

# Photoshop Sprite Creation Workshop Handout

EECS 494 – September 11 and 18, 2006

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## 1) Create a new image

- Click on File >> New. Set the name; here I chose "Tank."
- Set both Width and Height fields to 64 pixels, resolution as 72 pixels per inch, mode to RGB Color, and contents as White. Click OK.

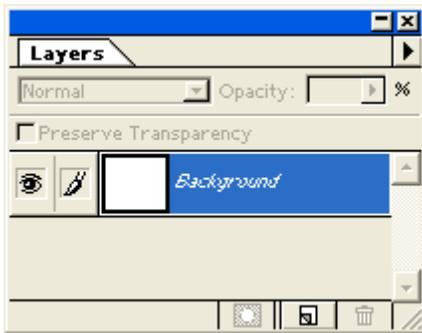
## 2) Zoom in

- Find the Photoshop toolbar. Click on the Zoom tool: 
- Click several times on the image. I recommend about five times. If you have a big monitor, maybe a few more.

**TIP:** Hitting the Z key is the keyboard shortcut for the Zoom tool. Also, clicking on the image with the Zoom tool while holding the **Alt** key will zoom OUT.

## 3) Create the tank body

- Find the Layers window.



**TIP:** If you cannot find a window (e.g. Layers), click on **Window >> Show Layers**.

- Create a new layer by clicking on the create layer icon at the bottom of the layers window.
- Double-click on the new layer (at this point it should be named "Layer 1").
- Rename the Layer "Tank Body." Click OK.
- Choose the tank color. Go the Photoshop toolbar and click on the Foreground Color. Choose a gray color of around R50, G50, B50.

**NOTE:** We're choosing gray colors because we're planning on doing some interesting effects with dynamic in-game coloring – in particular, we'll be doing real-time color modulation.

### **A note about real-time color modulation**

For real-time color modulation, we must first specify a color filter – generally **programmatically**. This is a simple RGB triple, but components range from 0.0-1.0, not 0-255. Pure green, for example, equates to the value  $\langle 0.0, 1.0, 0.0 \rangle$ . We also rescale source image pixels to within the range 0.0-1.0. For every pixel of the source image, we **modulate** it with our filter. One common modulation is multiplication. That is, for each pixel, we do a component-wise multiplication with the filter, and then emit the resultant pixel.

For example, if our source pixel is grey  $\langle 0.5, 0.5, 0.5 \rangle$ , and our filter is pure green  $\langle 0.0, 1.0, 0.0 \rangle$ , and we're *multiplying* colors, what is the resultant color? **Answer:  $\langle 0.0, 0.5, 0.0 \rangle$**  Another

example: If our source pixel is  $\langle 0.75, 0.75, 0.25 \rangle$  and our filter is  $\langle 0.5, 0.5, 1.0 \rangle$ , what is the multiplied resultant color? **Answer:  $\langle 0.375, 0.375, 0.25 \rangle$ .**

An interesting property of color multiplication is that the resultant color is **never brighter** than the input colors. (*Why?*)

- Click on the Marquee tool. (shortcut is *M*-key) 
- Make sure that you have the **Rectangular Marquee Tool** selected. Not, for example, the **Elliptical Marquee Tool** (see tip below).

**TIP:** Sometimes, the Marquee is not rectangular - it may be an oval, for example. To change the Marquee shape, hold the mouse button down on the Marquee tool. Click the Rectangular Marquee Tool - far left. Many tools are "hidden" in this way.

- Examine your Marquee options window. If no such window is visible, go to *Window >> Show Options*.
- Set Feather to 0 pixels.
- If applicable, uncheck the Anti-aliased property.
- Set Style to Normal.
- Click somewhere around the upper-left-hand corner - approximately where one corner of where you want your tank body - and drag to somewhere around the lower-right-hand corner - the opposite corner. I recommend from about  $\langle 10, 7 \rangle$  to  $\langle 54, 50 \rangle$  for a well-centered, solid tank body. Release the mouse. You should have a roughly rectangular area selected.

**TIP:** Use Guides to help you place your tank body. Click down on the rulers and drag out to the image and release to place your guide. You can manipulate your guides on the View menu. e.g. *View >> Hide Guides*.

- Click on *Edit >> Fill*. Set *Use* to *Foreground Color*, *Opacity* to *100%*, *Mode* to *Normal*. Uncheck *Preserve Transparency* field. Click OK.

#### 4) Create the tank treads

- Create a new layer. Rename it "Left Tread." Select that layer.
- Choose a new color for the tread. I recommend R152, G152, B152.
- With the rectangular Marquee, select an area from  $\sim \langle 0, 0 \rangle$  to  $\sim \langle 14, 64 \rangle$ .
- Do *Edit >> Fill*. Click OK.
- Right click on the "Left Tread" layer. Select "Duplicate Layer..."
- Change the *As* field from "Left Tread copy" to "Right Tread."
- Click on the Move tool. (shortcut is *V*-key)
- Drag the area to the right side of the image. Make sure that it lines up OK.

**TIP:** Hold down the **Shift** key to constrain to movement to a single dimension. Also, you can Move with the arrow keys. Hold **Shift** down for longer distances (default 10 pixels).

#### 5) Create the cannon

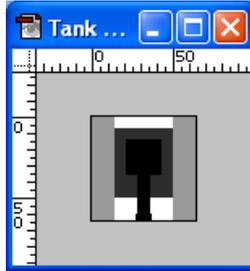
- Create a new layer. Rename it "Cannon." Select that layer.
- Choose black for your new color. That is, R0, G0, B0.
- Using the Rectangular Marquee Tool, select an area from approximately  $\langle 21, 14 \rangle$  to  $\langle 43, 36 \rangle$ .
- **WHILE HOLDING DOWN THE SHIFT KEY**, select another area approximately from  $\langle 28, 35 \rangle$  to  $\langle 35, 64 \rangle$ . This *adds* the area.
- Do *Edit >> Fill*. Click OK.

**Now we're going to add the "bell" of the cannon.**

- Change to the Pencil Tool from the toolbar. (shortcut is *N*-key)

**NOTE:** You might not be able to find the pencil button on the toolbar; but there may be a line button. Click and hold the mouse over this button and choose the pencil.

- Draw in the bell at the end of the cannon. Try drawing it both with the pencil and the line tool. Constrain the dimension of the line and pencil tools with shift.



## 6) Create the bullet

- Create a new window via *File >> New*. Name the new window "Bullet". Dimensions: 8 x 8 at 72 pixels per inch. Use a white background.
- Create a new Layer in this window also called "Bullet"
- Zoom in all the way (1600%).
- Choose a color for your bullet. Let's choose R100, G100, B100.
- Choose the Marquee tool, but this time, use the *Elliptical Marquee* (by holding down and selecting on the button).
- Drag a circle from the upper left-hand corner to the lower right hand corner. Hold down the *shift* key to constrain to equal width and height.

**TIP:** If you've selected poorly, just click off of the image (the grey area) and try again.

- *Edit >> Fill* with the foreground color.

### For added depth, let's add lighting effects to our bullet.

- First, duplicate the layer. Rename the new layer "Lit bullet."
- Reset the current foreground to black and the background to white by clicking on the reset color button.
- Do a *Select >> All*.
- Change to the Move tool.
- Tap the right and then the left arrow keys to select all pixels that are greater than 50% selected for this layer.
- Go to *Filter >> Render >> Lighting Effects*. Adjust the parameters and position so that it looks good. You're probably going to want make the area pretty small.

## 7) Create the logo

- Create a new window via *File >> New*. Name the new window "Logo." Dimensions: 278 x 90 at 72 pixels per inch. Use a white background.
- Create a new Layer in this window also called "Logo."
- Click on the Type Tool. Click inside the image window.
- Choose a font and weight. For this, I'm using the font *Copperplate Gothic Bold* with a point size of 54. Type in "DXTANK" into the text box.
- Duplicate the layer, and rename it "DXTANK - Working."
- Disable the "DXTANK" layer.

- We now must *RENDER* the layer. At this point, we won't be able to edit the text anymore, but we gain the ability to do transformations and cooler embellishments on the text. Go to *Layer >> Type >> Render Layer*.
- Let's stretch the text. Go to *Edit >> Transform >> Scale*. Move the handles to taste. Once you are done, if you are happy with the results, double-click on the image. Otherwise, click on the toolbar. You will be asked if you want the changes applied. If you click *Don't Apply* you can start again.
- Let's adjust the perspective for a more dramatic effect. Go to *Edit >> Transform >> Perspective*. Make the bottom narrower and the top wider.

**TIP:** You can **chain** these operations before committing them.

- Let's add a bit of flair. Duplicate the layer and name it "DXTANK - Shadow." Duplicate it again and name it "DXTANK - Occluder." Disable all layers except "DXTANK - Shadow" and the background. Select "DXTANK - Shadow."
- Go to *Filter >> Gaussian Blur*. Choose a radius of around 1.5 to 2.0 pixels.
- Enable "DXTANK - Occluder" and select it. Go to *Image >> Adjust >> Invert*.
- Try moving the shadow around to taste. For a more dramatic effect, duplicate the shadow layer several times.



## 8) Create a BOOM!

- New Image. 64 x 64, white background, 72 PPI. Name it "Boom!"
- New Layer: Boom! Select this layer and zoom in.
- Choose the *Polygonal Lasso Tool*. Draw a star with this lasso. *Double-click to auto-connect* to the first vertex of the polygon.
- Choose a good color for your boom. I recommend a good orange.
- Let's add more layers. Duplicate the layer to "Boom 2."
- Let's change the color of this layer. Go to *Image >> Adjust >> Hue/Saturation*. Change the Hue and possibly the Brightness.
- Do an *Edit >> Transform >> Rotate*. You may also want to scale. Hold down *Alt* to scale from center! *Shift*, as always, constrains proportions.
- Let's do one more boom layer. Copy "Boom! 2" layer into "Boom! 3."
- Do a **Radial Gradient**. Select Foreground to Background under the options. Draw the gradient from the center outwards.
- *Edit >> Transform* this layer to taste.
- Add BOOM Text. Verdana 16 Bold is nice.
- What if you want the explosion to "shine through" the text? Adjust the Opacity of the layer. 70% is pretty good.

**TIP:** I recommend you play around with layering effects other than Normal.



## 9) Embellish the tank

- Add some depth to the body with the *Reflected Gradient Tool*.
- Duplicate the body layer. Add some noise to the body via *Filter >> Noise >> Add Noise*. Use Monochromatic noise, and use a fairly small amount: e.g. 5 - 15.

- Duplicate the cannon layer. Round the new cannon edges.
- Duplicate the new cannon layer. Copy and paste the body's texture into the selected cannon. *Edit >> Paste Into.*
- We will have to do this a couple of times because the cannon is longer than the body. Once done, link the layers and merge them. The masks for both layers will go away.
- Duplicate this layer and *Edit >> Stroke* the cannon with Black into a NEW LAYER.
- You may also want to adjust the Hue/Saturation or Brightness/Contrast of the new cannon. I recommend adjusting Brightness/Contrast. *Image >> Adjust >> Invert* is also useful.
- For greater depth, you can try moving the stroke behind the cannon. I recommend having two versions of the stroke: One for on top of the tank body, and one sticking out in front. Separate the stroke into these two components.
- *Filter >> Blur >> Gaussian blur* the stroke that is on the tank. You may want to duplicate this layer for a more dramatic effect.
- Select and duplicate the left tank tread. Add some noise. I recommend an amount of about 5 this time - again monochromatic.
- Copy this layer to the right.
- New layer above the left tread. Draw some detail lines. Duplicate them and move down. Do a "multiply and conquer" layer merge; copy and paste to achieve this quickly.
- Adjust opacity if desired.
- If you want a rougher look, change the layer from a normal layer to a dissolve layer. You're going to want to lighten up your tread detail color if you do this, though. Here, we do both.
- Duplicate these new layers and move them to the right tread. Do an *Edit >> Transform >> Flip Horizontal* on both layers.

## 10) Exporting

- *File >> Save a copy.* Save as PNG, for example. For best results, EDIT your PSDs and export into your target format.

## 11) Add an alpha channel to the tank

- Duplicate the tank by left-clicking on the title and selecting Duplicate. Name it "Tank Alpha."
- Do a *Layer >> Flatten Image* on Tank Alpha.
- We want to select the area that we want to be transparent. Using the magic wand tool, select the white areas. You can additively select by using the *shift* key, if needed.
- Fill the area with black.
- Do a *Select >> Inverse.*
- Fill this area with white.
- Do a *Select >> All.*
- Do an *Edit >> Copy.*
- Change back to our original image. Open the Channels dialogue (*Window >> Show Channels*) and create a new channel. It should say something like "Alpha 1."
- Do an *Edit >> Paste.*

**NOTE: Why does the alpha channel show up magenta?** When you create an alpha channel, it is set to a default display color and opacity. For my computer, it's pure red at 50% opacity. These color values don't have any real value with respect to the actual image; it's just so that you can see the alpha channel when you're editing it. These values can be changed by double-clicking any alpha channel (or layer mask, also in the channels) and adjusting the values in the dialogue. Note that, of course, color adjustment is only possible for non-RGB channels.

To specify transparency, you also have the option of specifying a *color key*. That is, a color that indicates a certain area is transparent. Explanation of both color-keying and alpha-channeling – and the pros and cons of both – are given below.

### Color-keying vs. Alpha-channeling

To create transparent areas in your images in the DXFramework, you have two options: color-keying and alpha-channeling.

For color-keying, you specify pixels that you want to be transparent with a certain *key color* specified within the framework. By default I think this color is a bright magenta, but this can be changed. When the framework renders your image to the screen, pixels whose color matches the filter color *exactly* will not be drawn; all other pixels will be drawn as usual. The downside to this method is that pixels can only be drawn at either full opacity or full transparency; you can't, for example, draw pixels at 50% opacity with this approach. The advantage is that it is simple, quick and easy.

Alpha-channeling, on the other hand, allows you 256 levels of gradation between full opacity and full transparency. It achieves this by treating opacity values – or *alpha* – as a full-fledged channel, just like the red, green, and blue channels. In other words colors are 4-component, rather than 3-component. The upside of the alpha-channeling approach is that you can take full advantage of this continuum of opacity values. The downsides are that it is usually more work to create alpha-enabled images; furthermore, 4-component images are general 4/3 the size of 3-component images.

## 12) A brief course on Layer Masks

Say we want to create a kind of permanent stencil on our image, and then draw freely within that stencil. Layer masks are ideal for this task.

- Let's create an image. Do a File >> New. Name the new image "Graffiti." Specify width and height as <512, 256>. Set background as white.
- OR, load your favorite image and paste it as a new layer into your new image.
- Create some **BLACK** text in a new layer called "stencil." Render it by doing a Layer >> Type >> Render Layer.
- Create a layer mask by dragging the layer to the Add Layer Mask button at the bottom of the Layers dialog.
- Select the layer (NOT the mask!!)
- Delete the contents of the layer.
- Airbrush around, or fill it with another image, for example.

## 13) Saving selections as channels

You can save current selections (in whatever layer you happen to be) as channels by going to the channel dialogue and clicking on the "Save Selection as Channel" button. You can do the reverse as well!

I tried doing this in class Monday – and failed. I figured out what the problem was, though. Once I created my selection, I needed to re-enable all channels. To do this click the RGB channel in the channels dialogue. Then, go back to your layers. Copy your image data from the reference layer and then paste into a new layer. From then you can edit hue and saturation, or whatever else you want to do with your new selection.

## 14) Odds and ends

We covered briefly each of these features in class. For more information, I suggest you do searches on the web. The terms below will help to effectively direct your searches.

- Eyedropper tool – *obtain a color from the image and load it into your foreground palette*
- Magic Wand tool – *select regions of the same or similar color*
- Airbrush tool – *paint like a can of spray-paint; graffiti*
- Smudge tool – *blur or smear pieces of color across the canvas*
- Tab – *press **tab** to toggle visibility of all Photoshop dialogs*
- Cropping – *crop images to reduce the dimensions of the canvas to your selected area*