or menus] to jump directly to most of input fields. The shortcuts are displayed in blue to the right of the input fields [assuming held ⌘ key]. There are also shortcuts to toggle the tickmarks for Local Contrast and Sharpness: ⌘↑-field number (check their tooltips).

**Zoom to Fit** scales the image to fit in the Preview window. When it is disabled, however, you may scroll the image either by using the scroll ball on the mouse, or with two-finger touchpad scrolling on supported laptops, or by pressing  $\hat{u}$  and dragging the image with the mouse. Double-click in the Preview window also acts as switch for this mode. Point of click will be centered in the window.

Preview is always in the Half-mode (half resolution from actual). This allows for greater speed, since there is no interpolation involved, but retains more than enough quality for accurate color adjustment. [This is for Preview only and has no effect on the actual interpolation of the Raw image.]

To apply changes you must press the **Apply** button or, better, use the shortcut  $\mathfrak{R}$ .

[Note: I know, I know - please hold your grief. If you have grown accustomed to instant feedback in other RAW processors, you may, at first, find this a shortcoming. In fact, it is a strength. Each rendering of new settings (**Apply** or  $\mathfrak{R}$ ) by RPP produces a fresh interpolation of the Raw data rather than a refurbishing on top of the original demosaiced data. This is an important reason for the quality of the images produced by RPP, and it takes time-consuming computer horsepower to accomplish. So be patient and enjoy the result. :-)]

At any time you may reset settings to the application-default state by pressing **Apply** while holding the  $\mathfrak{R}$  key ( $\mathfrak{R}\mathfrak{R}$ ). This application default is not the same as a Directory Default or a Camera Default, both of which will be discussed below in the *History and Settings Management* section.

To save a file press the **Save** button ( $\mathfrak{S}$ ). By default the file will be saved to the same location as the original Raw file, but you may specify another location with the **Save As...** menu. [See also the *History and Settings Management* section for setting this location manually.]

Normally RPP overwrites previously saved files. There is an option in the **Settings/** menu, however, to prevent overwriting: **Don't Overwrite Files on Save**. When enabled, RPP sequentially renames successive saves by adding a unique numeric suffix to the file name in range from 001 to 999.

A pull-down menu next to the **Save** button allows files to be saved variously as TIFFs or JPEGs (of selectable quality) using, where appropriate, Lab, BetaRGB, BetaRGB L\*, sRGB, or sRGBv4, ECI-RGBv2, or untagged mode. When an RGB color space is selected, the relevant profile is always embedded. 16-bit Lab is the recommended output space though since it preserves most of color information. In some cases for compatibility reasons an RGB space is a requirement and that's why I support multiple RGB spaces in addition to Lab. Typically BetaRGB is the recommended RGB space of choice for accurate processing. To see why this is so, see <http://brucelindbloom.com/index.html?BetaRGB.html>.

[See the *Changelog* below for version 3.6.6 for additional information on some of these profiles.]

You may opt to have a file opened in another application immediately upon saving. Use the pull-down menu under the **Save** button to make this selection. Photoshop and Bridge are the most obvious choices, but you may add applications to or remove them from this list. Apple's Preview is sometimes a convenient entry as well. See the *Integration* section below for more details.

To set white balance,  $\mathfrak{C}$ Click on some supposedly neutral area (and then **Apply** with  $\mathfrak{R}$ ). This takes a 3x3 pixel sample.  $\mathfrak{C}\mathfrak{C}$ Click takes a 7x7 pixel sample. You can select a larger region using  $\mathfrak{C}$ Click-Drag.

When you take a balance reading, the numbers in the Channel Balance boxes (R, B, G, G1) will change. These are relative EV numbers representing the relative differences in traditional exposure values between channels. For example, a 1.0 in red and 0.0 in green means that green is one full stop ahead of red so that red must be adjusted +1 full stop to make them balance.

You should watch the figures for both green channels. If they go off-balance you may get the "checker board" or "maze" pattern in your image after interpolation. This can occur if you've chosen an unlucky spot from which to set WB. Typically these values will be very close for Nikon cameras; for other cameras they can have constant second-green difference. This difference is camera- and model-specific and cannot simply be preset. I have attempted to automate the second-green adjustment and have, therefore, deactivated the second field by default. You may activate it by clicking the tickbox next to it, but you should leave it deactivated unless you know what you are doing. It significantly decreases artificial noise in images and makes them smoother without affecting details.

There are several ways you can transfer the white balance (and other settings) from one image to another. This is useful when you wish to apply the WB obtained from a gray-card to other images. Two of these techniques (using Propagate and Directory Defaults), best await the *History and Settings Management* section. But we can mention two others here (that require an unlock code): (1) the use of **Copy Settings**, found in the **Settings** menu, or (2) the use of **Export Settings As**, found in the same menu. Begin in either case by setting the WB (and any other desired settings) on your first (source) image. With method (1) select **Settings/Copy Settings** (⌘⇧C), then open a new image, and select **Settings/Paste Settings** (⌘⇧V) to apply the settings. With method (2), select **Settings/Export Settings As** (⇧⌘E) to save to your desktop a .rpps file (an editable text file of all the settings) that can be dropped on any newly loaded image to apply those settings.

You can obtain color information for points on your image using ^Click for a 3x3 sample or ⇧Click for a 7x7 sample. Both RGB and Lab values are reported along with their relative EV intensities in the boxes below the Histogram. The x-y coordinates of the sample are also shown. The color values will always reflect the current state of the color at that point.

Exposure increases or decreases EV by the indicated amount: +1 means one stop over and -1 means one stop under.

Compressed Exposure alters exposure while protecting highlights. It does this by compressing exposure values in the upper stops determined by the violet number in the small box. This is a generally useful means for increasing exposure, and has particular value in highlight recovery, as is explained in the relevant section below.

Saturation, Brightness and Contrast are just numbers. The controls do what you would expect.

Local Contrast is a technique to enhance image contrast at major boundaries. It is an effective way to add 'pop' to your images, but, at the same time, it can produce halos if overdone. So be careful.

Curve type allows you to choose a tone curve that is either **Film-like** (emulating certain color film), **L\*** or a traditional **Gamma** whose value is stipulated in the field below. There is also **Colorimetric Gamma** curve - this special item enables "colorimetric mode" in RPP, i.e. RPP will use traditional color management and

will be compatible with other colorimetric tools. You may need it with custom camera profiles made by external tools.

Blur Chroma applies a very mild blur to the Lab *a/b* channels to help decrease color noise.

Images can be rotated with the **Rotate Left** and **Rotate Right** items in the **Controls** menu. Image orientation can also be controlled through settings and Directory Defaults in the History Window (see *History and Settings Management* below).

## Integration

RPP may be integrated with other applications in several ways. For example, beneath the **Save** button is a selector (a drop-down menu) to choose an external application, if any, to be opened automatically with the image file when it is saved. You can add one or more applications by selecting **New** in this drop-down menu. Use **Delete** to remove a current application from the list.

A similar facility is available after running in batch mode (described below). RPP remembers the list of files that were saved during the last batch run. You can open all these files at once in the selected application using the menu item **File/Open last batch results** in the selected application (⌘U). (An unlock code required.) This list survives RPP restarts and is overwritten only when a new batch is run.

RPP also passes environmental variables each time an application or script is called. Specifically:

RPP\_INFILE: the full path of the loaded Raw file is given at a regular save.

RPP\_OUTFILE: the full path of the saved tiff or jpeg file is given at a regular save.

RPP\_CAMERA: the camera model is given at a regular save.

RPP\_BATCHRESFILE: the full path to an XML file listing all saved files from the latest batch run is given when and only when ⌘U or **File/Open last batch results** is used.

This auto-open facility has its most obvious value in allowing a file or a batch of files to proceed immediately upon saving to an application like Photoshop or some post-processing script. RPP can auto-open any application that is capable of handling the relevant image files. Adobe Lightroom may also be added to this list, but, in this case, its use will cause Lightroom to open its Import dialog, from which you can quickly import the converted image or batch of images.

For donators, there is a special Lightroom plug-in allowing you to open Raw files in RPP directly from Lightroom. This requires Lightroom 2,3,4 or 5 and an unlock code. Once your copy of RPP is unlocked, you can install the Lightroom plug-in from the **Raw Photo Processor** menu by clicking on **Install Lightroom plugin**. The plug-in will be installed along with a preset **Open in RPP** (see note below). This preset is not required, but it facilitates opening a Raw file in RPP from Lightroom: just select a Raw file in Lightroom, right click on it, and use the **Export/Open in RPP** menu item. You may also use **File/Export with Preset**. This works with one or several selected files (in which latter case it will run in batch mode.)

[Note: you may create this preset manually. Go to **File/Export**, select **Open Raw in RPP**, click the **Add** button, and provide a name. This may be necessary if you use the Lightroom preference "Store presets with catalog," which prevents RPP from installing the preset automatically.]

## History and Settings Management

The **History** button opens a History Window that displays the various setting states (records) associated with a particular file. This is an interface to a settings history database stored in `~/Library/Application Support/RPP/RPP.db`.

When you select a record in the History Window, its settings are shown in the History Panel to the right.

When you first open a file, you can see which record's settings were applied because the record is selected (highlighted) in the History Window.

You can edit the settings for a selected record simply by changing its values in the History Panel. You may also select multiple records and change some parameters all at once.

**+** button: creates a record containing all the current settings from the main Control Panel for the current(loaded) file.

**=** button: applies the content of a selected record to the main menu of the current file.

**O** button: opens the corresponding raw file with the given settings.

**-** button: removes selected records.

You may enter comments for a record in the text window at the bottom of the panel.

**Propagate** button: copies (duplicates) a selected record from a given file into many files at once. Use **⌘Select** to select disjointed files. This will work across different directories if the propagate dialog is switched to the list mode.

**Clean** button: deletes records from History for non-existing files in selected directories (use **⌘Select** to select disjointed directories). All records from History that point to non-existing files in those locations and their subdirectories will be deleted. [Take care with directories stored on external volumes. Their files will appear as non-existing if that drive is not mounted. Their file names usually start with `"/Volume/"`.]

Sort records according to columns by clicking the desired column heading (toggles ascending and descending). Resize columns by dragging column dividing bars.

The Search field at the top supports searching for records according to camera model, file name, comments, or destination. Click on the magnifying glass to select the kind of search. The selection type is shown dimmed in the search field. Then enter search text. The found items are displayed in the History Window.

When you open a file, the displayed list of records is initially filtered to show all records with the same file name (in any directory) and all relevant Directory Defaults. You may reset by using the search field and selecting any search type.

The records are color coded:

bold black for current file only

bold blue for Directory Defaults

gray for non-existing files

black for all others

**WB** drop-down menu: use this to change the **WB** of a record to **Auto** or **As Shot**. Previously stored custom values are retained and may be re-established by re-selecting **Custom**. [Note: the old trick of using values of 0 or 100 in the R,G,B fields for RPP versions before 3.9.0 no longer works. You must modify all old defaults and records in History with this new **WB** control. Sorry.]

The **Image Rotations** drop-down menu allows you to specify the orientation of an image. **As set by camera** uses the orientation data given by the camera's orientation sensor (when available). **CW** and **CCW** mean clockwise and counter-clockwise. **Ignore camera orientation** causes the camera rotation information to be disregarded; the image will be saved in native camera sensor orientation (usually Landscape). This can be of use when batch processing in an external application with custom resizing, framing, or other orientation-sensitive operations.

New records are always added to History in Custom white-balance mode. If, therefore, you wish to use some record for propagation or as a Directory Default, you will likely want to pick a more appropriate **WB** mode before doing so.

When you open a file, RPP looks for the latest (in time) settings applicable to that file from its History, starting from the most specific record containing the full path file name. If it cannot find an exact match, it looks through the Directory Defaults going from the longest to the shortest matching entry. Directory Defaults are used **ONLY** for files lacking exact records -- no matter when or how defined. Their purpose is mainly for new (previously unopened) files. [Note: this differs from the behavior of RPP versions prior to 3.9.0.]

To set the current settings of an open file as a Directory Default:

- (1) Press the **D** button from main window or select **Settings/Set current settings a Directory Default** (⌘D) to make the settings from the control panel become the default, or
- (2) Press the **Make Default** button from the History Window to make the selected record become the default.

Once set, a Directory Default becomes the default for the given directory and all its subdirectories: all files without exact records loaded from this directory or its subdirectories will use these settings.

Directory Defaults are always camera-model specific.

The white balance for Directory Defaults is best set to **As Shot** or **Auto**, but you can always change it in the History Window.

You can change Directory Default parameters by editing them in the History Panel. You can edit the file paths manually by double-clicking on the path, but always be sure the path ends with a '/' character.

As noted, creating a Directory Default makes it the default for the current directory and all its subdirectories. If you wish the Directory Default of the current directory to apply more generally to its parent directory (and all its subdirectories), simply select it and press **Make Default**. It will then become the Directory Default for the parent directory and the entire tree below it.

**Camera Defaults:** You may save the current settings as a global default for the current camera with the menu item **Settings/Set current settings as a Camera Default**. When a Camera Default is set, a History entry is created with '/' as its source. It is highly recommended that you define your own defaults for all your cameras. You will likely want to increase Contrast (e.g., to 2-5) or Black Point (e.g., 0.0-0.3). Most of modern cameras also require a Compressed Exposure correction of 0.7-1.0 EV.

A record's or default's destination path may be specified as a directory -- in which case it must have '/' at the end -- and, when this is so, the file will be saved to the indicated directory. If you specify a path starting with '/', it is treated as an absolute path. If it does not begin with a '/' but ends with a '/', it is treated as a relative path from the source-file directory. You can specify multiple directory levels and they will be created automatically if necessary. For example:

Source file: /Volumes/Pictures/Raws/Last Vacation/image.raw  
 Destination: /Volumes/Pictures/Family/  
 Converted files will be saved to directory Family on drive Pictures.

Source file: "/Volumes/Pictures/Raws/Last Vacation/image.raw"  
 Destination: "jpegs/small/"  
 Converted files will be saved to "/Volumes/Pictures/Raws/Last Vacation/jpegs/small/" and both "jpegs" and "small" will be created automatically if needed.

An empty value in Destination makes the destination directory the same as that of the raw file. The Destination column also has **Clear** button to clear the content of the Destination field in multiple selected records.

On opening a file, History records are selected as illustrated here: Suppose you have the following History with the most recent records on top:

1. /Pictures/2008/
2. /
3. /Pictures/2008/May/20/ABC.NEF
4. /Pictures/2008/May/
5. /Pictures/2008/May/20/ABC.NEF
6. /Pictures/2008/May/20/

If you load the file `/Pictures/2008/May/20/ABC.NEF`, RPP will use the most recent and most detailed matching record. In this case that would be number 3 even though there is another exact match at number 5.

If you try to load some other file, like `/Pictures/2008/May/10/DEF.NEF`, RPP will use the Directory Default at number 4.

With file `/Pictures/2008/May/20/GDE.NEF`, record number 6 is relevant.

With `/Picture/2008/June/15/QWE.NEF`, it will be number 1.

RPP will auto-save settings when you press the **Save** button or **Quit** RPP. Nothing is saved, however, if there have been no changes in the applicable stored settings.

Most buttons have shortcuts (hover over a button and you'll see it in tooltip). Here are some:

<b>History</b>	⌘⇧L
<b>+</b>	⌘I
<b>-</b>	⌘Delete
<b>=</b>	⌘Return
<b>O</b>	⌘⌘Return

Other shortcuts should also work (regardless of window -- for example, ⌘R is still **Apply** in the History Window).

Just below the Format button is the Destination Field. You may use this to set the destination directory for selected records: select desired records, enter a path name to destination directory (following the same rules given above), press Enter key. Use the **X** button to the right of the field to delete the destination from selected records.

The **Settings/** menu has a **Set Selected Settings from History** item. This applies the settings from the record currently selected in History -- even if the History Window is closed. You may use it to return quickly to some previously saved state. Usually the selected record is the last one added, but you may select another one and close History Window. That one will then become the one applied until you create a new one, which will then be the one selected.

Here is a simple usage scenario: You have set some settings that look good, but you want to try something different. Save the given settings to History with **+** button (⌘I) and try out different ideas. When you want to compare the new (current) state to the one you saved, just click the menu item **Settings/Set Selected Settings from History** (⌘Return), and it will apply them (unless **Auto-Apply** is disabled). Then you may use the **Show Previous** feature to toggle between them.

Another possible case: you have loaded an image with some settings, tried some changes without saving them, but now want to return to the original "as loaded" state. ⌘Return will quickly do the job. This feature is essentially the same as the **=** button in the History Window without requiring the History Window to be open.

The History Window can also be used as a Finder for images you have already examined. If you open RPP without an image (just double-click the application) and open the History Window, a complete list of previously examined images is displayed. You can then use the search option as desired to narrow the list. Select the file you wish to open and click the 'O' button.

In addition to the methods described in the *Basics* section for transferring the white balance from one image to another, there are a couple of techniques for doing this available from the History Window that you may find useful under certain circumstances. Begin by loading an appropriate image, say a gray-card shot, and take a white balance from it (making also whatever other settings you wish to transfer). Then you may either (1) press the '+' button to create a History record with these setting and, from the History Window, use the **Propagate** button to add this record to any other selected images, or (2) use the **D** button to cause the current settings (including WB) to become the Directory Default to act as a starting point for all other images in the same directory.

In some cases when Auto white balance has to be used you may want to lock same automataclly calculated WB value for an entire directory (f.e. CinemaDNG processing). **Auto WB Lock for directories** button in the History window allows to do this automatically for many directories (footage clips) at once. You can specify any directories in popped Open dialog - RPP will load first Raw files from each, calculate Auto WB from it and make directory default for the entire directory. It will scan all subdirectories in selected directories.

## Presets

RPP allows you to create your own custom presets. Click Presets pop-up button (top of the panel) and choose New... to store your current settings. RPP will ask for a name and save it for future access from the same pop-up button. You may also delete currently selected preset by choosing Delete item.

Presets are stored in Library/Application Support/RPP/Presets directory as separate text files with extension .rpps and you may edit, remove or add new ones there in Finder.

## Batch Processing Mode

The batch-processing mode relies heavily on the History feature discussed above in the *History and Settings Management* section. Think of batch processing as a robot that sequentially loads files from a list, processes each as it goes, saves it, and moves on to the next. The settings applied to each during processing are determined from the History for that file. Let us examine some important ways in which this feature might be used.

The simplest case: launch and lunch. Go to the **Open** dialog, select several Raw files, and click Ok. Or, select one or more directories. Or drag-and-drop a group of files and/or directories onto the RPP icon while holding ^-⌘. RPP will scan selected directories at full depth (all levels of subdirectories), selecting all their Raw files and skipping any non-Raw files. Any mix of selected files and/or directories will work. Whenever you pick more than one file, or a directory with more than one file, RPP assumes you wish to batch-process

them and proceeds to load, process, and save the files one by one. A progress bar at the bottom keeps you informed, and near it is a **Cancel** button. If you click it, the run will stop as soon as current file is completed.

Another mode is invoked when you use **Run Batch** button in the History window. In this case column Source File from selected records acts as a key for finding files to process and corresponding settings in each record will be applied to matching files. If Source File contains single Raw file reference only this file will be processed with setting from the record. If it contains a directory name - the whole directory and all it's subdirectories will be scanned and all Raw files from there will be processed with single set of setting from this record. If you select multiple records with combination of single files and directories all of them will be processed according to corresponding settings. Column Camera acts as filter in this mode, i.e. only files from this camera will be processed, however you can manually clear it out (double click and delete completely) and such record will ignore camera and process ALL matching the Source Raw files from any cameras. The purpose of this mode is to avoid any settings selection logic described in History and Settings Management chapter and simply produce conversions with guaranteed set of parameters.

RPP remembers the state of a batch run, and if you **Quit** (⌘Q) or if it crashes, you can resume the run from it's last position. RPP prompts you at the next launch if an incomplete batch is detected. During the run, the previewed image is not be updated, but there is a counter in the title bar of main RPP window and the settings for currently processed file are displayed. If you want to see how an image will look once processed, simply load it as a single file before starting the batch run.

The next case: pick settings now, save later. Suppose you have a group of images that you want to process manually, one by one. Do so, making all desired settings and picking output characteristics (color space, quality, etc.) and format (TIFF, jpeg). But now, rather than pressing **Save**, press the **+** button (⌘I) to make these settings the current record in the file's History. Then, when you make a batch run of this group, RPP will pick each file's settings for use in conversion. A batch-run like this could take a while, depending on the requested output quality, camera resolution, and number of files. But it will be faster than pressing the **Save** button for each image because the batch mode doesn't waste time processing previews.

Another case: group processing. After a busy day of shooting you have several groups of pictures from different lighting conditions. Create a subdirectory and establish settings for each group. Do this by loading a 'typical' shot from the group, set white balance, exposure compensation, and other settings, along with output format and resolution. When you are satisfied, press the **D** button. This will make your current settings the Directory Default for that subdirectory. These are the settings, then, that will be applied to all files in that directory when it is subject to a batch run.

Let's make this case a bit more complex. Suppose you've created a Directory Default as above, but you have few tricky files that want individual attention. Simply load them individually, change their settings as desired, and press the **+** button (or ⌘I) to make those settings the currently selected record in History. Then, when they are processed in the batch run, their custom settings will be applied while the settings from the Directory Default will apply to the others.

As a final leap, once you've created a Directory Default, you can make it a Super Directory Default, covering multiple subdirectories. Select a Directory Default in the History Window (they are in bold blue) and press the **Make Default** button one or more times until it rises in the directory tree to the level you want. You can see what level it is at by looking in the Source File column. Each time your press **Make Default**,

the lowest level is removed. But be careful here or you may end up making the Directory Default apply more broadly than you wish (there is no undo for this operation).

If you do not wish to create different directories and multiple Directory Defaults, you may propagate some settings to many files at once. Load a file, adjust it, create a History record for it ('+' button), and then, from the History Window, select this record (if it is not already selected) and assign it to a number of files at once (without opening them) using the **Propagate** button. This opens a navigation dialog, which perhaps works best in Icon view for this purpose. Select the desired files (use ⌘Select for disjointed files) and press Ok. RPP then inserts the desired record for each of those files. In using this approach, you may encounter gray records, i.e., records pointing to erased Raw files. You may clear them from your History with the **Clean** button. Specify one or more directories, and all records for non-existing Raw files in them will be deleted.

The preceding are just suggestions about how the batch mode can be used. It is really quite flexible and, after playing with it, you will likely mold it precisely to your needs. I make a very simple use of batch processing to generate preview jpegs after shooting. I place the images in a single directory and set a Directory Default to something safe and reasonable in Half resolution mode and 85% jpeg quality. This does well enough to give a quick first pass for 'keepers.' One hint: you may want to specify **Auto** white balance (if you haven't been trying to set WB during the shoot) or **As Shot** (if you have) in the Directory Default entry.

## Histogram

The Histogram is among the most important tools in digital image processing. RPP supports four different histograms at the moment: channels R, G, B and L\* (from Lab). Any channel may be turned on or off with its tickmark below the graph. The R, G, B densities are displayed relative to the current output space. This is usually BetaRGB, but you may choose another in the format menu (the pull-down menu at the bottom of the panel - or ⌘F). The L\* channel is Lightness from CIE Lab color space.

The Histogram shows the pixel densities (vertically) for each R, G, B, or L\* level (horizontally). Normally the Histogram displays these values for the entire image, but if you select a region (Click-Drag) in the image, the Histogram will be calculated only for that region (in real time -- you can drag the selected region around with the mouse).

The Histogram has three scales: the L\* scale (in 10 steps), the EV scale (in steps of 1/3 EV), and Ansel Adams' Zone system scale (zones 0 to 7).

The L\* scale is the thin black and white stripe on top of the Histogram with L values above it.

Adams' Zone scale is represented by the alternating dark-gray and black vertical bands in the background, each labeled with its corresponding Roman numeral. You can use this scale in conjunction with the color-picker/region-selector tool to adjust the densities of critical parts of the image. Caucasian faces, for example, are typically placed somewhere in zones V or VI. And, rather more generally, these two zones are best for detail perception. An article that describes how this classical zone system can be used in digital photography is to be found at <http://www.libraw.org/node/43>. You will find other articles of interest on that site.

When you select a region while holding the  $\wedge$  button, positive and negative EV numbers are displayed at the beginning boundary of every zone in the Histogram. These gold-colored numbers indicate the approximate amount of correction required to bring the average of the selected region (represented by the thin gray vertical line created by the color-picker) to the beginning of that zone. You can enter that number in the Compressed Exposure field, or, more simply, you can click on the number in the Histogram, and RPP will add the value automatically to the Compressed Exposure field. If you hold the  $\hat{u}$  key while clicking, it will add to that amount exactly one-half zone more, thereby aiming for the center of the zone.

At the very bottom of the Histogram is the EV scale. Long ticks represent 1EV steps (one full stop). Short ticks represent 1/3 EV steps. This scale changes with each change in conversion parameters (brightness, contrast, etc.), always showing how the densities are currently distributed over the range. There is one special mark that is a bit taller and thicker than the others. It represents the 12.5% mid-tone point. The meters of most modern cameras are calibrated to this value.

[Power users tip: you may redefine this value in Terminal. To set it to the older 18% standard, for example, enter:

```
defaults write net.tigry.rpp GrayPoint 18
```

To return to the 12.5% default, enter:

```
defaults delete net.tigry.rpp GrayPoint
```

```
]
```

When making EV/exposure adjustments based on values determined by the color-picker/region-selector tool ( $\wedge$ Click or  $\wedge$ Drag), you may use any of the vertical lines for the R, G, or B channels, but don't use L\* for this. Usually the green channel is best for this purpose, but if some other channel is stronger, that might be the better choice. When precise exposure adjustments are required, you should disable Local Contrast and Sharpness (use the small tickmarks next to them). It may also be helpful to know the EV values for the selection. These are given in the information panels just below the Histogram.

It should be noted that these histograms can be made to depict the actual raw data, prior to transformations such as white balance and demosaicing -- the so-called raw histograms. Simply select some Raw RGB TIFF output option, set the curve type to gamma, and zero-out the R, B, G1, G2 fields (or, more simply, select UniWB). Unlike some software that displays the raw histograms, the two green channels are not shown separately here. Applying a gamma of 1.0 results in a distribution that reflects that originally on the camera's sensor, but using a gamma of 2.2 would typically provide a more useful distribution for examining the raw data. These histograms are particularly useful in assessing whether any clipping, especially in a given color channel, has taken place during exposure as opposed to clipping that may be introduced by applying a white balance or converting into a particular color space. Those who find frequent need for this feature will benefit from creating a preset (using the Presets button) incorporating the appropriate settings.

## Selection

RPP supports some selection-based operations. To make a selection, simply click and drag. To remove a selection, click outside of it. You may move a region by hold-clicking in it and dragging.

The Histogram is calculated for the content of the current selection, if there is one. Otherwise it refers to the entire image.

When the color-picker information is determined by a selection (^Drag), the values are averages over the selected region. This also applies to white-balance calculations determined over a selected region (⌘Drag). This feature often produces good white balance even if you select a large colored region.

## "Copy Tags" Option

Activating **Copy Tags** allows the internal tags from the Raw file to be transferred to the destination image when saved. At the moment RPP saves information in 3 different formats:

1. EXIF: shutter speed, aperture, ISO, lens, and original time stamp.
2. Maker notes: proprietary blocks of internal information created by camera vendors. This format contains much detail, but only some tools are able to decode it. ExifTool is one of them.
3. XMP: an open format, like EXIF, but more advanced and more comprehensive. This format is supported by many applications like Photoshop, Preview in Mac OS 10.5, and others.

[ACR note -- especially for DNG files: if you try to open files in Photoshop that were saved by RPP with the Copy Tags option and find that they are opening in ACR instead, disable the ACR options for both JPEG and TIFF handling (when ACR is launched, press ⌘K; the options will be at the bottom of the preferences panel). It is undesirable to open RPP-processed files in ACR. I am making efforts to prevent ACR from intercepting RPP files. Please report this problem to me if it continues to happen.]

Should you have problems opening an RPP image that has copied tags in some other application, try to open the same file converted and saved without this option. If that version works, please report it to the application vendor and to me.

## Gamut View

This 2D diagram displays the color values of the pixels of the current image projected onto the *a* and *b* axes of the CIE Lab space (which comprises the entire Gamut-View square). The L value is adjustable with either the slider or the input field. Also shown are the boundaries for the gamut projections of up to two color

spaces: the red one is the current output space (defined in the Format selector at the bottom of the main panel) and the green one (not always present) is whatever custom profile you select with the **Set** button (such as your printer profile). The custom profile may be reset to **None** by clicking the **Set** button while holding the  $\backslash$  key.

When **Full Gamut** is not selected, the graph shows only those data for the current L value, and you may observe how they change with L by moving the slider. This is the correct way to determine if your image fits into some gamut: just move the slider from 0 to 100 and check that the colors do not cross the gamut border or get too close. When **Full Gamut** is selected, you view the whole gamut as seen along the L axis from top. This is a projection of the entire 3D space onto a 2D space, so it can be very misleading. Never judge whether your image fits into a gamut by this projection alone!

Gamut View supports selections the same as the Histogram does: if a region is selected, the data pertain only to the selection. Otherwise they pertain to the entire image.

The Gamut View is often helpful in determining how to adjust your image. It is quite useful, for example, in making a proper saturation adjustment. Typically we want as much saturation as possible, but pushed too far, the colors cross the gamut border and color details are lost, resulting in a flat, lifeless patch of color. Inversely, if we are overcautious, we lose the ability to exploit the full color-reproducing capabilities of our output devices (monitors, printers), and our pictures lose vivacity and verve.

Monitors, even good and expensive ones, may not help us here because they have their own color space, close to AdobeRGB at best, which is very different from a printer's color space. They may overlap some, but not completely. The Gamut View can help here. Set your printer/paper profile to be the custom gamut. Then adjust saturation till the data fill the printer space as much as possible without going out of bounds (use the slider to check all L values). Even if the preview now looks blown at some places on your monitor, it will look fine when you print using the same printer profile. Here then are the steps for pre-print preparation (assuming that you have an appropriate profile for your printer and paper):

1. Adjust your image as you normally would.
2. Click **ChD** button ( $\text{⌘} \uparrow \text{D}$ ) to enable the Gamut View, and set your custom printer profile if needed. For web, choose the sRGB space.
3. Turn the **Full Gamut** mark on and adjust saturation till your image data get close to a border, but allow nothing to cross.
4. Disable **Full Gamut**. Set the slider to 0 and start moving slowly up to 100. Observe whether any colors cross a border. If they do, stop at that point and decrease saturation till the data fit. Continue sliding, decreasing saturation where needed. When you reach 100, you'll have an image that fits perfectly into both output and printer spaces.

Tips:

In general you should choose an output space that is larger than your printer space, covering it completely or almost so. If you pick Lab you are safe here; it is the biggest one. BetaRGB is a good choice if you definitely want to process further in RGB, but otherwise printing right from Lab is safer.

Take care not to do color-space conversions that cut into your printer space.

Saturation is not the only way to affect gamut: all settings that effect color changes do this. Sometimes you may be better off changing the tonality of an image (for example, with cold-warm) to shift colors a little so they fit.

You may notice that, if you disable the Blur Chroma option, the graph changes a lot. These differences mainly reflect color noise and moire, so the graph is actually more correct when the option is on. The Blur Chroma option filters out these kinds of effects.

While the steps above guarantee a good fit of your image data to your printer's profile, they may be overly stringent and result in a dull image. If this happens, you need to do some careful checking. It could be that the out-of-bounds data are in inconsequential shadows (at low values of L) or spotty highlights (at high values of L). Furthermore, the Gamut View graph does not account for the frequency of any color value. A single pixel or a thousand pixels of the same color will be displayed as a single dot. It could, therefore, be the case that the out-of-bounds data refer only to a small number of pixels in the image. In these cases you could certainly consider stronger saturation if it is otherwise desirable. It is not easy to determine when situations like these arise. Use of the color-picker (^Click) in shadow and highlight regions can help assess the situation.

## Exposure

Prior to version 3.7.1, RPP applied auto exposure correction based on the green channel to all images by default. Now, however, images are displayed exactly as they were captured. This is a substantial change in behavior, and it means that the RGB histograms in RPP and your camera should look similar over the entire range. It also means that if your image is underexposed, it will look underexposed in RPP by default, which you may find disconcerting -- but RPP is only telling it like it is.

To make an auto exposure correction, press the **Auto** button next to the Exposure field. This will produce the same default look as versions before 3.7.1, i.e., auto correction based on the green channel. If you click this button while holding the  $\backslash$  key it will effect auto exposure relative to the strongest channel. This can be useful if you wish to avoid clipping in any channels. The following section *Compressed Exposure Correction* provides an alternative, and often better, method to achieve this end.

The application of negative Exposure correction can produce coloration (pink or other tints) in regions of blown-out highlights. This is expected behavior resulting from the preservation of information in the non-blown channels, information that can be useful later in post-processing. If you would rather not have this coloration, reduce exposure instead by using negative Compressed Exposure (CE) while keeping regular Exposure at 0 or some positive value. Negative CE correction is designed to prevent this kind of coloration.

## Compressed Exposure (CE) Correction

This control is similar to the usual exposure correction in that it adjusts the exposure of an image, but instead of clipping highlights that would become 'overexposed,' it compresses them in a specified range. To this end, it has two input fields, one inside the other. The smaller one specifies the upper range in which compression will take place, and the larger one specifies the amount of correction to be applied (both fields are in EV units).

The second field is interchangeable with the regular Exposure field. You may redistribute values between the two and the overall tonality of image shouldn't change -- except in the specified compression range (the small field). This means that you can apply more exposure correction to an image without clipping highlights.

This control is quite beneficial in Highlights Recovery (discussed in greater detail below). After the exposure is reduced to restore highlights, the image will typically look badly underexposed. But, if you add to Compressed Exposure an amount that just compensates for the reduction in regular Exposure (enter the value from the Exposure field into the Compressed Exposure field without the '-' sign), you'll have a properly exposed image without clipped highlights. There are pictures on the [Examples](#) page that show this effect.

CE is usually recommended for negative exposure corrections. It works the same way as regular Exposure correction, but avoids producing colored highlights in overexposed areas (for example, pink or purple clouds). See the relevant part above in the *Exposure* section.

## Black Point

The Black-Point adjustment in RPP alters the black point with a film-like roll-off to avoid rough shadow clipping. When the black point is raised, shadows are compressed instead of being cut off. This allows fairly large corrections to be made without ruining an image. The scale is in percentages; zero means no correction and 99 means an almost entirely black image. In most cases even a small black-point correction does much to raise contrast. Values in the range of 0.1%-1% are usually enough. Negative values, which will lift shadows, are also allowed.

## Simulation mode

RPP includes special profiles to simulate various photo films from such vendors as Kodak, Agfa, Fuji, Ilford and some papers. Some of these profiles are purely digital effects. The selector is located next to the **WB** button (or press ⌘L). These profiles can have a substantial impact on the image (relative to your defaults),

so you should select it first and then readjust your settings as required. With B&W profiles, the tonality and contrast depend greatly on the Saturation and White Balance settings. Different settings can help to reproduce the effects of various optical filters.

## Sharpness

This control is a bit tricky. It is virtually impossible in RPP to adjust sharpness properly because the actual result cannot be previewed at fully interpolated resolution. However, I really wanted to have this feature :). So I devised a workaround: perceptually adjusted sharpness. Use the Sharpness field to adjust sharpness with the **Zoom to Fit** option disabled. After conversion, the final image should perceptually look equally sharp at a 100% view, even though it will have a higher resolution.

Try it, and let me know if it works for you. If you don't want it, put 0 in the Sharpness field. You can also use the tickmark near it to disable Sharpness temporarily. This expedient is temporary, and it will not affect batch mode or be saved in History. But it does affect the preview and the resulting image if saved.

Rather generally I recommend applying no sharpening (put a 0 in the field) to files you intend to process further in some external application. The sharpening could otherwise interfere with your post-processing.

## White Balance Presets

RPP supports three kinds of WB presets: built-in, camera-vendor, and user-defined.

Built-in presets are hardcoded white-balance values for these cameras: Nikon D3X, D3, D700, D2X, D2Xs, D300, D90; Fujifilm S5 Pro; Panasonic L1, LX1, LX2, LX3, FZ8, FZ18, FZ30, FZ50. There is also a special one for UniWB for all cameras that disable white-balance correction and allow images to be seen exactly as the camera sensor sees.

Vendor presets are provided by some camera vendors in their Raw files, and, if RPP can find them, they are automatically included in the WB pull-down menu. Unfortunately not all cameras provide this information. Raws from most of Canon, Pentax, and Olympus cameras have it.

You may also define your own presets. To preset WB settings you have established, simply select **Settings/Create WB Preset**, give it a name, and it will appear in the WB button. You can delete the current WB preset with **Settings/Delete current WB preset**. An effective way to create a preset is to shoot a gray card in appropriate lighting, take a white balance from it, and save it as a preset. For example, you can create presets for common conditions like daylight, cloudy, tungsten, fluorescent, and so on. User-defined presets are typically more accurate than built-in or vendor's presets.

For information on setting WB from a gray card in specific situations, see the relevant parts of the *Basics* section and the *History and Settings Management* section.

## Highlights Recovery

With this tool you may try to restore blown highlights in Raw files. There are, however, several requirements:

1. It works only if you have at least one truly blown channel.
2. It works only if you have at least one informative (not-blown) channel.
3. Overexposed areas, if multiple, should have had similar tints in the actual scene. For example, different parts of gray clouds could qualify here, but not faces and clouds, which have differing tints.

It is important to get a proper white balance before attempting Highlights Recovery. If the overexposed area was originally gray, you could take a white balance from a properly exposed surrounding area (assuming there is no better means for establishing WB), but do this *before* enabling Highlights Recovery. If the overexposed area was not neutral (like clouds at sunset), it is still possible to recover them, but you must first set a proper white balance one way or another to get correct colors.

By the very nature of the problem, Highlights Recovery requires an application of negative exposure to make room for the restored data. If, for example, your image is overexposed by  $2/3$  EV, at least  $-2/3$ EV exposure compensation will be needed. When you tick the **Enable** box under Highlights Recovery, RPP will automatically determine an appropriate exposure compensation. In the above case, it will apply about  $-2/3$ EV if your Exposure was at 0, but it will not change the value if you had already applied  $-1$ EV. After enabling Highlights Recovery, some gray splotches should become visible in the overexposed areas. [Note: If this doesn't happen, try adjusting the HR value downwards. If you still don't get any gray areas, then you didn't meet conditions 1 and 2 above.]

For neutral areas, start increasing the value of the HR field until the splotches and the surrounding area blend completely. This is most easily done using the keyboard. Select the field and use the Up/Down arrows for adjustment. [See the *Untagged Mode* chapter below for a useful speed tip.] You may type in values manually for higher precision. Also you can use mouse scroll wheel or trackpad scroll gesture to spin values up or down while hovering over field and some selectors.

If the overexposed area was not neutral, try enabling the **Guess Tone** tick and adjust the HR value until the restored and surrounding areas blend. The success of this feature depends very much on meeting condition 3.

After you have achieved a good blend, you may adjust exposure to a more appropriate level. The restored areas should remain blended. One of the best ways to bring exposure back into line is simply to add to Compressed Exposure an amount that just compensates for the reduction that was made during HR to the regular Exposure (enter the value from the Exposure field into the Compressed Exposure field without the '-' sign). This will bring the exposure back without reintroducing clipped highlights.

You may also try to compensate by increasing Brightness until the mid-tone mark is somewhere in the range of 50-60 on the top L\* scale, and then apply contrast to counter the dull look. This too will effectively compress highlights without introducing clipping.

An image produced with the Highlights Recovery option enabled should always be reviewed at 100% zoom after saving. The recovery process can produce hard edges around the recovered (previously clipped) areas and some blurring of them may be required in post processing to smooth the transition.

## Untagged Mode

RPP switches to this mode when you select one of the two untagged RGB TIFF formats in the Format menu at the bottom of the main panel (⌘F). This is a special mode that disables all color management and dependent features. As a result, it is much faster. Colors in this mode are always displayed incorrectly, but it is still useful in some instances. For example, each **Apply** during Highlights Recovery goes much more quickly in this mode.

Despite the fact that colors are not displayed correctly on your monitor in this mode, the color values are correct representations of your Raw data, unaltered by any profiles. Untagged mode, then, is the proper mode for using with the camera profiling facility (described below). When you enable **Window/Camera Profiling**, RPP automatically switches to the Raw RGB TIFF 16-bit format that is best for this purpose.

When you enter untagged mode, all incompatible controls are disabled. But you may still make use of whatever remains active. You should use the same curve type in untagged mode that you wish to use in regular mode.

## "Optimize for Post-Processing" Option

This is a special option under the **Settings/** menu for advanced users. When enabled, the text 'Save' on the **Save** button becomes blue to remind you that the option is active. This option causes the image, when saved, to be compressed over its entire range to leave 5% empty space in both the shadows and highlights (10% total) and to have its saturation decreased by 10%. The image saved this way will look different from the way it looked in the RPP preview; it will be duller and less colorful. This option helps eliminate one step during post-processing when compression becomes necessary to prevent curves or other tonal/color operations from causing highlights or shadows to clip. So while this compression could be done in an external image processor, it is better to do it in RPP, which can accomplish the task with higher precision and less loss. This is a global option that affects all saves, including those in batch mode.

## Remove Dot-Noise Option

This option should remove single-pixel noise artifacts. These are mostly "hot pixels" but could include "dead pixels" and bright dots in shadows at high ISO. It may also catch some tiny specular highlights. This option is not, and does not behave like, regular noise filtering; it affects only single pixels and does not affect overall detail.

## Multi CPU Processing

As of version 3.7.9, RPP supports parallel processing on appropriate platforms.

Most recent Macs use the Intel Core Duo processor that has two CPUs on one chip. RPP uses both to full strength. Older PowerPC-based dual-G5 systems will also benefit. Even older dual G4s should show better performance.

For systems with more than two CPUs (currently some quad-core iMacs, the Mac Pro and Power Mac G5 Quad), RPP uses only two CPUs by default. But donators can receive an unlock code to enable support for all available CPUs -- among other things. This provides a huge performance gain in previews and file saving. If, for example, you have an eight-core Mac Pro, RPP will perform about 4 times faster -- and even more with some operations.

I am very interested in your feedback vis-à-vis performance gain and any and all troubles that may arise. I would appreciate your contacting me with these issues.

## Workflow Helpers

There are several controls in RPP that help to simplify your workflow. These features require an unlock code.

The **Next** button (also **File/Open next Raw file in current directory** - ⌘N) opens the next Raw file in the current directory (if there is one). The current directory is one containing the currently open Raw file. It is necessary, therefore, that you shall have opened at least one file from this directory, and then you can go through them sequentially. Non-Raw files will be skipped.

The menu item **File/Open previous Raw file** (⌘P) does the same for the previous file.

The menu item **Settings/Automatically open next Raw file after Save**, when checked, causes RPP to load the next Raw file in the current directory right after saving the current file.

The menu item **File/Move current file to Trash** (⌘Del) moves the current file to the Trash and opens the next available Raw file in the current directory. If the deleted file is the last one in the directory, RPP tries to open previous Raw file. If no Raw files are left in the directory, RPP switches to panel-only mode.

The menu item **Settings/Maximize window for opened files**, when checked, causes RPP to maximize its window size after opening each Raw file.

The Previous Variant (PV) mode is entered when you click the **Show Previous** checkbox (⌘) at the top of the panel. RPP remembers the image and settings of the previous rendering after an **Apply**, and you can revert to it with this checkbox to compare it to the new state. Some controls are not available when in the PV mode. For example, there will be no picker or selection-based information available and no Gamut View. But the rest of the controls should work as usual. If you **Apply** new settings while in the PV-mode, they become "current" and the previously current settings become "previous." All controls will again function as usual. A usage example: suppose you have set WB on an image and decided to try another. You set it and click **Apply**. Now, you can repeatedly press **Show Previous** (⌘) to toggle back and forth between the two to see which one you like better. If you like the old version better, just hit **Apply** while in PV-mode and it will become current again with all controls available as usual. This feature also works with variants opened through **History**. The History variant will become the current one and the rendering it replaced becomes "previous." Toggling **Show Previous** allows you quickly to compare them and choose your preferred version. RPP does not store "empty" Applies, those made when no settings have been changed.

The menu items **Settings/Copy Settings** and **Settings/Paste Settings** allow one, respectively, to copy all the current settings to the clipboard and paste them back to RPP or to a text editor. When they are pasted back to RPP, they are applied to the currently open image. [Note: this is a simple way to transfer the WB from a gray-card shot to another image taken with the same lighting.] The copied settings can also be pasted to a text editor or to an e-mail for future use or for sharing. Once in a text document, they may be copied and pasted back into RPP to be applied to the current image. The settings that are copied and pasted use easy to understand plain text format.

The menu item **Settings/Settings Selector** allows you to enable or disable specific setting for copying. For example you can disable white balance from being copied. This panel applies only to **Settings/Copy Settings** and is also shared with **New Preset** creation dialog.

The menu items **Settings/Export Settings** and **Menu/Export Settings As** are similar to the above Copy/Paste items, but instead of being saved to and read from the clipboard, the settings are saved with the same format to a text file (with extension .rpps). **Settings/Export Settings** saves the .rpps file to the same location as the converted file would be saved. **Settings/Export Settings As** allows you to specify the location for the saved .rpps file with a standard file-navigation dialog. The .rpps file may be imported into RPP (and applied to the current image) in several ways: you may use the **Open** dialog, or drag-and-drop the .rpps onto the RPP icon, or simply double-click the .rpps file. The settings will replace the settings of the current image.

There are also two items in the **Settings/** menu to export and import multiple settings at once for multiple files and directories. For export click **Export Multiple Settings...** and choose directories and files you want settings exported for. RPP will scan those locations for any Raw files and export their settings as sidecar

files with original file name and added extension .rpps. In this case .rpps files will always be stored in the same directory with the original Raw file. After this you can move or archive whole directories to another location including those freshly created .rpps files and import them back to History with **Import Multiple Settings...** item. It works the same way - you pick files and directories to scan for .rpps files and RPP will import them back. RPP will pick only .rpps files which have name exactly matching Raw file. F.e. for file Picture.CR2 .rpps file should be named Picture.CR2.rpps to be imported. This is how RPP would create it in first place.

The .rpps files may be edited in any text editor. This is useful, for example, to remove entries that you do not wish to be modified (only the included entries have effect during the import). But please follow the format, which is simple and easy to understand plain text. It's case sensitive and only one setting per line is allowed. To get the idea copy any settings in RPP to Pasteboard and paste them to some plain text editor.

## Camera Profiler

RPP has a built-in facility, which requires an unlock code, for generating camera profiles. This feature relies on the ArgyllCMS (colprof profile generator and CGATS library) written by Graeme Gill, a very powerful set of free open-sourced libraries and command-line tools for color-management related tasks. The colprof executable is installed with RPP automatically for your convenience, but you can download the full tool set from the author's web site. These tools are highly recommended to all advanced users. The .ti3 files produced by RPP are standard and can be used to generate other kinds of profiles by colprof. To learn more about ArgyllCMS check this website <http://argyllcms.com/>

With RPP's integrated camera-profiling facility, you can generate custom profiles for different lighting, lenses, and filters (in particular, polarizing and color-compensation filters, which significantly affect a camera's color response). To use the profiler, load a target image (see the next section on how to make this image) and select the menu item **Window/Camera Profiling**. RPP can work with any target image for which you have a standard IT8.7/2 profile template with extension .cie. The file should contain measurements of the original target patches made with a spectrophotometer or other color-metering device capable of Lab or XYZ values. The order of the patches in the file is important; it will be followed by profiler during the target sampling. The .cie profile template for the regular ColorChecker 24 target is built in to RPP and is always available. This template is appropriate to use with the traditional ColorChecker 24, the Mini ColorChecker, or the XRite ColorChecker Passport.

Sampling should always be done while RPP is in untagged mode (untagged RGB TIFF 16-bit). RPP automatically enters this mode when you select **Window/Camera Profiling**, and it also switches all settings to their default values except for white balance and exposure, which may have been adjusted before calling the Profiler.

Iiah Borg's suggestions for capturing the target are given in the next section.

To profile your camera, follow these steps:

1. Load the target image. Set the format to Raw RGB TIFF 16-bit in the Format menu (at the bottom of the panel - ⌘F) or open the profiler with Window/Camera Profiling, which will automatically place you in this format). Be sure that RPP is set to the curve you want to use (usually it's film-like) and all other settings are in their default states. Disable Zoom to Fit to make selections on the patches easier.
2. Set the white balance using a gray patch on the image. With the ColorChecker 24 pattern, the lightest gray (patch D02, next to the white patch) is typically recommended. ⌘Drag a region in the center of the square to get a stable reading. When selecting regions, stay away from the patch edges.
3. Check the exposure of the white patch (^Click or ^Drag). Its RGB values should be in the range of 248-252. You may increase exposure a bit if necessary to achieve this level. Use regular Exposure, not Compressed Exposure, for this purpose. If an increase of more than one-half a stop (+0.5) is required, your target is underexposed and this will adversely affect quality of the profile. [It may still work for you, but a better exposed image is recommended.]
4. Check that the target has been evenly lit. This is the most important factor in the profiling procedure and it should receive significant attention. The *Lighting and Capturing the Target* section below, by Iliah Borg, provides suggestions and details for doing this properly. If the target lies on a gray card as Iliah suggests, take readings (^-Click or ^-Drag) on the card near the four corners of the target. The readings should display little variation in RGB values; the readings are acceptable if they are closely clustered in a 6-point range (although the narrower the range, the better). If you did not use a gray-card behind the target, readings from the target's black border may serve, but on targets like the Passport, this border is textured and may not be suitable for this need.
5. If you did not already do so in Step 1, open the profiler by selecting Window/Camera Profiling. In the profiling window, fill in the Description (top field) and Copyright Statement (second field) with meaningful information -- especially the description, which will help identify the profile in the future. RPP pre-fills this field with the camera model, ISO, and file name of the target shot, but you can modify it.
6. Select ColorChecker 24 from the template pull-down menu or load your own Custom profile template (.cie file) if you have one. Custom profile templates that are placed in the folder ~/Library/Application Support/RPP/Profile Templates/ will appear in the pull-down menu for selection. The text box to the left of the pull-down menu confirms the name of the target definition that is selected. [After changing templates, click the Restart button to reinitialize the profiler.]
7. If you wish to generate a profile from a previously created (and saved) .ti3 file, you may load it with the **Import TI3** button. This is optional and would not be used if you are sampling a target anew. The text field to the left of this button displays the name of the .ti3 file that is either being imported now or will be named later in the optional **Export TI3** save dialog after the sampling is complete.
8. Check **Enforce white** and **Enforce black**. You would turn one or the other of these off only if you have 'real black' and/or 'real white' patches in your target. Standard targets, like the CC24, do not.
9. Now you are ready to sample your target. The **Patch to Select** box gives the ID of the patch to be sampled and, next to it, a view of the expected patch color. This expected color could differ somewhat from the color of patch you see on your monitor, but it is usually quite easy to match. You must know your patch-

ID pattern in advance. For CC24, for example, there are four rows, A, B, C, and D, and six columns, 01-06. You sample the six patches in row A first (left to right), then row B, etc., ending with row D, the row of grays.

10. Drag-Click inside a patch to select a sampling area. Avoid dust spots, blemishes, frames, edges, shadows, or other imperfections. A smaller selection is fine. When you release the mouse, RPP will snap a sample from the selected area, and you should see the resulting numbers in the large text box. The **Patch to Select** box will now show the ID of the next patch to select and a view of the expected patch color will be displayed next to it. If your hand slips or something goes wrong, you can redo the last patch; click the **Resample Last Patch** button (the **Patch to Select** box will update), and do it again. You need not reselect every patch with separate Click-Drags. You can Click-Hold an existing selection and drag-and-drop it from patch to patch. As soon as you release the mouse button, it will sample the area.

11. Continue until you have sampled all the patches. At this point RPP will display the message "All patches are sampled" in the large text box. Pay attention: don't skip patches and don't sample them twice.

12. Now you can click **Generate and Save Profile**. You can opt to save it anywhere, but if you choose RPP's standard profile folder `~/Library/Application Support/RPP/Profiles`, RPP assigns the new profile to your current image automatically and, when you close the Profiler (**Exit** button), it refreshes your image so you can see how the profile works with it. Before exiting, you can also opt to export the `.ti3` text file that contains your sample information (**Export TI3**). This is optional, but if you do save it, you can import it later (**Import TI3**) to (re)generate the profile without having to resample its target.

13. Right after you save the profile, RPP displays the maximum and average deltaE errors (the errors that exist between the profile-corrected color values from your target image and the 'true' color values given by the `.cie` target-template). Smaller is better. For a CC24-like target, a maximum less than 7 and an average less than 4 is good, but profiles with much larger values may do quite well. Profiles based on other targets, like the ColorChecker SG, will likely have larger values.

## Lighting and Capturing the Target

by Iliah Borg

Properly capturing an evenly illuminated target is the most important aspect of camera profiling. Without a quality shot of the target, the profiles will be poor - GIGO. The quality of the shot is more important than having an expensive profiling target. The classic CC24, or ColorChecker Passport, or even a Mini CC is all that is needed to start.

If you have a studio, you can use Solux 4700K lamps with black-painted backs or HMI lights (Mole-Richardson is a good source). Broad-spectrum fluorescent lamps (Normlicht or JTI branded) are also a solid choice. If you are on a budget, any halogen lamps with a stabilized power supply and gelled to reach about 5000K are OK.

For a decent setup, check <http://www.imatest.com/docs/lab.html#lighting>

You can also use daylight if a studio is out of reach. It is interesting to make different profiles for different types of the daylight, and with different positions of the Sun.

1. To start, use as simple a lens as possible; a 50mm prime is ideal. You will need a separate profile for your polarizing filter and also for CC40m and CC30m filters. Some lenses need a different profile, especially old manual-focus primes. A good deep hood is a must; any reflections or flare will result in a poor profile. Clean the sensor, the lens, the hood, and, of course, the filters if you are going to use them.
2. Affix the target on a gray card 2-3" larger than the target in each dimension. If the target is not perfectly flat, the resulting profile will be compromised with shadows, colour casts, and uneven reflection. This is very important for smaller targets like the Mini ColorChecker.
3. Do not fill the frame with the target. The target should occupy the middle 1/3 of the frame in each dimension.
4. Cover the target with another gray card and set white balance from it. Remove the covering gray card and blow away any dust from the profiling target.
5. Shoot at  $f/5.6$  or thereabouts, very slightly out of focus.
6. Take a shot and ensure that readings from the gray card close to the four corners of the target are closely clustered within a 6-point range. Be sure to cover the viewfinder to prevent the introduction of stray light.
7. Expose so that the whitest patch is in the range of 248-252 (250 is ideal). Take several shots bracketing with shutter speed to ensure good results.

## Feedback and Support

To file a bug report please use the support forum below. In almost all cases I will need the information necessary to reproduce the problem. Typically that will include the troublesome Raw file. Please upload it to the group file repository or send it to me in some other way.

Menu **Help** has item **Create Diagnostic Archive on Desktop** - please include this archive in your email to me. It can help me a lot to figure out the problem, however don't upload it to any forums or make available to anyone except me.

My email: [at@tigry.net](mailto:at@tigry.net)

Support group (forum): <http://groups.google.com/group/raw-photo-processor>

## FAQ

*No real time preview! Do I really have to press Apply button all the time to see changes?*

Yes. I'd recommend using the ⌘R shortcut instead.

RPP uses slow and precise 32-bit floating point calculations to provide the best conversion results and this kind of processing speed doesn't go along with any kind of real-time previews. Most of other converters use integer math, which is a lot faster, but it is very rough and inconsistent. It creates a lot of artifacts, noise, decreases dynamic range, resolution, causes posterization, and spoils colors. To cover up all those issues, vendors have to introduce various smoothing and noise filtering techniques, which degrade images even farther. Just do a simple comparison - the difference is easy to see on a sharp shot. Since good math requires a lot of power, RPP can use all available CPUs on your system. By default it will use 2 cores and usually this is enough. Most modern Macs have only 2 cores. With the Mac Pro and some iMacs, RPP can use all available cores (4, 8 or more), but this feature available only to donators.

*First Apply, than no sliders! What's going on?!*

Sliders don't work in RPP context. Keyboard control is highly recommended - just click into a field you want to adjust or use ⌘ shortcuts for direct access and use Up or Down arrow keys on your keyboard to spin value up or down in small increments. For large increments hold ^ key. Fixed increments in all fields are individually adjusted, but if you find some too big please let me know.

Regarding sliders - had them and after all years I can tell for sure that they are very close to be completely useless. The nature of the control is such that it puts a lot of strain on hand, wrist and arm since it has to be grabbed and precisely moved with mouse. They also imprecise and take a lot of screen space.

*Why are images converted by RPP are so much smaller than in other converters?*

Because RPP has two conversion modes - "half" and "interpolated" and "half" is the default one. You can redefine this through Camera Defaults.

Half-mode is very fast and good enough for web, small prints, or previews. If you want full resolution output, enable VCDMF or AHDMF interpolation at the bottom of the control panel. VCDMF is recommended.

*Why do my Raw files look underexposed (dark, gray veiled) in RPP compared to other converters?*

Because they really are underexposed. By default RPP shows images as they captured by your camera in Raw with only essential tonal range adjustments. They may therefore look darker than you expect. Usually this happens because your camera's light meter is calibrated to some low gray point value by the camera vendor. Most (if not all) modern DSLR cameras do this to preserve more highlights, and most other converters quietly apply compensation to your image to correct that. There are two ways to resolve this - apply exposure correction in RPP or adjust the camera's light meter. For exposure correction try value 0.7 in Compressed Exposure field (the big one, at the right side). Usually this is enough, but some cameras may require differing amounts. This way RPP will behave the same way as other converters, except that you'll be aware of the change and can fully control it. You may also use the same value with the regular Exposure field but then your highlights may get abruptly clipped. Compressed Exposure, by contrast, will gently roll off your highlights and preserve more details, as with film. Adjusting your camera's meter is a more complex procedure and I'd recommend this option only for advanced users who understand how metering

works and all possible implications. You'll have to check if your camera has an option to apply a metering bias. This option is named differently for different cameras, and you may need to dig through your camera manual.

*How should I choose the correct value for exposure correction though?*

The answer below is equally applicable to both compressed and regular exposure corrections, but I always recommend using Compressed Exposure field (the big one, at the right) for this kind of adjustment.

We are going to follow photographic theory and Adams' Zone System. Look at the Histogram in RPP: you can see L\* values at the thin top striped bar and black/gray stripes in the background with numbers from 0 to VII. They represent Adams' Zones. Let's say we have a light skinned human face in the picture and you want it to be your main subject. Usually it expected to be in the right half of Zone V and we'll try to make it so.

1. On the Histogram disable the R,G,B channels and enable the L channel for now.
2. Hold ^ button and, using the mouse, select a rectangular area in the picture covering only skin (no eyes) including its dark and light areas (approximately of course).
3. Look at the Histogram - you should see a gray vertical line showing averaged L\* value of the selected area and you can see the exact value below in the info box. This line should be within the right half of Zone V or have an L\* value between 50 and 58. If it's not, apply exposure correction. Look at the top part of the Histogram - you should see negative and positive orange numbers near every zone border. They represent the approximate amount of correction necessary to move current the L\* value to the beginning of that zone. Let's say you see that value for Zone V shows +1.1. Now just click it and RPP will automatically add 1.1 to the current value of the Compressed Exposure field. If you hold ⬆ while clicking, it will add this amount plus half zone width more; i.e., it will place your gray line exactly in the middle of that zone.
4. Now your L\* value should be within Zone V and you may try some additional tweaking to make the face a little brighter or darker.

*I've applied Compressed Exposure correction and it helped, but my images still lack the "punch" I'm used to with other converters. Why?*

Because RPP doesn't do any automatic corrections. If you want more contrast use the Black Point field; try 0.1-0.3. The Contrast control is another way to do this. Try 4 and see if you want more or less.

*What's your workflow?*

My workflow is kind of film-inspired. Develop in bulk blindly, trash goners and work with keepers.

In short:

After copying Raw files to computer I process them in batch mode in RPP to produce half-sized jpegs. It takes from 1 to 10 seconds per file on an Intel Mac depending on your Raw size and computer power.

Usually I set white balance for the batch to Daylight because at this stage I don't really care about light or white balance, and Daylight works okay for most kinds of light. You may use 'As shot' instead.

Each jpeg is saved by RPP to the same directory containing the original Raw file: same name, different extension.

Then I open all those jpegs in Mac OS X Preview (10.6 only -- in 10.5 it's unusable and you'll need another fast viewer, such as ViewIt). I go through them a couple of times to remove all bad shots (⌘Del). I look only at technical quality and ignore color. There is a shortcut in RPP to open all files from the last batch in a selected application: ⌘U.

After that I send all Raw files that don't have a corresponding jpeg to the trash, but, as a safety measure, I don't empty the trash yet.

Now we have only keepers. I rename the directory with the keepers to something meaningful. It is important to do all renaming before you start working with keepers.

Open the first keeper, adjust white balance, exposure and so on, change output format to Lab tiff, VCDMF, and save these setting to History (⌘I or '+' button). Now go to the History Window and you'll see the inserted record as the selected one. Click Propagate, switch dialog to icon view and select all Raw files which look approximately similar to the open one, click Ok. RPP will assign the selected settings to all those files. You may select any files there - RPP will automatically skip all non-Raws. Now repeat the pattern with next unprocessed file (a file without specific setting) until you have all files in the directory complete.

Now just run batch on all those files, and it will produce final full-resolution images automatically.

Batch mode in RPP can work across directories (i.e., you may separate files in different directories and select those directories in the Open dialog).

*What options do I have to control B&W conversions?*

In monochrome simulation mode you can use the R,G,B fields to control channel mixing. Try the Tungsten white balance preset vs. Daylight to see what I'm talking about. Simply moving the R and/or B values will produce different tonalities in your B&W image and you may even preserve some settings the same way as color balance presets (Settings/Create WB Preset). Saturation also has significant effect.

*I'm seeing halos and noise when post-processing files converted by RPP in Photoshop.*

If you intend to post-process files after RPP (which is recommended by the way) you need to disable sharpness in RPP (put 0 there) and minimize Local Contrast (0 to 5).

# Changelog

## New features and bug fixes in 4.7.1:

- Added support for Nikon D3200, D7100, P7700; Sony RX1; Fuji X-E1, X-S1, X100S, X20; Panasonic LX7, FZ200, LF1; Pentax K-5 II; Canon 6D, 1D C, S100; Olympus XZ-2, XZ-10; Samsung NX300
- Bugfixes

## New features and bug fixes in 4.7.0:

- New TrueFilm profiles: KL25, TP25, K64 PW, V50v2, TC4v2, LFv2
- New TruePaper profiles: GF Lith Selenium Gold, GF Lith Selenium, GF Lith Silver
- Mac OS X 10.8 Mountain Lion compatibility
- Added support for Canon 1D X, all new Sony SLT and NEX cameras
- Added white balance presets for Nikon D4, D800, D800E
- UI adjustments
- Added colorimetric mode (enabled in the curve selector)
- Fixed many bugs, added new ones.

## New features and bug fixes in 4.6.0:

- Added support for Sony RX100, A37, NEX-F3; Fuji X-Pro1; Samsung NX200; Nikon D800E, P7100; Leica M Monochrome;
- Added support for lossless DNG compression (LR4 uses it now).
- New profiles for Panasonic G2, G3, GH1, GH2, GX1, GF1,GF2,GF3, GF5, LX5; Pentax K-x, K-5, K-r, K-7; Samsung NX\*; Nikon D300S, D7000, D5100, D3200, D3100, J1, V1, D800, D4; Canon 5DMkIII; Sony NEX\*, SLT\*; Leica M9;
- Added new batch mode, button Run Batch in History window (see chapter Batch Processing Mode).
- Added Settings Selector to menu Settings (see chapter Workflow Helpers).
- Double click in preview window alternates zoom-to-fit on and off.

- New Diagnostic item in the Help menu. Use it to substantiate your emails with any complains.
- Fixed many bugs, added new ones.

#### New features and bug fixes in 4.5.0:

- Added support for Nikon D4, D800; Olympus E-M5, E-PL3, E-PM1; Panasonic GX1; Canon G1X, 5DmkIII;
- Relocated and regrouped most of menu items to menus Controls and Settings.
- Added new mechanism for multiframe settings export and import (see chapter Workflow Helpers).
- Added support for 8/16-bit sRGB TIFF output.
- Double click on image now disables "Zoom to fit" and positions clicked part in the center of the window.
- Better UI handling of low resolution images.
- Added support for HD 709 output with studio swing.
- Added Deselect item to the Controls menu.
- Bugfixes

#### New features and bug fixes in 4.4.2:

- Added initial support for Fuji X10;
- Added generic profile for Ricoh cameras.
- New profile for Kodak SLR and Nikon D5100.
- New setting in Window menu to disable scrolling values in fields with mouse.
- Many bugfixes and small UI improvements.

#### New features and bug fixes in 4.4.1:

- Added support for Sony 5N, A77V, NEX-7; Nikon 1;
- New profile for Canon 30D;

- Mouse scroll wheel or trackpad gesture can be used to control numeric field values same way as with keyboard Up or Down. Can be disabled (menu Window).
- Bugfixes, including proper Auto WB in batch mode with interpolation.

#### New features and bug fixes in 4.4.0:

- New UI. Fully rearranged, compact and no more sliders - only text fields. Use Up/Down or Ctrl-Up/Down keys inside of text field in addition to direct numerical entry.
- Added Presets - you can quickly save and restore settings from new Pop-Up button.
- Removed workaround for OS X 10.6.7 and it's broken support for ICCv4 profiles. Use OS X 10.6.6 or 10.6.8 or any other versions.
- New profile for Fuji S100FS, Leica D-LUX 5 and Canon 5D Mk II
- Directory default now preserves state of WB selector, Auto and As Shot saved as such, Custom is fixed balance.  
Ctrl-Click for D button will save default with fixed WB.  
Opt-Click for D button will create Camera default.
- Improved Show Previous to preserve Info values and current selection frame
- Export/Copy settings in new simpler plain text format. Old XML format is still supported.
- Lots of bugfixes and workarounds for OS X 10.7.0 Lion bugs.

#### Bug fixes in 4.3.1:

- This release resolves few issues introduced by 4.3.0 for 32 and 64-bit versions.

#### New features and bug fixes in 4.3.0:

- Released 64-bit version of RPP for Mac OS X 10.6 and newer. It's faster and can handle bigger Raw files. Can be downloaded at [raw-photo-processor.com](http://raw-photo-processor.com). 32-bit Universal Intel/PPC version is still supported and both versions will be released together as separate packages.
- Added support for Olympus E-P3; Canon T3/1100D
- Copy Tags option should copy IPTC info from sidecar XMP files now
- Bugfixes

## New features and bug fixes in 4.2.3:

- Added support for Canon 600D/T3i, Nikon D5100
- Added preliminary support for Samsung NX11 and NX100; Fuji HS20EXR and F550EXR; Leaf AFi-II 12
- New profiles for Leica M9, R8, R9 and X1; Olympus XZ-1
- Bugfixes

## New features and bug fixes in 4.2.2:

- Worked around Mac OS 10.6.7 bug causing wrong colors in some preview modes
- Resolved issue with undesirable highlights clipping caused by some camera profiles
- New color profile for Fuji S5 Pro
- Bugfixes

## New features and bug fixes in 4.2.1:

- Added initial support for Fuji X100 and Olympus E-PL2
- Added new TrueFilm profiles - LF, TC4; updated K64 and V50
- Replaced Red-O-Green profile with Duo profile
- Bugfixes

## New features and bug fixes in 4.2.0:

- Added support for Olympus E-5 and Panasonic GH2
- Interface adjustments
- Bugfixes

## New features and bug fixes in 4.1.9:

- Added support for Nikon D7000, D3100; Pentax K-r, K-5; Canon 60D; Sony A290, A390
- Added preliminary support for Panasonic GH2
- Bugfixes

## New features and bug fixes in 4.1.8:

- Added preliminary support for Nikon D7000 and P7000; Canon 60D; Samsung TL350/WB2000
- Added support for Panasonic LX5; Sony A560 and A580; Canon G12 and S95
- Bugfixes

## New features and bug fixes in 4.1.7:

- Added support for Sony SLT-A55V and SLT-A33
- Added L\* tone curve as an alternative to Film-like and Gamma
- Bugfixes

## New features and bug fixes in 4.1.6:

- Added new TrueFilm profile P160NC
- Bugfixes

## New features and bug fixes in 4.1.5:

- Changed profiles for many Nikon DSLRs (D60, D90, D2X, D300S and others)
- Added preliminary support for Samsung EX1/TL500
- Improved precision of Gamut View and added support for CMYK profiles
- Improved blending for Fuji S3/S5

- Bugfixes

New features and bug fixes in 4.1.4:

- Improved precision in Color Management.
- Added support for Sony A450, NEX-3, NEX5; Hasselblad H4D; Olympus E-PL1.
- New profiles for Sony A900 and A850.
- Proper file extensions will be enforced on write.
- Bugfixes.

New features and bug fixes in 4.1.3:

- Added many simulation profiles for different kinds of real color and B&W films (selector under the **History** button). See the *Simulation mode* chapter.
- CIE Lab 16-bit output TIFF format now can be used in all color managed modes.
- Added support for Panasonic G2, Samsung NX10, Canon 550D/T2i, Canon S90.
- Updated built-in profiles for Nikon D200 and Pentax K-x.
- Added support for 1:1 format in Panasonic DMC-LX3.
- Improved precision for 32-bit BetaRGB TIFF format.
- Bugfixes.

New features and bug fixes in 4.1.2:

- Added Rotate Left and Rotate Right items to the Edit menu and corresponding drop-down menu to the History window. See the *History and Settings Management* chapter.
- Changed handling of overexposed channels. Now it's possible to clip all channels evenly and prevent pink and other mis-colorations in overexposed areas. See *Exposure* and *Compressed Exposure* chapters.
- Added Destination field to the History window to simplify changing of destination in selected records.

- Disabled click-through for most parts of interface to prevent accidental changes when RPP windows are inactive. Now most of controls are active only when their window is active (frontmost).
- Added support for square format in Panasonic DMC-GF1.
- Bugfixes.

#### New features and bug fixes in 4.1.1:

- Improved Camera Profiler tool. See "Camera Profiler" chapter.
- Added Open current profile and Move current profile to Trash items to the File menu.
- Added built-in profile for Leica S2.
- Fully reedited manual. It is a PDF document now.
- Bugfixes.

#### New features and bug fixes in 4.1.0:

- Added camera profiler for donators - you can create custom profiles for your cameras and lenses now. See chapter "Camera Profiling".
- Improved preview color accuracy.
- Bugfixes.

#### New features and bug fixes in 4.0.3:

- Zone correction numbers on the histogram are clickable now to apply the value automatically to Compressed Exposure. See FAQ question "How should I choose correct value for exposure correction".
- Compressed Exposure correction now can be used for negative corrections.
- New ISO-specific profiles for Canon 5DMkII; Sony A900, A850; Nikon D300, D3, D700, D3X; Canon G11
- New profiles for all Sony Alpha; Nikon D200, D90; Kodak SLR/c and SLR/n; most of Canon PowerShot; All Panasonic cameras except 4/3 models.
- Removed Raw-tick from the UI and added two untagged RGB formats to Save Format instead

- Added File->Refresh Profiles option to quickly refresh Profiles menu

#### New features and bug fixes in 4.0.2:

- Added support for Pentax K-x and K-7; Nikon D3S; Sony A550
- New, ISO specific color profiles for Canon 7D, 5D MkII, Nikon D3S
- New color profiles for most of 4/3 and m4/3 Olympus cameras; Panasonic G1, GH1, GF1; Sony A850, A900; All Pentax cameras.
- Added preliminary support for Canon 1D MkIV
- Added FAQ to this document and to the website
- Bugfixes

#### New features and bug fixes in 4.0.1:

- Added support for Olympus E-P2
- Added environment variables for 'Open in ...' applications, mostly for shell scripts. See chapter Integration in the manual.
- Bugfixes.

#### New features and bug fixes in 4.0.0:

- Destination field in the History can have directories relative to Raw file directory location. See History chapter in the Manual.
- Added Clear button to the History window for Destination to clear Destination of selected records. See History chapter in the Manual.
- Search field in the History can be used to filter by Destination.
- Most of write errors now will be reported before conversion starts.
- ⌘U (Open last batch results) will work even if some files from that batch are not there anymore.
- Bugfixes

## New features and bug fixes in 3.9.9:

- Added support for Canon S90.
- Black point in output files should always be 0 now (before it could be higher for some cameras). This change affects all cameras, so please report if you see unexpected clipping in shadows or highlights.
- Bugfix in preview for monochrome modes.

## New features and bug fixes in 3.9.8:

- Added support for Canon 7D, G11; Leica M9; Nikon D300S, D3000; Panasonic FZ35, FZ38, GF1
- Preliminary support for Sony A850
- New improved profile for Nikon D300

## New features and bug fixes in 3.9.7:

- Support for Olympus E-P1.
- Entirely new and more accurate profiles for Nikon D3, D700 and D3X.
- Bugfixes.

## New features and bug fixes in 3.9.6:

- Support for Panasonic GH1.
- Entirely new and more accurate profiles for cameras:  
Canon 450D, 500D, 1000D;  
Mamiya ZD.
- Few bugfixes.

## New features and bug fixes in 3.9.5:

- Entirely new and more accurate profiles for cameras:  
Canon 5D MkII, 1Ds MkIII, 50D;

Sony A900, A700, A350, A300, A200, A100;

Olympus E410, E420, E510, E520, E620, E3, E30;

Kodak SLR/c, SLR/n, 14NX, 14N, ProBack;

All Panasonic cameras (G1, LX3 and older);

All Pentax and Samsung cameras;

Please provide your feedback - we really want to know how those profiles work for you. Profiles for all other cameras will also be updated in future releases.

- Added support for Canon 500D(T1i, KISS X), SX1 IS and Kodak Z1015 IS.
- Added support for perceptual BetaRGB L\* output profile.
- Bugfixes.

#### New features and bug fixes in 3.9.4:

- Fully reworked black point adjustment. It's implemented with film-like roll-off. See 'Black Point' chapter in the manual.
- Corrected apparent underexposure for 12-bit Nikon D3 NEFs.
- Bugfixes

#### New features and bug fixes in 3.9.3:

- Corrected LightRoom plugin to support DNG files. There are also other improvements.
- Added dedicated File menu item to define global default settings for a camera.
- Improved jpeg support - better compression quality, original capture timestamp is always saved in EXIF and added 70% compression level.
- Changed 'Copy Tags' option behaviour to avoid problems with Adobe Camera Raw when it intercepts saved files meant for opening in Photoshop. This applies to Phase One Raw-TIF and all Raws in DNG format. Please report if you still have problems like that, i.e. when saved from RPP files open in ACR instead of Photoshop. See 'Copy Tags' chapter in the manual.
- Bugfixes.

#### New features and bug fixes in 3.9.2:

- Added support for Olympus E-620.

- Added hand-dragging tool - drag mouse with  $\hat{u}$  pressed to pan image in window.
- Numbers in input fields now can be stepped up or down from keyboard with Up or Down arrow keys.  $\hat{u}$ -Up/ $\hat{d}$ -Down will change them in x10 bigger steps.
- Multiple UI corrections and new keyboard shortcuts for input fields, external application selector and other controls. See tooltips and menu Edit.
- Support for Canon 5D Mark II firmware 1.0.7 (sRAW files).
- Improved dot-noise remover.
- Always write tag for original raw capture date and time to tiff files.
- Bugfixes

#### New features and bug fixes in 3.9.1:

- Added export plugin for Lightroom 2 for donators (installed from Raw Photo Processor menu). See chapter "Integration" in the manual.
- Added menu for donators to open at once all files saved from last batch in selected application. See chapter "Integration" in the manual.
- Now it's possible to quickly choose between many applications to open saved file in.
- Bugfixes

#### New features and bug fixes in 3.9.0:

- Added correction for vertical banding in extreme highlights on Nikon D3.
- New set of menu items for settings export, import, copy and paste for donators. See "Workflow Helpers" chapter.
- Big changes in History and Settings management (listed below). Some changes are not entirely compatible with previous versions, so please read "History/Settings management" chapter carefully.
- Added control to assign Auto, As Shot or Custom white balance option to selected records in History.
- Changed meaning of Directory Default in History - now it applies only to files without existing records in History.
- Added Propagate button to History window to propagate selected settings across multiple files at once.

- Added Clean button to History window to automatically delete records for non-existing files in selected directories.
- Added coloring and changed default records filter in History window .
- Added UniWB preset.
- Bugfixes.

#### New features and bug fixes in 3.8.6:

- Added dot-noise remover for hot pixels and similar kinds of noise. See "Remove dot-noise option" chapter in the manual.
- Added white balance presets for Nikon D3X, D3, D700, D2X, D2Xs, D300, D90; Fujifilm S5 Pro; Panasonic L1, LX1, LX2, LX3, FZ8, FZ18, FZ30, FZ50.
- Improved batch mode:
  - Support for directories scanning at full depth.
  - Quit/Crash protection, i.e. if RPP quit or crashed it can be restarted from last position.
  - Batch cancel button.
 See "Batch Processing mode" in the manual for more details.
- Added option to File menu to prevent overwriting of existing files. Instead RPP will try to automatically add sequential unique numeric suffix to the file name in range from 001 to 999.
- Initial support for Hasselblad V96C FFF files.
- Bugfixes.

#### New features and bug fixes in 3.8.5:

- Added support for Sony DSLRs white balance presets in A200 and above.
- Fixed problem with 'As Shot' white balance for ARW files saved from Sony IDC .
- Added option 'Optimize for post-processing' to File menu. It compresses image on Save to leave some space in shadows and highlights for processing with external tools. This is an advanced option - image will look more dull and colorless after save. Don't use if don't understand it. See 'Optimize for post-processing option' chapter in the manual.
- Bugfixes.

## New features and bug fixes in 3.8.4:

- Improved methods for Sharpness and Local Contrast. Should be less susceptible to halos and provide better details. Readjustments may be required for these settings made in older version.
- Better support for Hasselblad H3D .FFF files.
- Bugfixes (color fringing in Half mode).

## New features and bug fixes in 3.8.3:

- New interpolation method - VCDMF based on "Variance of Color Differences" algorithm. It has better resolution, more naturally looking noise rendering, less artifacts and it's a lot faster than AHD MF. This is the recommended method now. Please tell me about your impressions and report any issues if any!
- Bugfixes in Canon sRAW support and "Copy Tags".
- Changed label for AHD method to AHD MF so it's not confused with original AHD algorithm.
- VNG is obsolete now. It's still available from history for past conversions, but removed from primary control panel.

## New features and bug fixes in 3.8.2:

- All new color profiles for all Panasonic, small Leica and Olympus E510,E520 cameras.
- Full support for Panasonic DMC-G1.
- Full support for Canon 50D and 5D Mark II.
- New File menu item "Set selected settings from History" for quick restore of current setting to known state. See chapter "History/Settings Management" in the manual.
- Bugfixes.

## New features and bug fixes in 3.8.1:

- Major change in colors rendition - should be more neutral and accurate. Affects all cameras.
- Added new ability to quickly switch between current and previous image variants for donators. See "Workflow helpers" section in the manual.

- Added option to disable automatic Apply (menu File) in all controls except button Apply and it's shortcut.
- Initial support for Canon 5D Mark II.
- Panasonic FX-150 support.
- Rolled back cold-warm to previous implementation (as in 3.7.9 and before).
- Bugfixes.

#### New features and bug fixes in 3.8.0:

- Added support for Canon G10.
- Cold-Warm control uses different method now, close to the effect of true filtering in front of the lens - should be more natural, but numbers will be different compared to previous implementation.
- "Open Recent" in menu File now works.
- Added some controls with shortcuts for donators to simplify workflow (see "Unlock code" and "Workflow helpers" section in the manual):
  - Button Next to open next Raw file in current directory.
  - Items to open next or previous Raw file in current directory in menu File.
  - Item "Move current file to Trash" with regular shortcut ⌘Del in menu File.
  - Option "Automatically open next Raw file after Save" in menu File.
  - Option "Maximize window for opened files" in menu Window.
- A lot of bugfixes (memory leaks, batch and others).

#### New features and bug fixes in 3.7.9:

- More performance improvements - faster saving for all multi CPU systems.
- Special support for systems with more than 2 CPUs (this means Mac Pro or Power Mac G5 Quad) for donators. Very significant performance improvements in preview generation and saving from 2 to 6 times depending on hardware. RPP will use all available CPUs simultaneously for all processing operations. This feature is available only to past and future donators through personal unlock code. See "Multi CPU processing" section in the manual.
- Bugfixes.

## New features and bug fixes in 3.7.8:

- Performance improvements. Preview and saving should be faster now (1.3-2 times), especially for Intel and other dual CPU Macs.
- Full support for Sony A900 and improved profiles for all other Sony DSLRs.
- Improved conversion accuracy for Phase One.
- Preliminary support for Canon 50D.
- Bugfixes (highlights recovery and others).

## New features and bug fixes in 3.7.7:

- Phase One backs are fully supported now with custom profiles for P20, P20+, P21, P21+, P25, P25+, P30, P30+, P45, P45+. Support includes alternative profiles for incandescent light (available via Profiles menu when Raw is loaded).
- Added support for Panasonic LX3 and also changed profile for all Panasonic cameras - should be more neutral now and far less noisy.
- Added support for Nikon D90 and improved D700.
- Bugfixes.

## New features and bug fixes in 3.7.6:

- Added "Compressed Exposure" (CEv) control to avoid highlights clipping during exposure adjustments - they are getting compressed within specified range instead. See "Compressed Exposure Correction" chapter.
- Bugfixes.

## New features and bug fixes in 3.7.5:

- Fully reworked Highlights Recovery tool. Added "Guess Tone" feature to restore not only gray, by any single toned areas. See chapter "Highlights Recovery" and [Examples](#).
- Improved Raw mode. See chapter "Raw Mode".
- Added support for Olympus E-520.

- Enabled “Check for Updates” feature and added menu item to enable/disable automatic update checking.
- Bugfixes.

#### New features and bug fixes in 3.7.4:

- Added support for user defined white balance presets. See the White Balance Presets chapter.
- Added support for white balance presets defined in Raw files by some vendors (Canon, Pentax, Olympus). See the White Balance Presets chapter.
- Improved histogram view. Added middle tone marker to it's EV scale (12.7%). See the Histogram chapter for more details.
- Bugfixes.

#### New features and bug fixes in 3.7.3:

- Added EV, L\* (from Lab) and Adams Zone system scales to the histogram view. See Histogram chapter for details.
- Many bugfixes and adjustments.

#### New features and bug fixes in 3.7.2:

- Added Sony A200, A300, A350, Canon 450D and Olympus E-420 support.
- Adjusted sharpness algorithm to be less aggressive in shadows and highlights.
- Bugfixes.

#### New features and bug fixes in 3.7.1:

- Changed the default way RPP handles exposure and added Auto Exposure button. See Exposure section in the manual.
- Added sharpness slider. See Sharpness section in the manual.
- Internal readjustments and bugfixes.

## New features and bug fixes in 3.7.0:

- Added gamut viewer for current image and specified color spaces. Use it to check if your processed image fits into final output device gamut like printer or monitor. See the documentation for more details (chapter Gamut View below).
- All new color profile for Sony A700 DSLR.
- Adjusted internal defaults for many camera profiles.
- Improved "Copy tags" option - now it creates EXIF tags for shutter speed, aperture, ISO, lens and original time stamp. Also it copies entire Maker Notes section from Raw files - some applications can recognize it and show a lot of internal details (exiftool f.e.) Also a lot of data stored as XMP block in the same file.
- Fixed few bugs in batch mode.
- Refreshed UI.

## New features and bug fixes in 3.6.8:

- Fix for (firmware?) bug associated with Nikon D3 high ISO lossy decoder. It's rare, but causes very bad decoding artifacts. Please let me know how it works for you.
- New application icon.

## New features and bug fixes in 3.6.7:

- All new Fuji S3 and S5 S/R pixels recombination (please report any issues!).
- Added support for Epson R-D1, Kodak 760C DSLR and all Kodak ProBack MF backs.
- New profiles for all Fuji, Minolta, Pentax, Olympus, Leica, Sony and Samsung DSLRs.
- New profiles for all Canon, Olympus and Sony P&S cameras (they are all supported).
- New monochrome mode - lightness only channel as in CIE Lab.
- Bugfixes and small UI changes.

## New features and bug fixes in 3.6.6:

- Added support for BetaRGB-Lstar, ECI-RGBv2 and perceptual sRGB output profiles. First two profiles use Lstar curve instead of regular gamma curve and this has it's advantages. Check here for more details: [http://www.eci.org/eci/en/044\\_working\\_colour\\_spaces.php](http://www.eci.org/eci/en/044_working_colour_spaces.php)
- Massive review of built-in profiles. All Canon, Nikon and Kodak SLR/c, SLR/n, 14NX and 14n DSLRs are updated. Please report any issues. These profiles are more accurate and produce less noise, so you should see improvements. You may need to readjust settings for some images though. More updates coming with next releases.
- Bugfixes.

#### Bug fixes in 3.6.5:

- A fix for Hasselblads "colored stripes bug". No other changes.

#### New features and bug fixes in 3.6.4:

- Support for Olympus E-3.
- Added selectable histograms for R,G,B and L (from Lab) channels. Current picker values also shown on the histogram.
- Added selection ability and support for some operations over selection. Plain selection updates histogram, selection with ⌘ pressed calculates white balance over selected area, selection with ^ pressed calculates picker values over selected area.
- Bugfixes.
- 

#### New features and bug fixes in 3.6.3:

- Mac OS 10.5 optimizations - older versions are slow on Leopard, use this one instead.
- Some adjustments for Kodak DCS Pro SLR/c, SLR/n, 14NX, 14N.
- Support for Nikons D300 and D3, Sony A700 and Canon G9.
- Support for Canon sRAW format.
- Bugfixes.

## New features and bug fixes in 3.6.2:

- Shadow noise prevention - you should see a lot less of it now and the change affects all cameras! By "prevention" I mean special approach in processing to minimize artificial noise creation and camera noise amplification. RPP still doesn't use any noise filtering techniques. Please report any oddities!
- Fully reworked Kodak DCS Pro SLR/c, SLR/n, 14NX, 14N and Fuji S5 cameras support.
- Kodak DCS Pro SLR/c, SLR/n, 14NX, 14N have alternative profiles added for different kinds of light (check Profiles menu).
- Added color info picker (^-Click for sample 3x3 or ^-Opt-Click for sample 7x7). It reports RGB and Lab values with corresponding densities.
- Added "Check for Updates" submenu (in menu Help). This is an experimental feature and may not work right now, but may start working at some moment.
- Bugfixes

## New features and bug fixes in 3.6.1:

- Batch conversion. Think of it as of a robot pressing Open button, loading image and pressing Save button. The History feature plays major role in settings assignment. Choose multiple files in Open dialog or drop few files to RPP while holding ^ and ⇧.
- Added support for DSLRs Canon 40D and Canon 1Ds Mark III, Hasselblad digital backs.
- Added support for dual monitor configurations.
- Added Black Point slider.
- Bugfixes.

## New features and bug fixes in 3.6.0:

- Halved memory footprint.
- Added generic support for MF digital backs. Now RPP should be able to process 33MP files on systems with 1.2Gb and for smaller files 1Gb is always enough.
- Added custom profiles for Leaf and Mamiya MF backs.
- Fixed saturation in profiles for Kodak 14N, 14NX, SLR/n, SLR/c. Support for these cameras is still in work and will be improved farther.

- Added 'Reset to Defaults' - click Apply while holding Opt key.
- New feature - alternative profiles. Some cameras may benefit from different profiles built for different conditions. F.e. now I've included profile for Leica M8 with Hot Mirror filter attached. When you load an image from camera RPP has alternative profiles for there will be menu Profiles on the top and you can pick one there.
- More controls causing automatic apply now when you click them (highlights recovery f.e.)
- Removed Uplab/Lab switch - it's redundant and there is no need for it any more.

#### New features and bug fixes in 3.5.9:

- We've moved! Now RPP has it's own domain: <http://www.raw-photo-processor.com/> . Also I've redesigned the site and added new content there.
- Added auto white balance preset.
- Added slider to adjust tone on cold - warm scale. Very useful for quick corrections of white balance presets when you want to make them a little warmer or colder. The closest analog for this slider is traditional "color temperature" adjustment so popular among photo processing applications.
- Improved auto alignment for second green channel relative to first green channel. This mode now enables by default in most cases (tick near second green slider in unmarked state) and you should always use it unless you really know what you are doing. It significantly decreases artificial noise in images and makes them more smooth without affecting details.
- Added custom profiles for some Kodak DSLRs - SLR/n, SLR/c, 14NX, 14N and all Samsung DSLRs.
- Added custom profiles for Nikon, Panasonic, Samsung and Fuji digicams.
- Changed History database format to support new options. The new format is not compatible with old one. When you start RPP 3.5.9 for the first time it will convert your old database to new format and archive the old one. This means if you launch RPP version 3.5.8 or below the history will be empty. It's not lost though and if you want to return to state before RPP 3.5.9 send me a note and I'll explain how to do this.

#### New features and bug fixes in 3.5.8:

- New feature - monochrome mode. This includes Photobrom Black, Bromportret Sepia, Iodocont Green, Iodocont Blue and experimental Red-O-Green profiles. All made by Iliah Borg as always. All of them measured from real photo papers. In this mode channel balance sliders act like a channel mixer, so you may adjust influence of each channel on overall tonality individually.

- Added custom profile for Olympus E410.
- Help menu - provide feedback and copy crash log to clipboard (so you can paste to email for me). Also it gives easy access to RPP's document file.
- Copy Tags option state is preserved between restarts and also now it copies embedded to Raw IPTC info (if you have any).
- Fixed 'red dots' issue AKA weird colors in clipped highlights or shadows.
- Other fixes and UI tweaks. F.e. Local Contrast may be disabled now without losing its value and you may quickly check its effect on an image.

#### New features and bug fixes in 3.5.7:

- Built-in profiles for Olympus cameras - E1, E10, E20, E300, E330, E400, E500. E410 works, but it's in preliminary stage for now - no its own profile yet! Also some Oly P&S cameras have built-in profiles.
- Performance improvements - about 20% for preview recalculations.
- Added generic support for custom ICC profiles - now you may assign your own input profiles to Raw files. To use it you need to copy some profiles to directory \$(HOME)/Library/Application Support/RPP/Profiles. If there is at least one file with extension .icc or .icm in this directory RPP will create menu 'Profiles' in the menu bar and there you can switch between profiles or return to built-in profile by clicking Default.
- "Open in Photoshop" options is replaced with more generic approach - you can pick any application to open your images after saving. To set it up use Edit->Set External Editor menu. Hint: You may specify Preview there and check your files right after conversion.
- Added support for Undo/Redo.
- Added support for sRGB when saving jpeg files - check that format selector near Save button.
- Added a warning when PowerPC version is launched on Intel Macs - native Intel version should be used instead.
- Bug fixes!

#### New features and bug fixes in 3.5.6:

- Big news - added custom profile for the latest and greatest Canon shooting machine 1D Mark III!

- More profiles - Minolta DSLRs 5D and 7D, Pentax DSLRs \*istD, \*istDL, \*istDL2, \*istDS, \*istDS2, K10D, K100D, K110D, Leica DMR, M8, Digilux3, Sony A100 and R1. Plus some P&S cameras. I don't have any of those cameras, please provide your feedback!
- Added new control - Local Contrast. This is a very powerful tool to increase contrast of your images. Just try and you should like it!
- Fixed few bugs, of course.

#### New features and bug fixes in 3.5.5:

- Added custom profiles for Fuji S2 and S3, Canon's P&S G2, G3, G5, G6, Pro1 (I don't have any of those cameras, please provide your feedback!)
- Improved conversion quality - pictures should have better tonality and sharpness.
- Added a control to open files in Photoshop right after saving (mark under Save button).
- Added "Save As ..." menu and support for storing destination files in history.
- Bug fixes, as always.

#### New features and bug fixes in 3.5.4:

- Fixed crash on saving Half-mode images in some cases.
- Fuji S5-Pro custom color profile.

#### New features and bug fixes in 3.5.3:

- Improved support for Fuji S5-Pro. Blending of R and S pixels. Dynamic range jumped to about 11 full stops, so don't be scared if picture looks a bit dark - use brightness and contrast sliders to adjust it. If you want to get rid of excessive dynamic range simply use exposure slider.
- Changes in UI - sliders now support keyboard sliding with left/right arrow keys and changed look a little to get rid of worthless tick marks.
- Performance improvements for dual-core Intel CPUs - Apply and Save should be over 25% faster now. For PPC only Apply operation is affected.