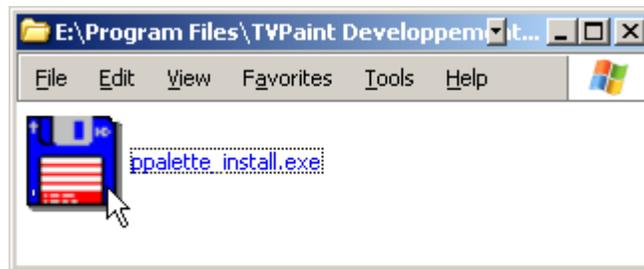


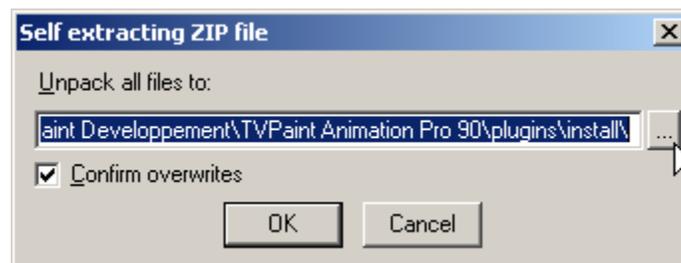
Perceptual Palette 7.12 User's Guide

Installation:

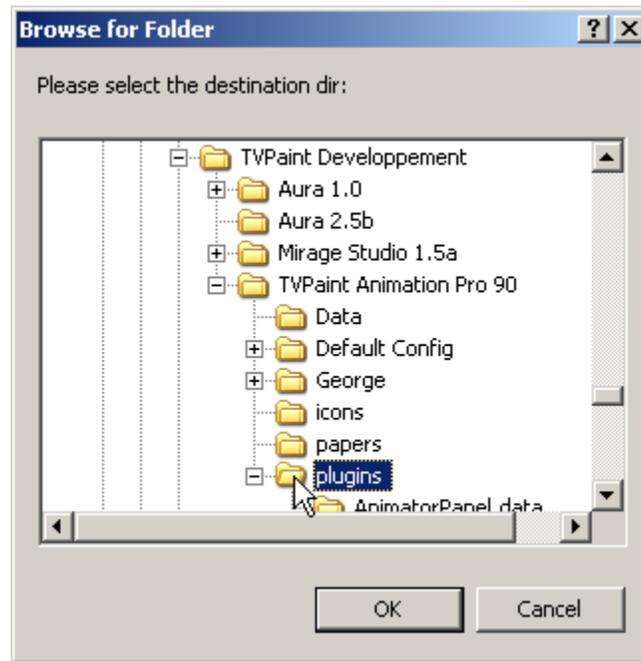
NEW As of June 18th, 2008, I have begun distributing my plugins as a self-extracting ZIP archive. Simply Double-click the archive to begin.



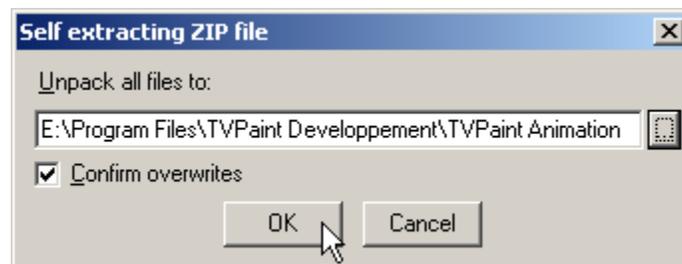
The following window will appear. DON'T just hit OK... instead, hit the little button marked with the “...” on the right side to browse for the installation directory.



Find the directory where you installed TVPaint. There should be a “plugins” directory in there. Make sure you highlight that “plugins” directory before you hit OK.



All right. Now you can hit ENTER (on your keyboard) or the OK button on this browser window to accept the installation directory. Hit the OK button on the installation program to begin.



Start TVPaint, or if TVPaint is running, restart it.

Once TVPaint is loaded, PPalette's Custom Panel should appear:

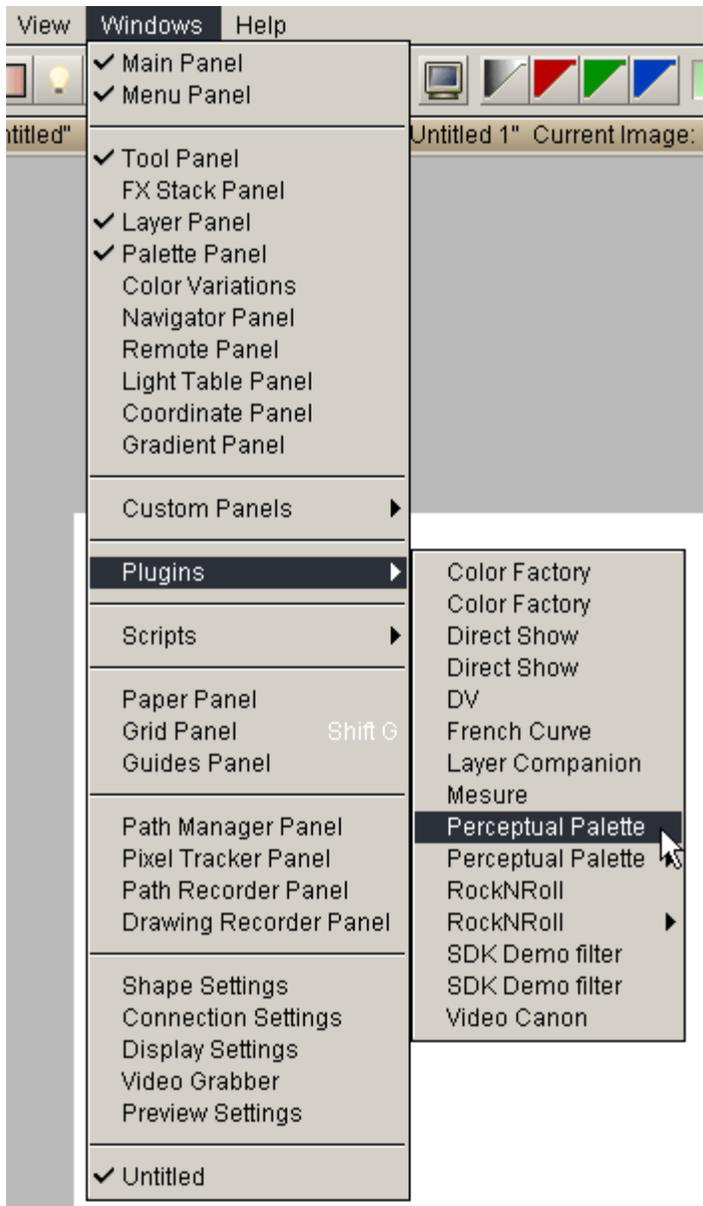
Shows the PPalette Window →	 ppalette
Activates the Weighted Colour Picker →	 PPalette: WCP
Activates the Dartboard →	 PPalette: Dartboard
Activates the Brush Size Tool →	 PPalette: Brush Size
Swaps the A/B Colours →	 PPalette: SwapAB
Refreshes PPalette's display →	 PPalette: Refresh
Activates PPalette's Darken Only Mode →	 PPalette: Darken Only
Activates PPalette's Lighten Only Mode →	 PPalette: Lighten Only

Having this Custom Panel loaded allows you to assign keystrokes to many of PPalette's functions.

Before you start painting, you should configure PPalette. In order to do this, you need to show the PPalette Window. You can do this a few ways:

You could just click this button →

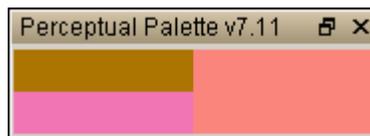




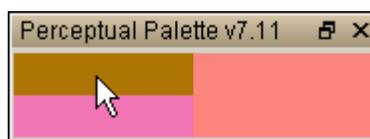
Or... you can go through the menu system to find it. You might have to do this if you don't have a handy custom panel button for that.

You could, of course, just copy PPalette's button from the custom panel included in the plugin into a custom panel of your own!

Anyways, this stumpy little window should appear:

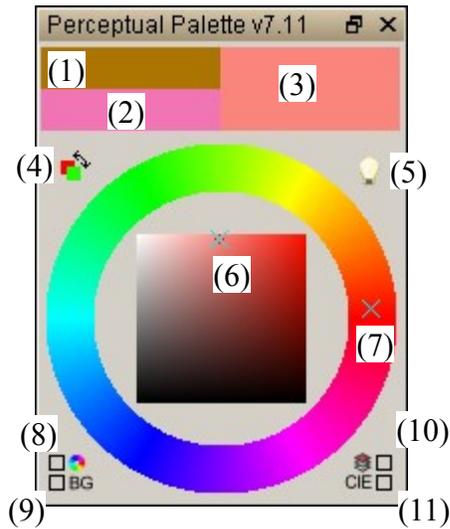


Right-click the left side to access the popup config menu.





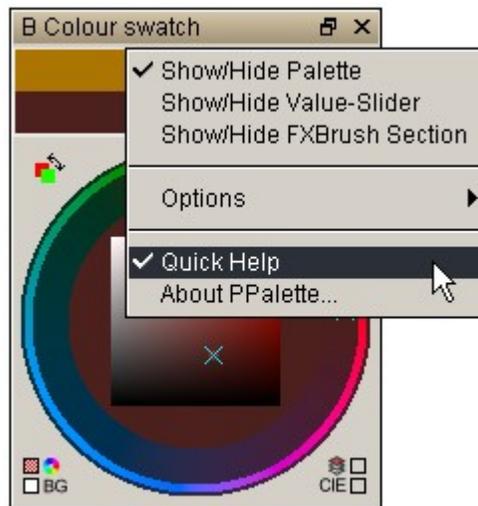
← First of all, I suggest turning this on.



Now the entire palette interface shows up!

- (1) B Colour Swatch
- (2) Previous Colour Swatch
- (3) A Colour Swatch
- (4) A/B Swap
- (5) Lighten/Darken Toggle
- (6) SATVAL Square
- (7) HUE Ring
- (8) HUE Ring Options Toggle
- (9) BG Toggle
- (10) Layer Options Toggle
- (11) SATVAL CIE Toggle

If you're in a real hurry to get started, just turn on the Quick Help and hover your cursor over any particular component.



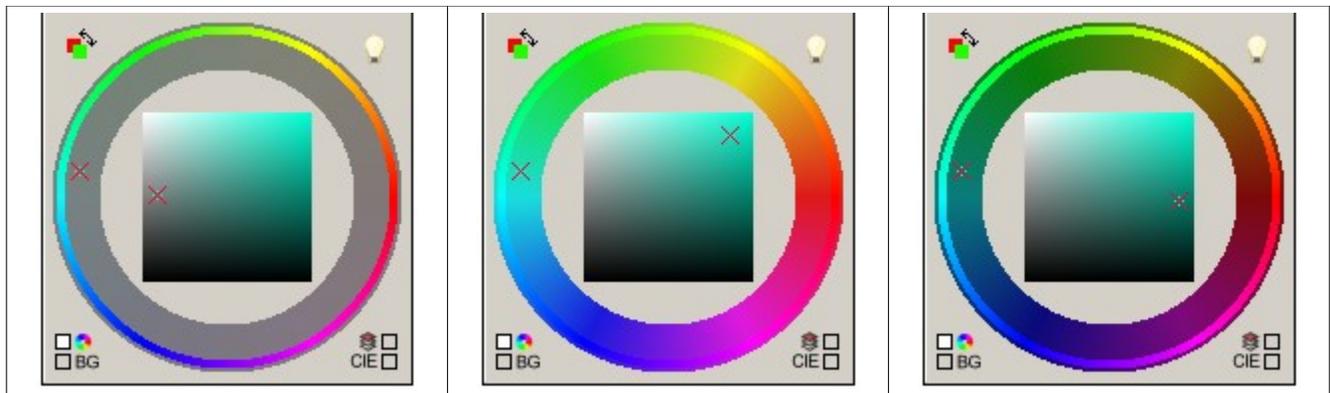
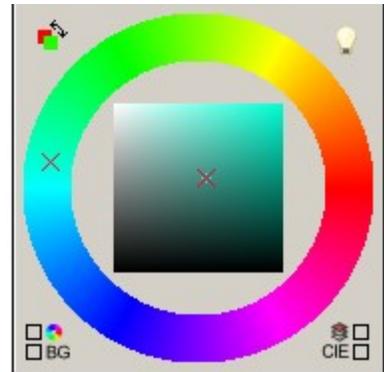
HUE Ring Options:



In the lower-left corner, there are two checkboxes. I'm just gonna talk about the top one, which affects the HUE Ring.

By default, this checkbox is clear. The HUE Ring appears just as any other HUE Ring you might find in other colour palettes.

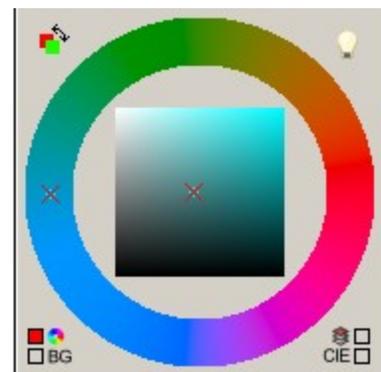
However, by clicking it with the Left Mouse Button (LMB) you can toggle the Dynamic HUE Ring. When it's ON, the checkbox will light up WHITE, and choosing a colour on the SATVAL square will cause the HUE Ring to darken or brighten to indicate the current **Value** chosen on the SATVAL Square, and also match its **Saturation** with whatever you've chosen on the SATVAL Square.



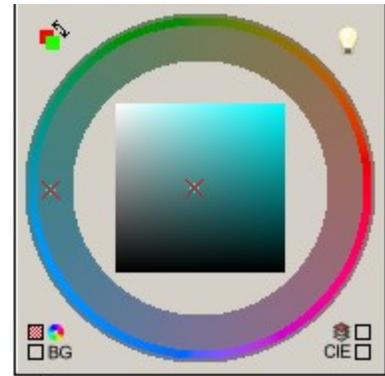
You might notice that on the HUE Ring, some colours will appear brighter or darker than others even though they all share the same luminance value. For instance, yellow shows up much, much brighter than blue does. People are sensitive to various wavelengths of light in varying amounts. We're more sensitive to Green than we are to Red, and more sensitive to Red than we are to Blue. This can make selecting colours of equal perceived luminance rather tricky!

So to make things a little easier, right-click the HUE Ring checkbox (not the HUE Ring itself) to activate CIE Luminance Compensation. The checkbox will then light up RED.

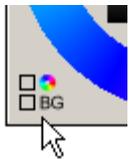
As you can see, bright colours like Yellow are now greatly muted to compensate and Blue has been bumped up as well. Overall, the ring is somewhat more equalized.



You can combine both options for the HUE Ring by left-clicking the checkbox to make it turn White (activating the Dynamic HUE Ring mode), and then right-clicking the checkbox to activate the CIE Luminance Compensation. When both options are on, the box will display a white and red checkered pattern.



BG Toggle:



Immediately underneath the HUE Ring toggle checkbox is the BG Toggle checkbox. Left-Click it to make PPalette display the current colour in the regions between the SATVAL square and the HUE Ring.



SATVAL CIE Toggle:



If you spin the HUE slider around, you will probably see the marker on the SATVAL square dancing about as it tries to compensate for the differences between “Numerical Luminance Values” and “Perceived Luminance Values”. Turn this toggle on to make the SATVAL square conform to the same CIE Perceived Luminance Compensation.

	
Without Luminance Compensation	With Luminance Compensation

Notice how in the example WITHOUT compensation, that colours in the highs and mid-range definitely appear darker on the right where they are more saturated, and lighter on the left as they desaturate.

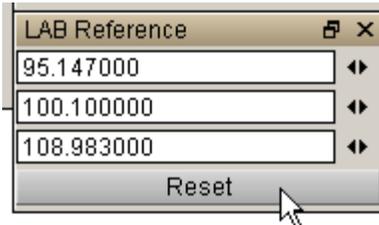
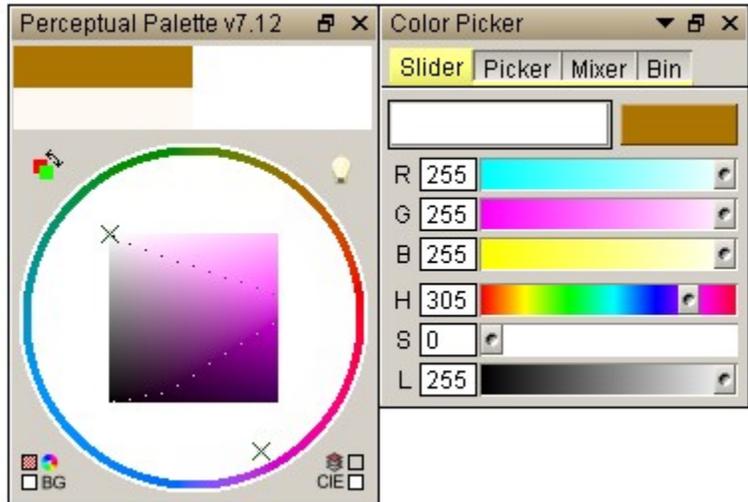
WITH compensation, things are evened out somewhat, but there are limits to the RGB colour space, which can only vary between 0-255 on any Red, Green or Blue channel. Due to the limits of the RGB colour space, PPalette cannot push values any higher than 255 in order to make a rather saturated colour match the brightness of its desaturated counterpart. Well, it may be possible to push the other channels up, but then the Hue and Saturation will begin to shift because the proportions between the Red, Green and Blue channels will change. Inversely, PPalette cannot push values lower than 0 to make very saturated dark colours match the darkness of their desaturated counterparts. The other channels will have to drop, and this will cause Hue and Saturation shifts as well.

This “clipping” phenomenon occurs with every photographic medium. Even cameras and the human eyeball have limits to the range of brightness and darkness they can represent. PPalette shows these clipping regions on the SATVAL square with dotted borders to indicate where a channel will hit “the attic of 255” or “the basement of 0”. Once you're past those borders, your colours will shift, just like they do when a photographic medium is overexposed or underexposed.

CIE Calibration

Before PPalette 7.12, the default CIE calibration was set to 100, 100, 100, which was kinda dumb, in retrospect because if you dragged the SATVAL square to the top-left, you'd get an off-white colour. This has been fixed for all versions after and including 7.12, but in case you upgraded from an older version, you may find that PPalette is incorrectly calibrated.

Turn on the SATVAL Square's CIE toggle and drag it to the upper-left corner. Show the Color Picker. If it shows up as 255, 255, 255, everything is fine. Otherwise, you'll have to manually reset the calibration by right-clicking the CIE toggle checkbox.



The LAB Reference Window should appear. Just click the “Reset Button, and the numbers will jump to weird values like the ones seen on the left. Now you can close this little window and forget about it.

Single Layer Mode



When working on a project with multiple layers, TVPaint's Standard Colour Picker will pick colours based off all of the visible layers merged together. If only want to pick colours off of the current layer when using the Weighted Colour Picker or the DartBoard Colour Picker, turn this on. Otherwise, leave it off! I use it mostly for when I'm training with a bit of photographic imagery loaded into a separate layer and I want to be a masochist by refusing to pick colours directly off the reference photo.

You can also freeze the AutoSampling Buffer by right-clicking this checkbox. (See AutoSampling for more details.)

A/B Swap

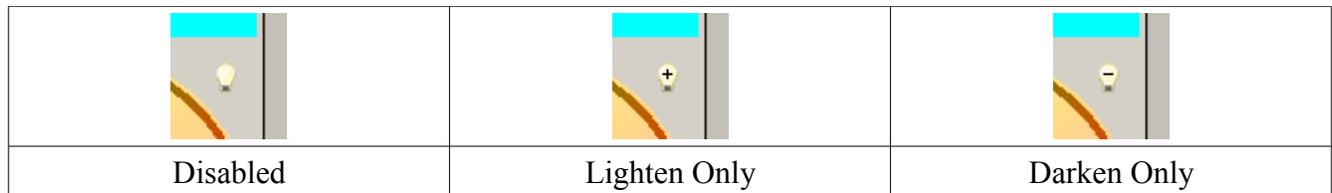


You can Left-Click this to swap your A and B Colours. Right-Clicking it will toggle AutoSampling. (See AutoSampling for more details.)

Lighten Only/Darken Only

In the upper-right, there's a little lightbulb icon that can be Left-Clicked to toggle Lighten Only painting mode, or Right-Clicked to toggle Darken Only painting mode.

These modes don't affect transparent portions of the image. When Lighten Only mode is active, then your paintbrush will only affect portions of the canvas that are darker than the currently selected colour. When Darken Only mode is active, then your paintbrush will only affect portions of the canvas that are lighter than the currently selected colour.



The HUE Ring and SATVAL Square

By now it should seem rather obvious as to what they do. Dragging on the HUE Ring with the stylus allows you to adjust the HUE of your colour, while the SATVAL Square shows a range of colours varying in luminance on the vertical axis, and saturation on the horizontal axis.

If your stylus has a side-switch configured to perform a Right Mouse click, then you can use it to perform fine adjustments on the SATVAL square by pressing lightly. (You will have to adjust your Stylus Pressure Setting, explained in the next section...)

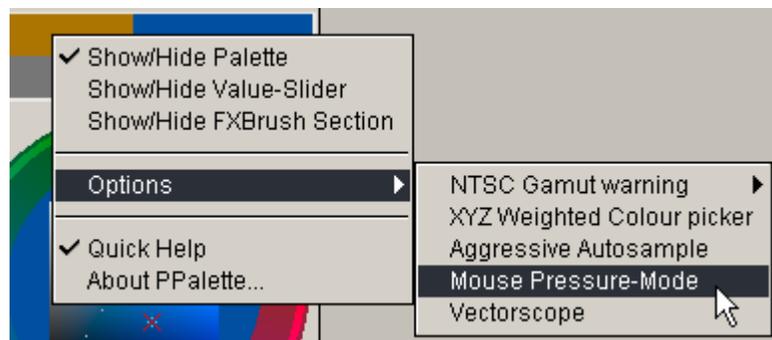
Left-dragging on the space between the SATVAL square and the HUE Ring will allow you to perform fine adjustments to SATURATION and VALUE. The softer you press with the stylus, the finer the adjustment. This is also dependent on the Stylus Pressure Setting.

If you're using TVPaint 9 and up, you can hold the CTRL key and make adjustments to the HUE Ring and SATVAL Square to change the colour of your most recent brush stroke.

Stylus Pressure Setting

If you're using a pressure-sensitive graphics tablet rather than a mouse, you might want to disable Mouse Pressure Mode.

After disabling Mouse Pressure Mode, you will be given the option to specify the sensitivity of the stylus pressure.

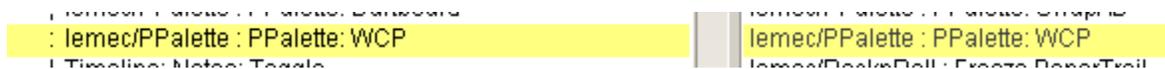


Lower values make the stylus more sensitive. You won't have to press very hard to greatly affect pressure-sensitive functions in PPalette, such as Right-Clicking. When Mouse Pressure Mode is active, PPalette will treat everything as if it's a half-press.

Weighted Colour Picker (WCP aka “The Scropper”)



The WCP is a fairly complex colour picker. First of all, you can activate it by assigning a hotkey to it, or you can use the Custom Panel Icon.

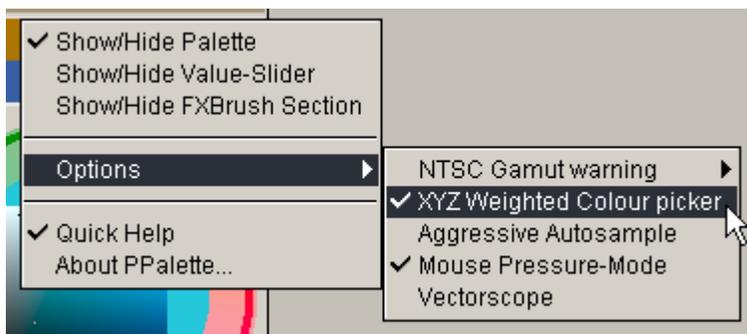


The WCP shows up as a circular reticle that follows your mouse cursor around. The very center of the reticle is completely transparent. The innermost circle indicates the colour of the pixel under your cursor. The middle circle indicates the current colour. The outermost circle indicates the colour you started with before you activated the WCP.

Dragging lightly over a colour with the stylus will cause the WCP to blend your current colour with the colour you're dragging over. Pressing hard will cause it to pick up colour instantly. When you release the stylus, the WCP will close and you may resume painting.

If you want the WCP to stay open, keep the CTRL key down. While the CTRL key is pressed, you can use the side-switch on the stylus to “un-blend” the current colour to match the colour of the outermost ring.

You might find that when you blend two very saturated colours on opposing sides of the HUE wheel, the colour will darken because the blending is a linear numerical blend between the two RGB values. To use a colour blending algorithm that is more accurate to perceived luminosity, activate the **XYZ Weighted Colour Picker** mode.



Some might ask why many of these luminosity-compensated modes aren't factory defaults. That's because they are unconventional. They're different from the standard colour mixing algorithms that everyone is used to. I don't want to cram all this luminosity-compensation stuff down everyone's throats so it's something you have to opt-in to.

The Relative Colour Picker (RCP aka “The DartBoard”)

This is a combined colour picker and pop-up palette. If you decide to use it, I highly recommend assigning a shortcut to it.

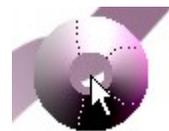
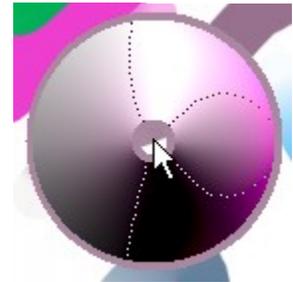
The SATVAL CIE mode MUST be active or it will have a garbled display!



The DartBoard was designed to help select ranges of colours found within a range of changing lighting conditions.

Here's how it works:

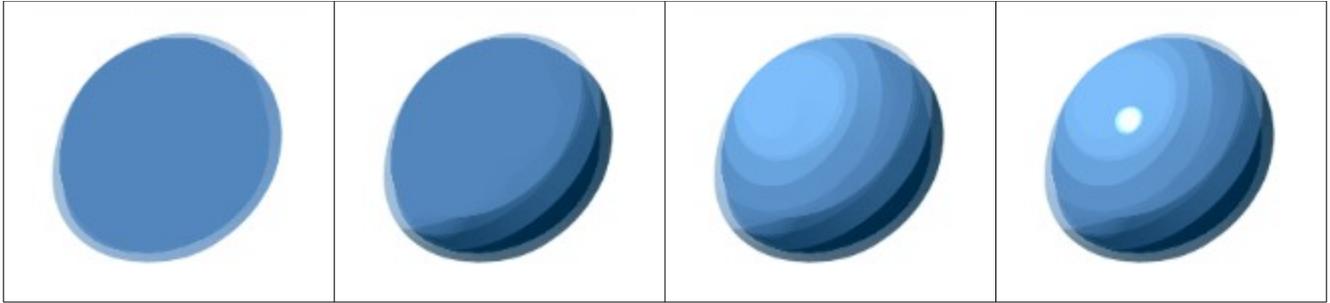
- First, move your stylus over the colour you want to sample.
- Hit the hotkey you have assigned to call up the DartBoard.
- If you want to select a different colour, you can just hit the same hotkey again to dismiss the Dartboard and try again, or you can drag the bulls-eye to slide it around.



- The colours on the Dartboard are arranged such that anything to the LEFT of the bullseye is LESS saturated. Anything to the RIGHT of the bullseye is MORE saturated. Colours ABOVE the bullseye are BRIGHTER than the current colour. Colours BELOW the bullseye are DARKER. The amount of saturation shift increases as you get closer to the outside of the Dartboard.
- Use of the Dartboard requires that you decide whether you intend to paint a region where MORE light is hitting it, or LESS light reaching that surface.

As less light reaches a surface, the darker the surface becomes – that should seem rather obvious. So if you want to indicate that your surface is turning away from light sources or that light is being blocked from reaching your surface, the colours you choose will be below the bullseye.

- If your subject is somewhat saturated and it receives light that is also somewhat saturated, but of a hue that is on the opposite side of the HUE ring, then the light will have a canceling effect. Although it will cause the material to illuminate, it may result in a more muted (desaturated) colour. If your subject is white or grey and the ambient light is a rather saturated blue and the direct light is also white, then the shadows will show that saturated blue while the directly lit regions will show a brighter shade of grey or white, depending on how much light is being received.
- What I'm trying to get at is you have to be able to compute in your head the changes in value, hue and saturation that occur as a surface receives varying proportions of coloured light, which interacts with the colours of the surface pigments. There are an infinite number of possible lighting situations and it's impractical to memorize them all. It's best to understand how coloured light interacts with coloured surfaces, and how multiple coloured light sources interact together.



- The Dartboard is intended to be invoked on top of other colours and used in conjunction with the Lighten Only/Darken Only painting modes. You have to be able to know exactly what will happen to your colour when the lighting situation changes, and then take a stab at it on the DartBoard.
- If you drag outside the Dartboard, you can change the HUE. You can also drag on the Dartboard itself after you click a colour.



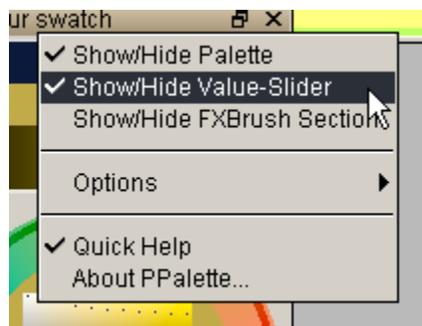
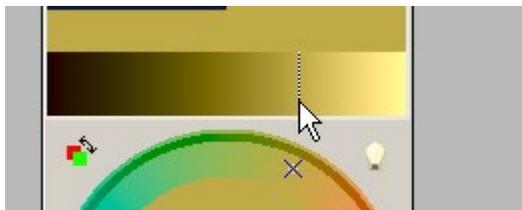
The Dartboard is an odd tool indeed, and it's something that was tailor-made to suit my understanding of colour transformations under changing lighting situations.

Value Slider

The Value Slider can be toggled from PPalette's popup menu.

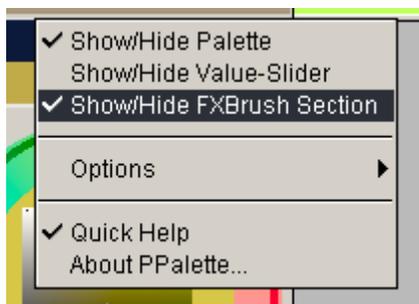
It's just another way to choose Value. You can:

- Select colours by dragging on it with the LMB
- Perform fine adjustments by dragging on it with the RMB
- Cycle through 3 modes by Ctrl-Right-Clicking it
- Toggle the "lock" by CTRL-Left-clicking it.



FX Brush

The FX Brush section opens up a bunch of buggy features that are arguably useful and annoying to maintain. If you are hopelessly in need of pretty paint effects, it might satiate your needs, but I rarely rely on it myself. It's there because some of my existing users would lynch me if I took it out.



As always, you can toggle it from the popup menu.



FX Stack Paint Mode

You can turn it on by Left-Clicking the little **FX Button** in the bottom-left corner. In order for this to work properly, you'll have to add some FX to the stack, first.

When you first turn it on, the light will turn GREEN and the FX stack will be applied but stored into the Spare buffer. Your paintbrush Drawing Mode will automatically be set to Merge. With this, you can "paint" your FX stack onto the canvas. For instance, you could set up Chroma Key and Blur in the FX Stack to create a brush that will erase Green/Blue screens, soften focus and kill mold and mildew.

Right-Clicking the **FX Button** toggle "overdrive mode", and cause the FX stack result to be recalculated with every brush stroke. If you have a lot of FX in the stack, or very complex filters, this is a **Bad Thing!** But it's there nonetheless.

Dirt

This will cause your brush to blend the currently selected colour with whatever is under your cursor as you paint. If you simply hover your stylus over your tablet, the colour will slowly revert back to the currently selected colour. It looks kind of pretty but it's prone to generating artifacts.

Load

This will decrease Power and Opacity as you paint. It's supposed to simulate your brush running out of paint, but it's also prone to artifacting and needs user-defined adjustments badly.

Rot

This works only with brushes that have an adjustable Angle and Aspect. Lift your stylus up out of range of the tablet, move back into range, and the brush will change its angle based on where your cursor jumps to. Buggy.

Brush Size Tool

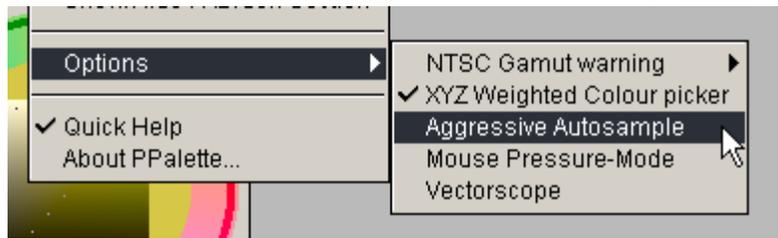
This is something that is best used if activated by hotkey. It's just like the brush resize tool in TVPaint, but redraws faster. Soon I will try adding aspect ratio and angle adjustments into this tool.

Autosampling

Okay, I procrastinated long enough... Autosampling makes the brush pick up colours from whatever is underneath it. You can quickly toggle it by Right-Clicking the **A/B switch**.



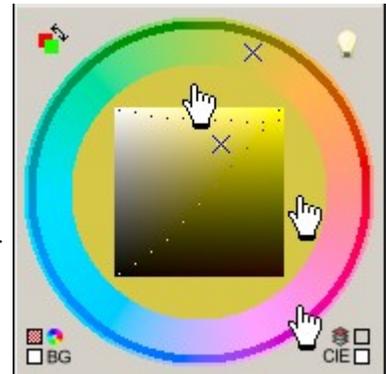
There's an “Aggressive Autosample” mode which will cause the brush to constantly Autosample during a brushstroke, but this will most assuredly introduce artifacts into your brush strokes.



If you only want to Autosample **Hue**, then you can right-click the HUE Ring.

If you only want to Autosample **Saturation**, then you can right-click to the left or right sides of the SATVAL square.

If you only want to Autosample **Value**, then you can right-click above or below the SATVAL square.



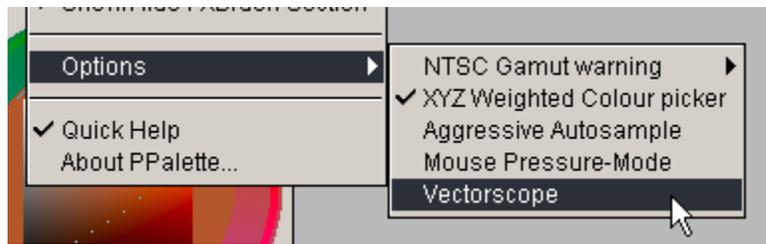
You can combine these toggles as well. A colour attribute with active autosampling will display a hatched region around it.

You can “**Freeze**” the autosampling buffer by right-clicking the **Single Layer Mode** toggle checkbox. This will make Autosampling unaffected by further brushstrokes. You might want this on if you are autosampling over a photo but don't want the autosampler to be affected by the brush strokes you put on. Or, you could show a layer, Freeze the buffer, and then hide the layer, but be able to autosample as if it was still visible.



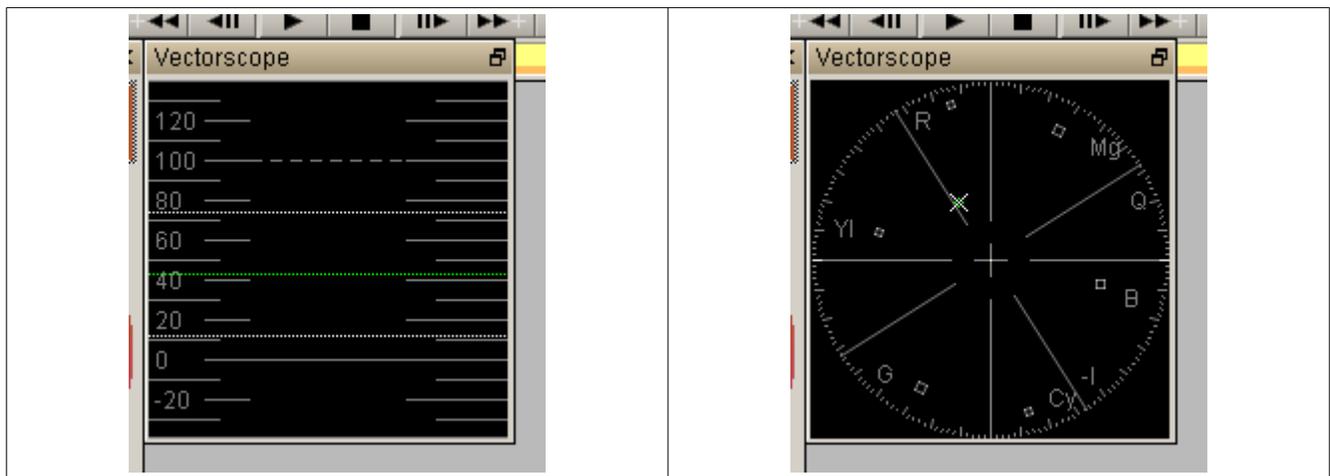
Vectorscope

This shows a little vectorscope window whenever you choose colours and shows where on the vectorscope it will show up. It's a tiny version of the one you can find under Windows->Plugins->Measure.



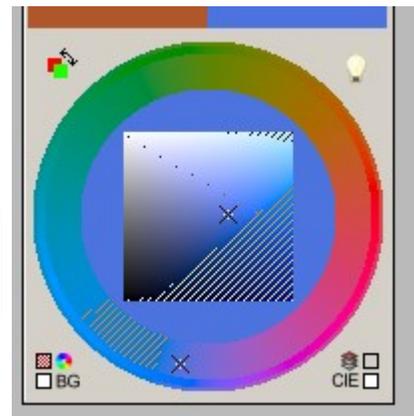
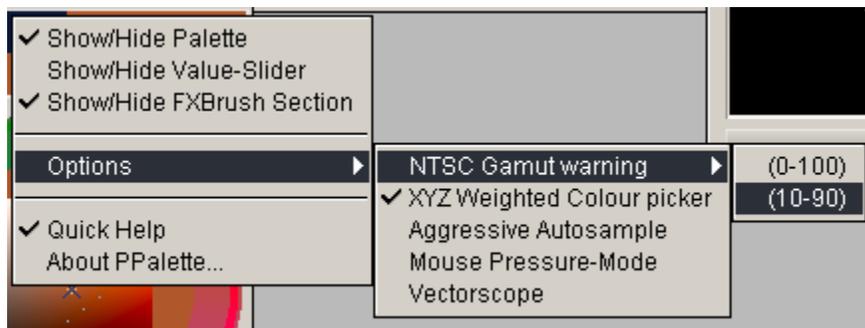
If you want to move the Vectorscope window, activate the **Weighted Colour Picker** and it will stay open so you can drag it about. Clicking the Vectorscope window will change its mode. As you move the WCP over your canvas, the Vectorscope will show where it sits within the “broadcast safe” range.

To find out more, visit: <http://en.wikipedia.org/wiki/Vectorscope>



NTSC Gamut Warning

Yet Another Weird Feature that I don't use. Turn it on to show which colours on the palette are not NTSC-safe.



Future Planned features that may never see the light of day:

HUE/Sat/Val Adjustment Mode

B Pen Autosample (for gradients)

Aspect/Angle Adjustments for Brush Size Tool

Tweak Dirt/Load pickup rates

Fix the Rot mode