Houdini
3D ANIMATION TOOLS

Houdini
Light, Shade, Render

M03: Modifying the Mantra Surface Shader (cont.)

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Agenda

- Continuation from last week
  - Reusing OTLS and Toolbars
  - Creating a VOP based Digital Asset
  - Promoting vs Exposing Parameters
  - Creating Ramps that can be used in a shader
  - Ramp Filters
  - Making our Network more Generic
  - Testing the Network
  - Converting to a Digital Asset
  - Fixing the User Interface
  - Problem with Multiple Ramps
  - Solution to Ramp Problem

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Setup

If you do all this you will get your teapot automatically loaded with lights and camera. Plus you will have a material already created for testing

- Create a new project folder LSR.MO3.OO1.OO1
- Copy from last week into project folder
  - 1. materialtester_vOO1.otl
  - 2. Toolbar LSR.shelf
  - 3. ranCircles_vOO1.gal
- From Module O1
  - 456.cmd that makes a shopnet at the scene level

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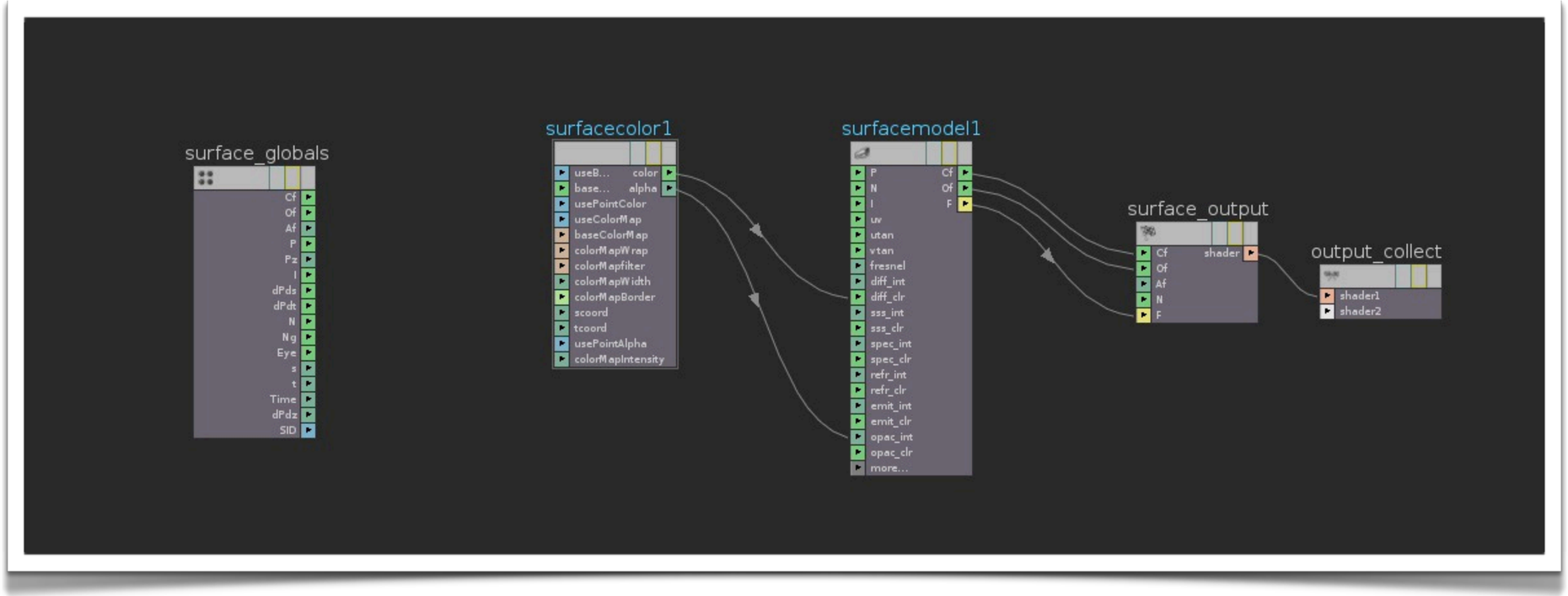
Let's Begin

- Add a Material Shader Builder to the myMaterials SHOPNet
- Delete the Displacement Globals and Displacement Output Node
- Wire up a Surface Model and Surface Color Node



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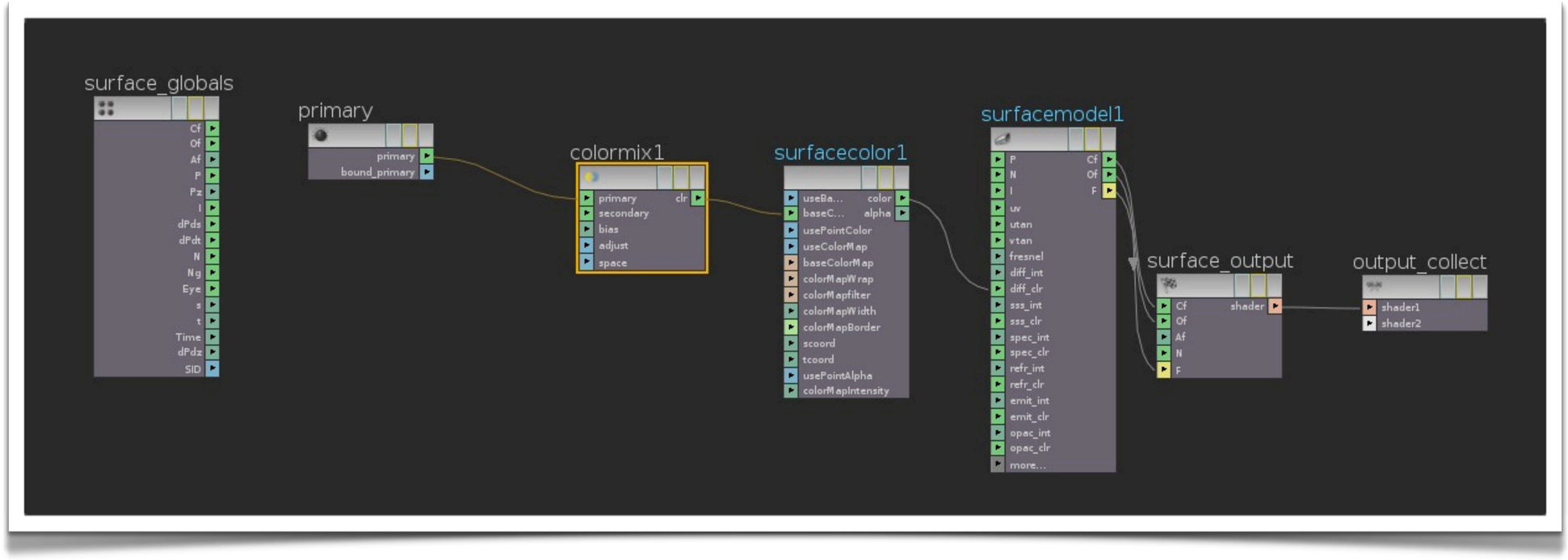
Next Step

- Drop down a colormix VOP
- Notice promoted the primary color of the color mix and exposed it
  - We need to expose it if we want to make a proper Digital Asset



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Quick Test

- Add a color map to the Surface color
- Change color to primary color of color mix
- Notice that you are tinting the color map

The snail is upside down!

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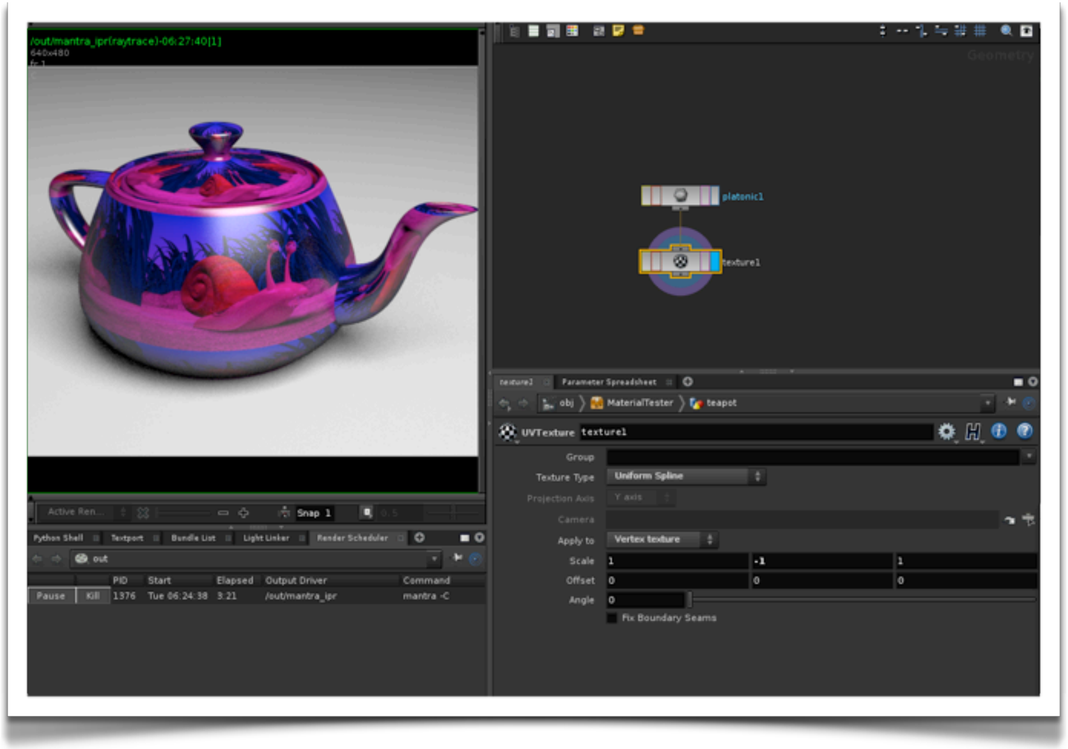
To Correct the Upside Down Texture



- Select the Material Tester Digital Asset
  - Right Click and allow Editing
  - Dive down and select teapot
  - Dive into teapot
    - Add a uv texture node
      - Texture Type - Uniform Spline
      - Apply To - Vertex Texture
      - Scale y to -1
- Pop back up to Material Tester Digital Asset
- Right Click on Asset and select Save Operator Type
- Right Click on Asset and select Match Current Definition

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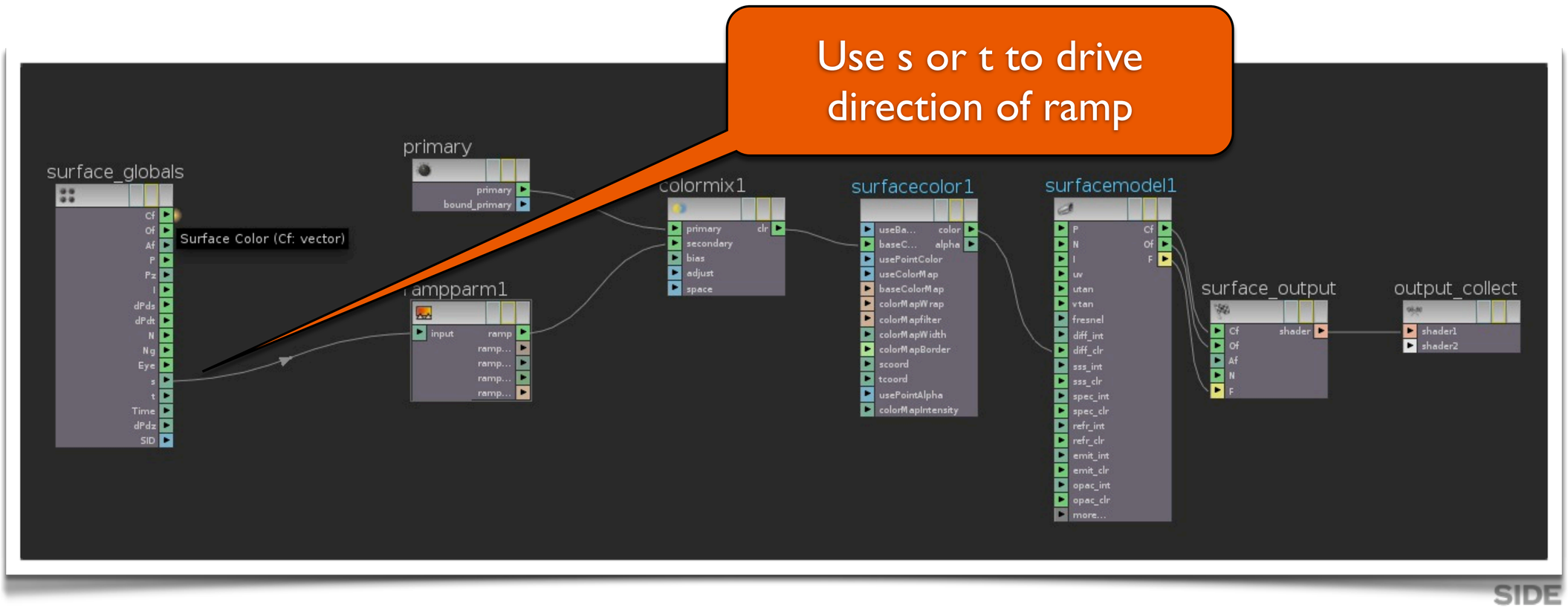
Working with Ramps

- The Ramp Parameter node represents a ramp user interface. The input specifies an index into the ramp. The value of the ramp at that position is the node's output.
- Ramp Type -Whether this parameter is a color ramp (vector) or spline (float).



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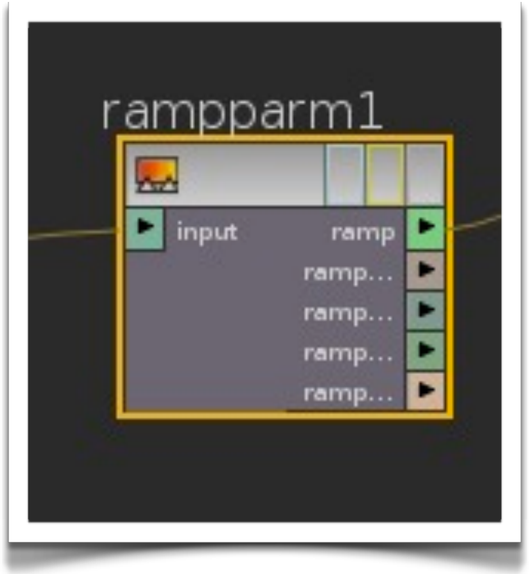
ramp parm

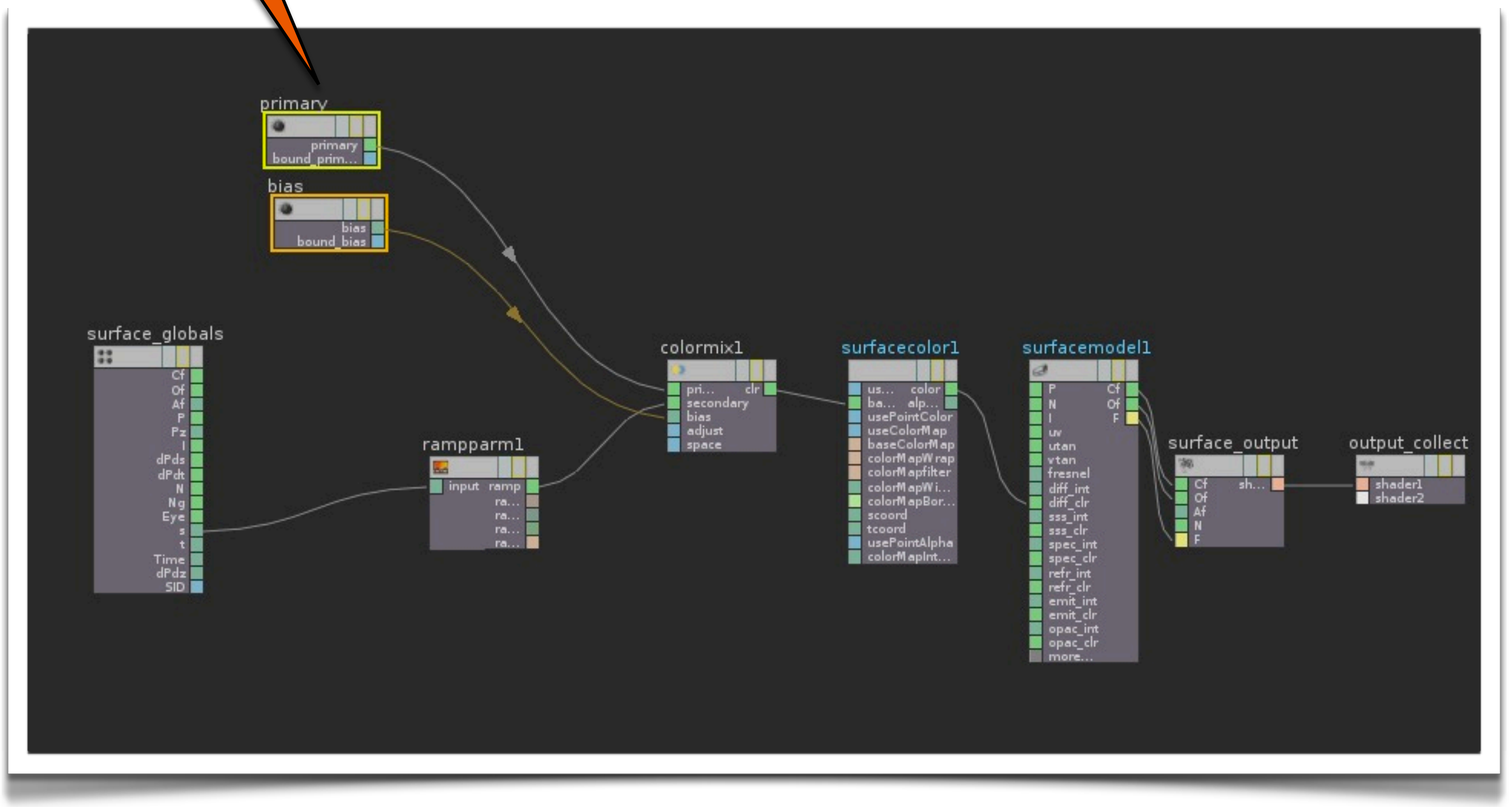


- One off - this is an issue since if you look at output of the parms they are not vectors or floats
  - string arrays
  - float array
  - vector array
  - string
- These data types work with the parameter filter
- ramps are not supported as a datatype (one off)
- Embed ramp in digital asset? Need to do special stpes.

Expose bias

Notice items I want in user interface are exposed and pulled to the side

- Promote bias of Color Mixer
- Expose input



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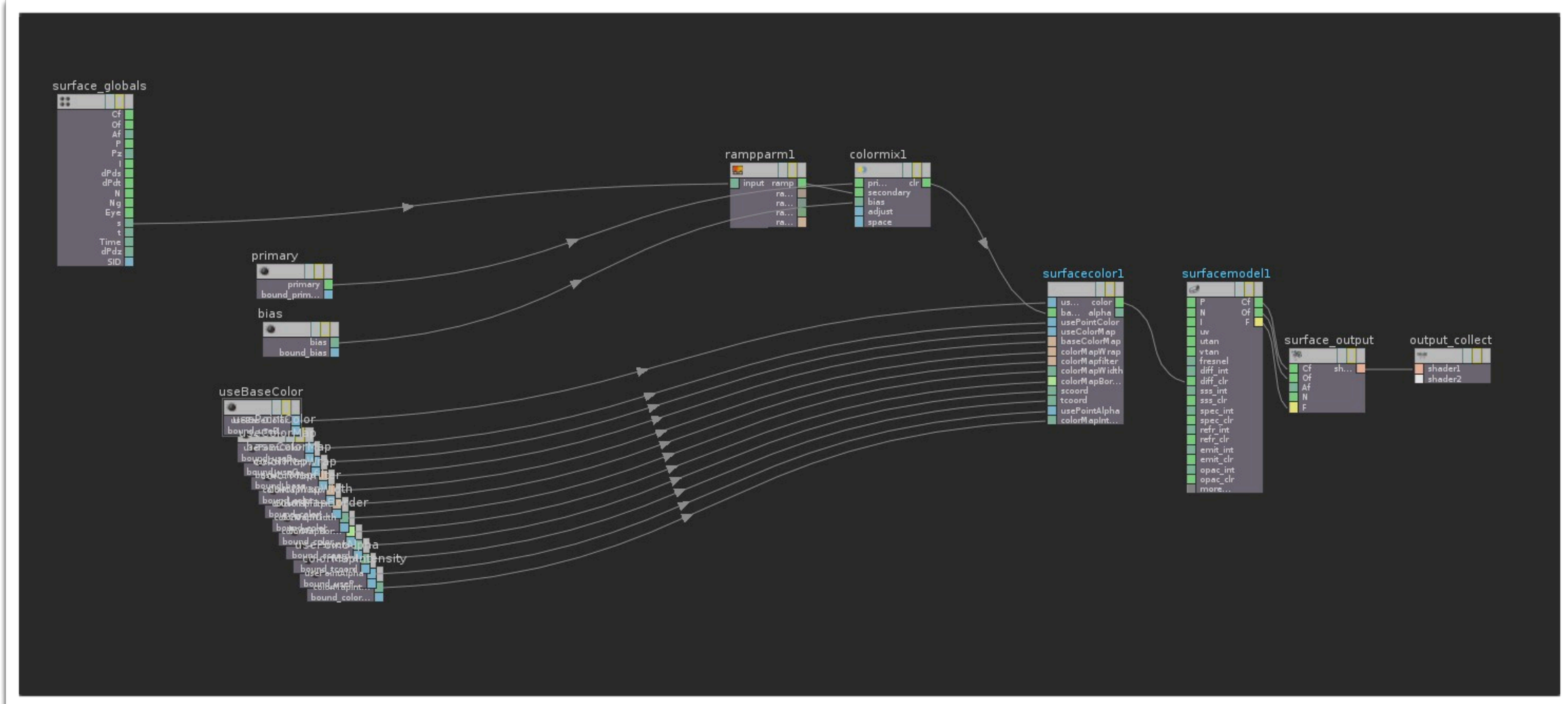
Continue Exposing Parameters for User Interface



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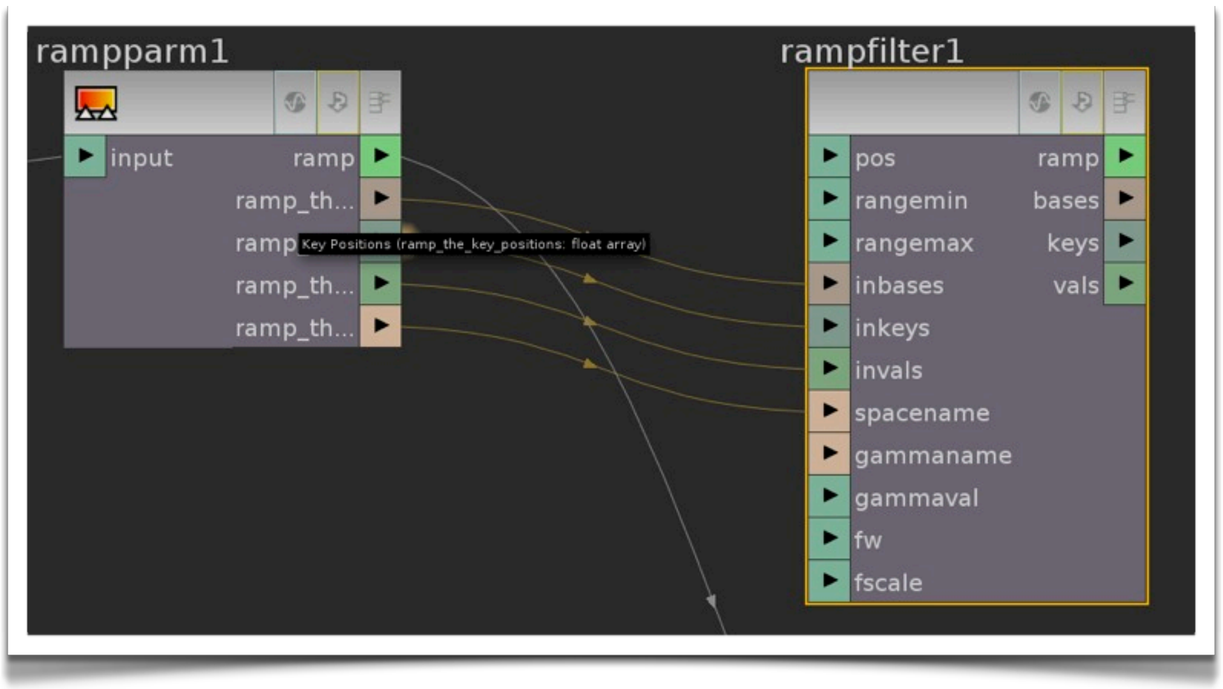
Add a ramp filter



- ramp filter is for very high frequency noise
- specifically in volumetric rendering where there is very high noise
- ramp filter will anti-alias the noise
- input = position
- diff_color of string goes into spacename

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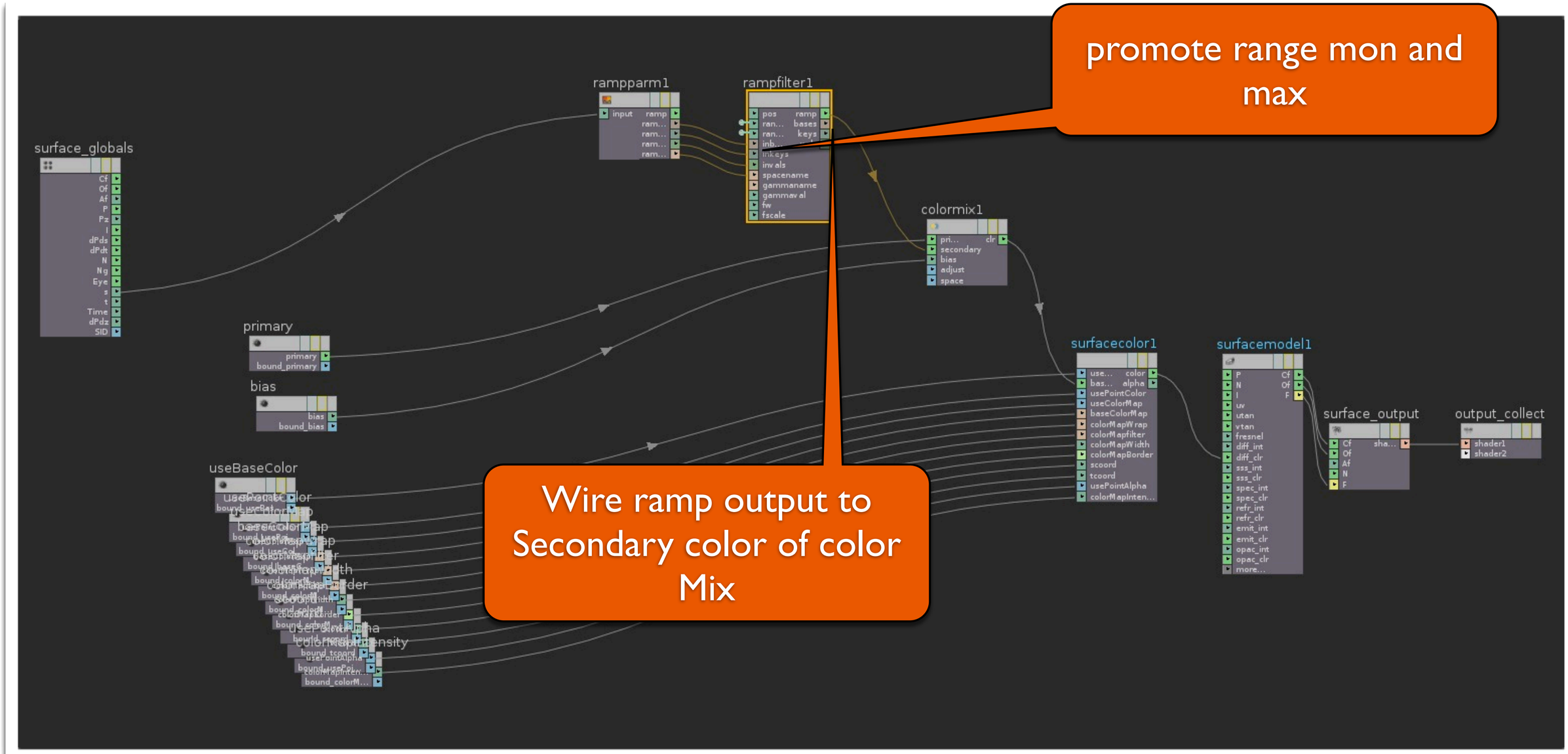
Now we can have a range min and max



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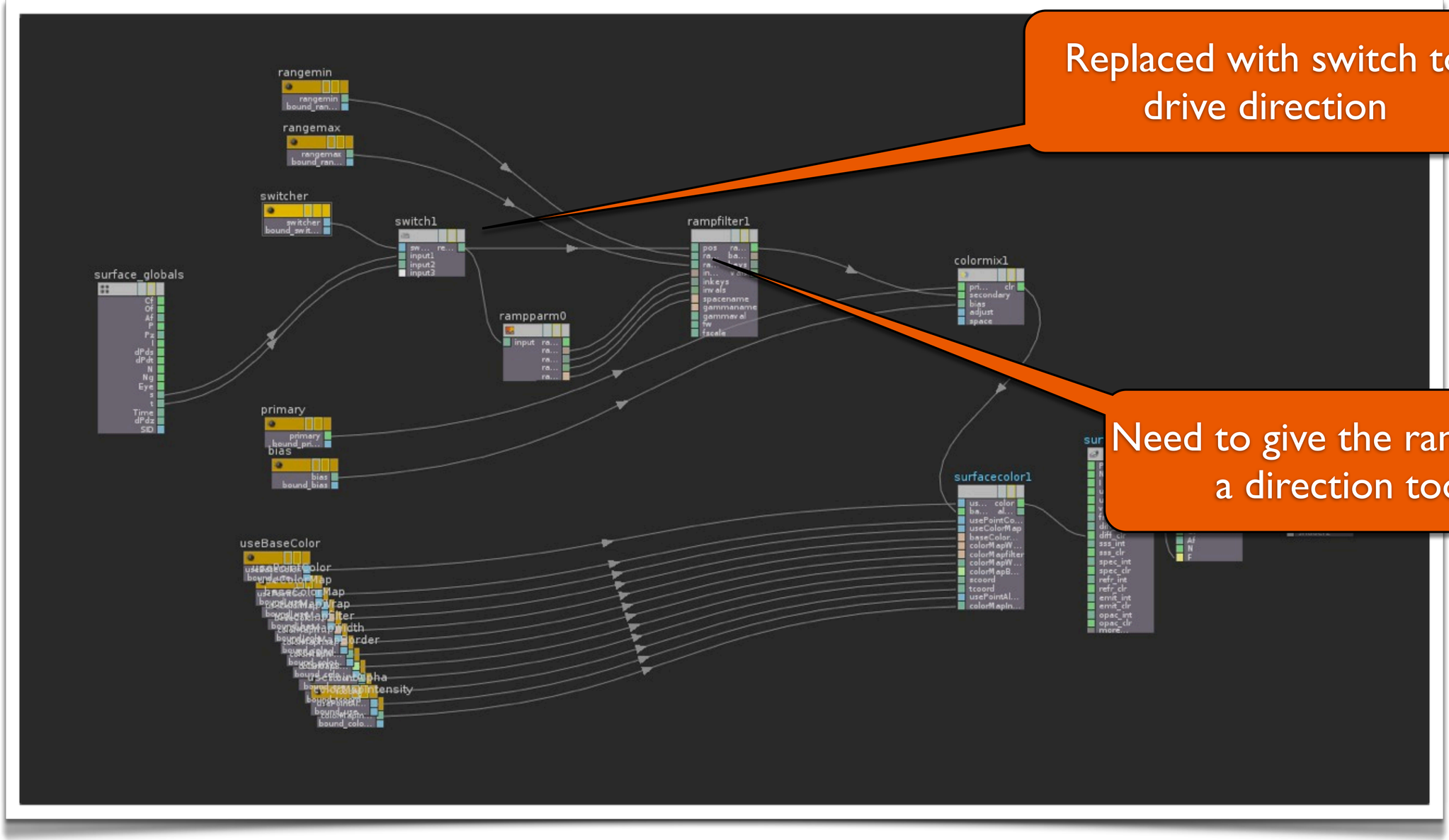
All wired up



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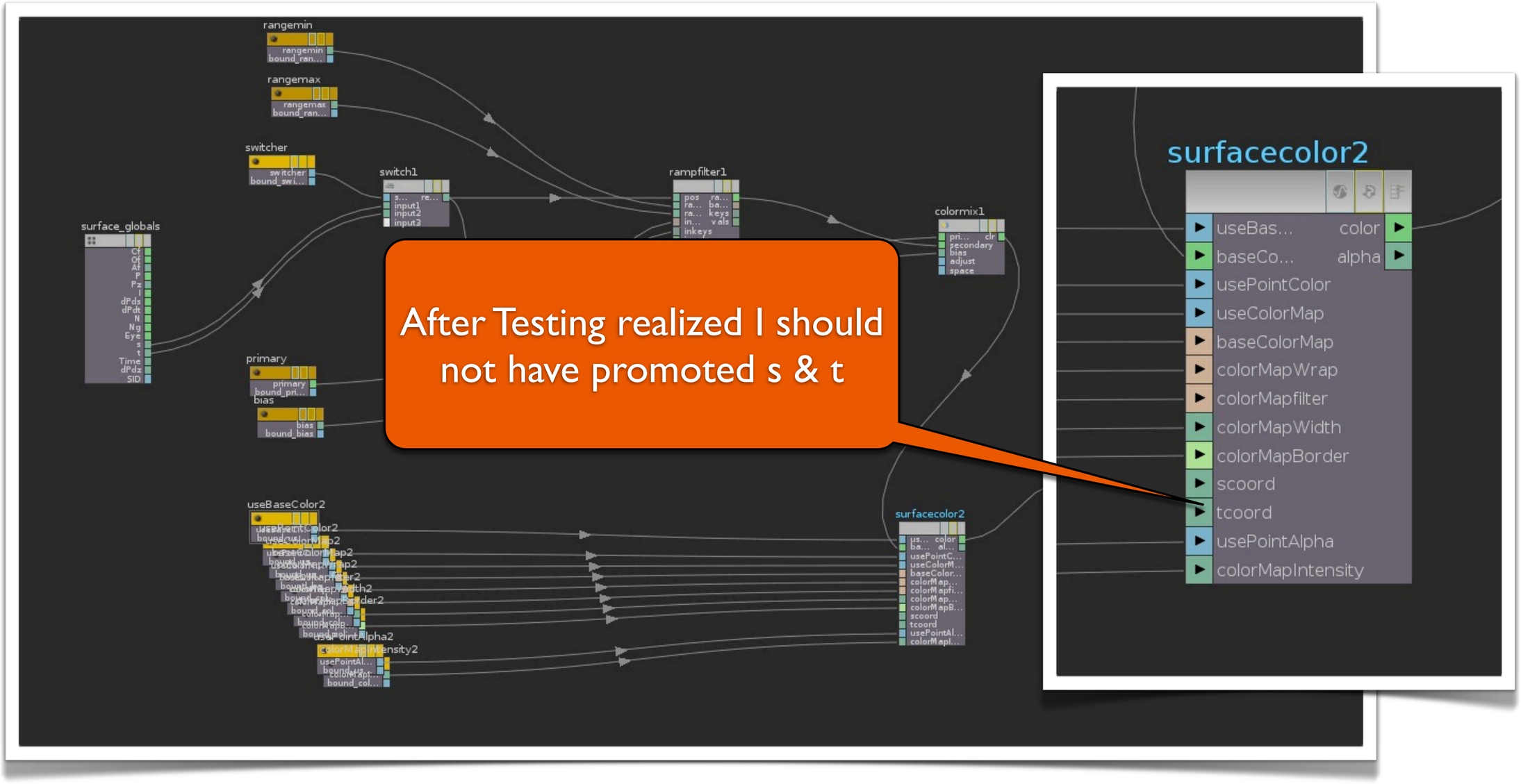
Test before making a Digital Asset



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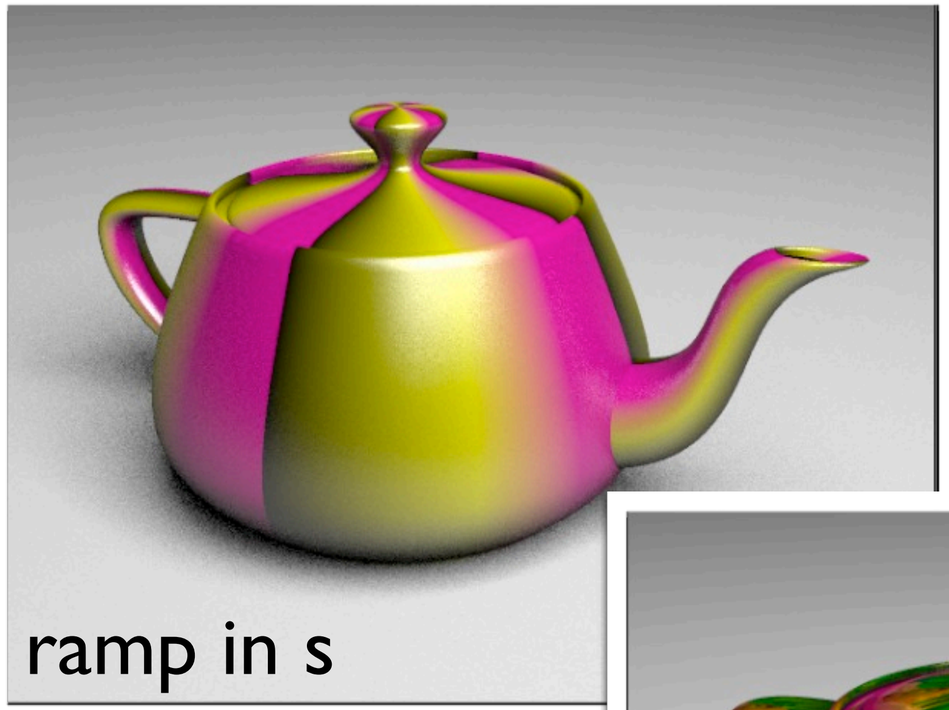
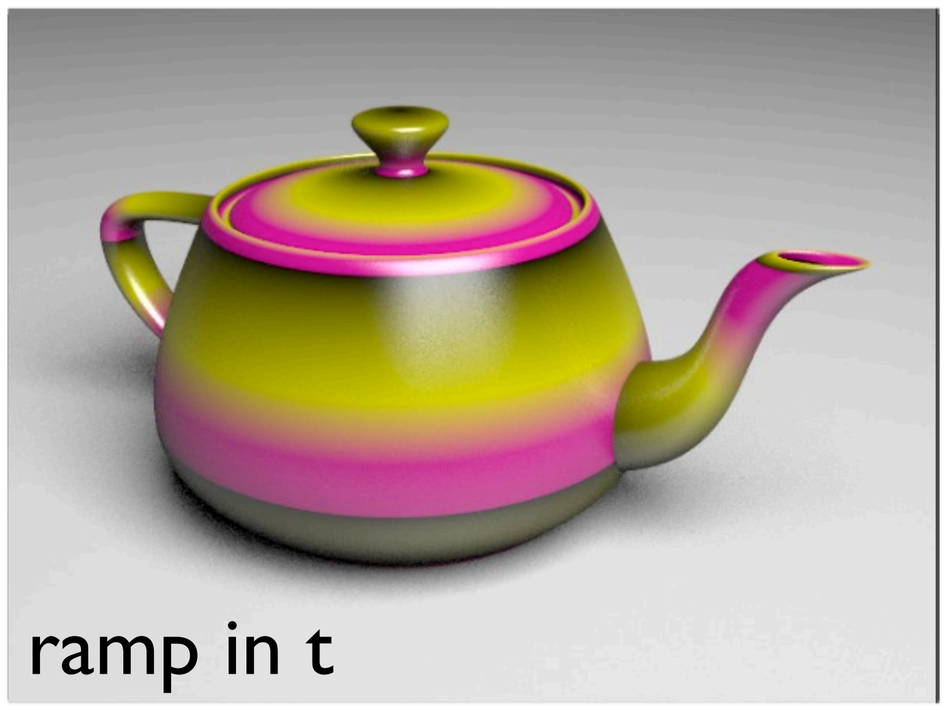
Testing Results



ramp in s



ramp in t

ramp in t with color map

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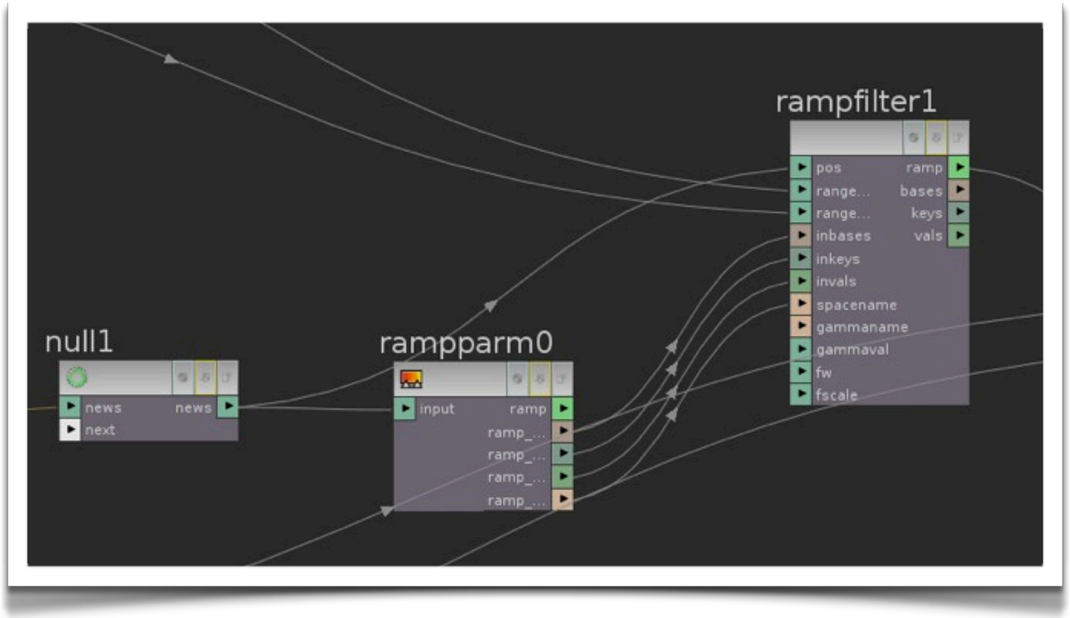
Adding a Null to make it more generic



- Added a null before the ramp parameter
  - This way I can bundle up the network from the null on to a digital asset and reuse

  - Example - Add a bricker before the null

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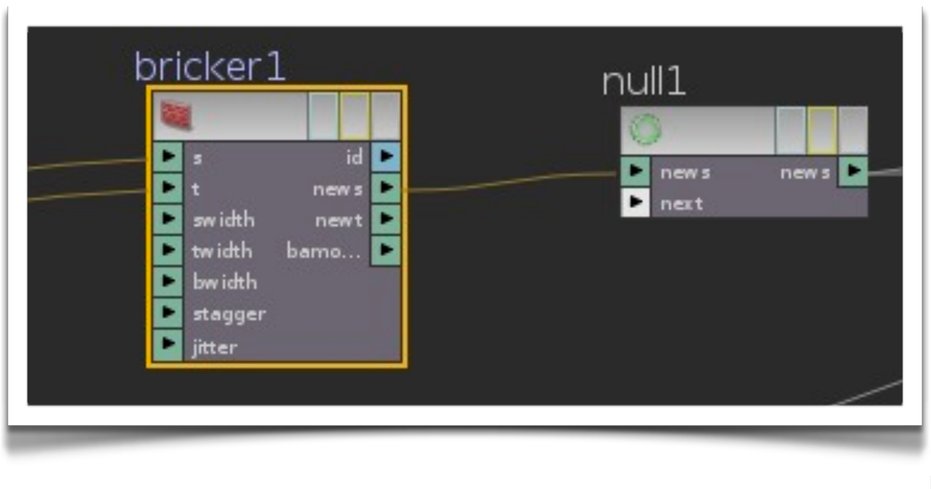
Wiring in the Bricker



- We now have a network that is easy generic and easy to modify.
- Let's make this into a Digital Asset

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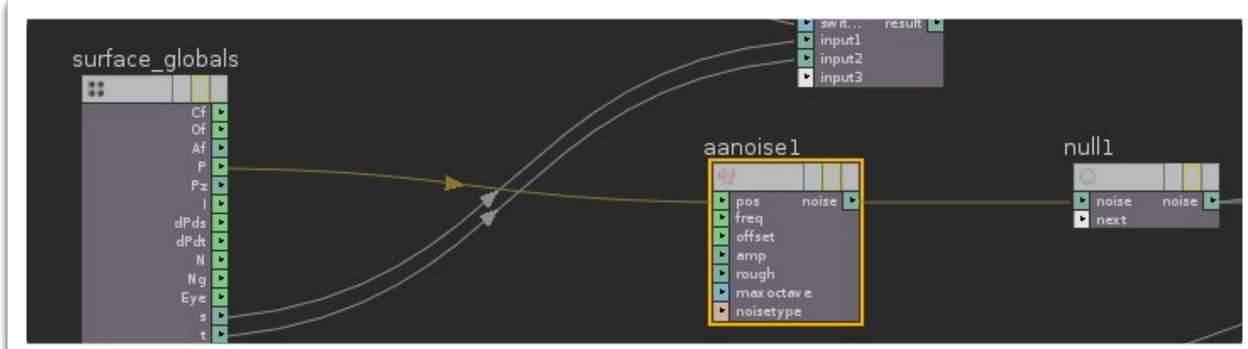
One more example

Anti-Aliased Noise...



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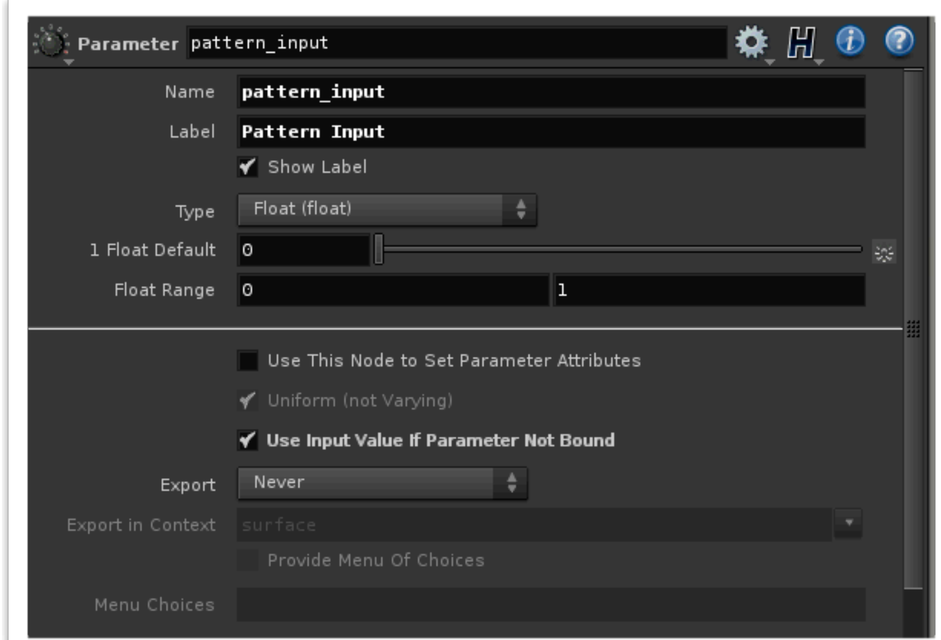
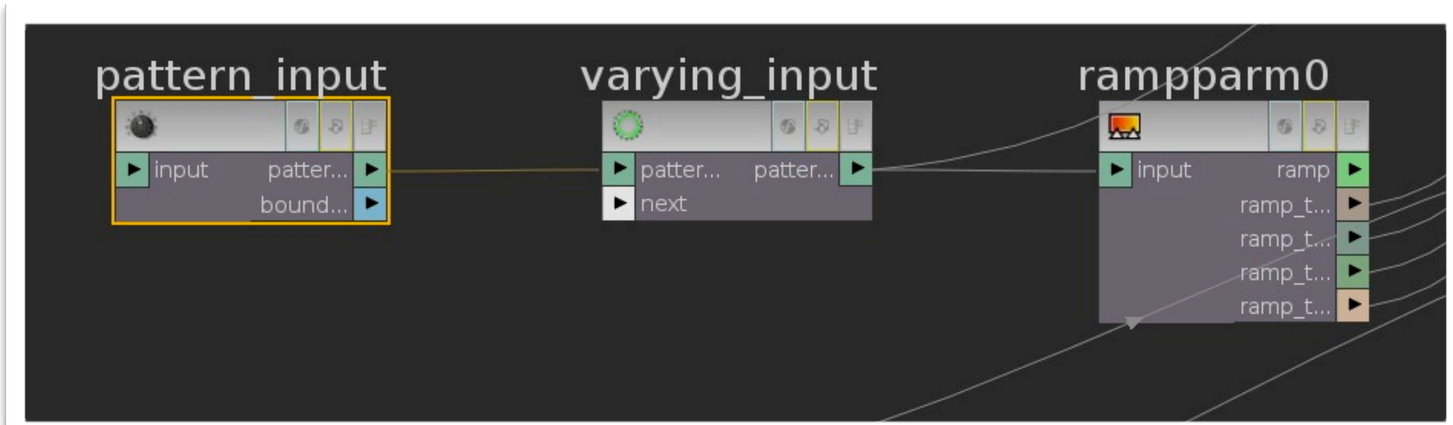
Time to Make the Digital Asset



- renamed the null to varying input
- added a parameter to the null called parameter_input
- In paramater input
  - selected “Use input Value if Parameter Not Bound”



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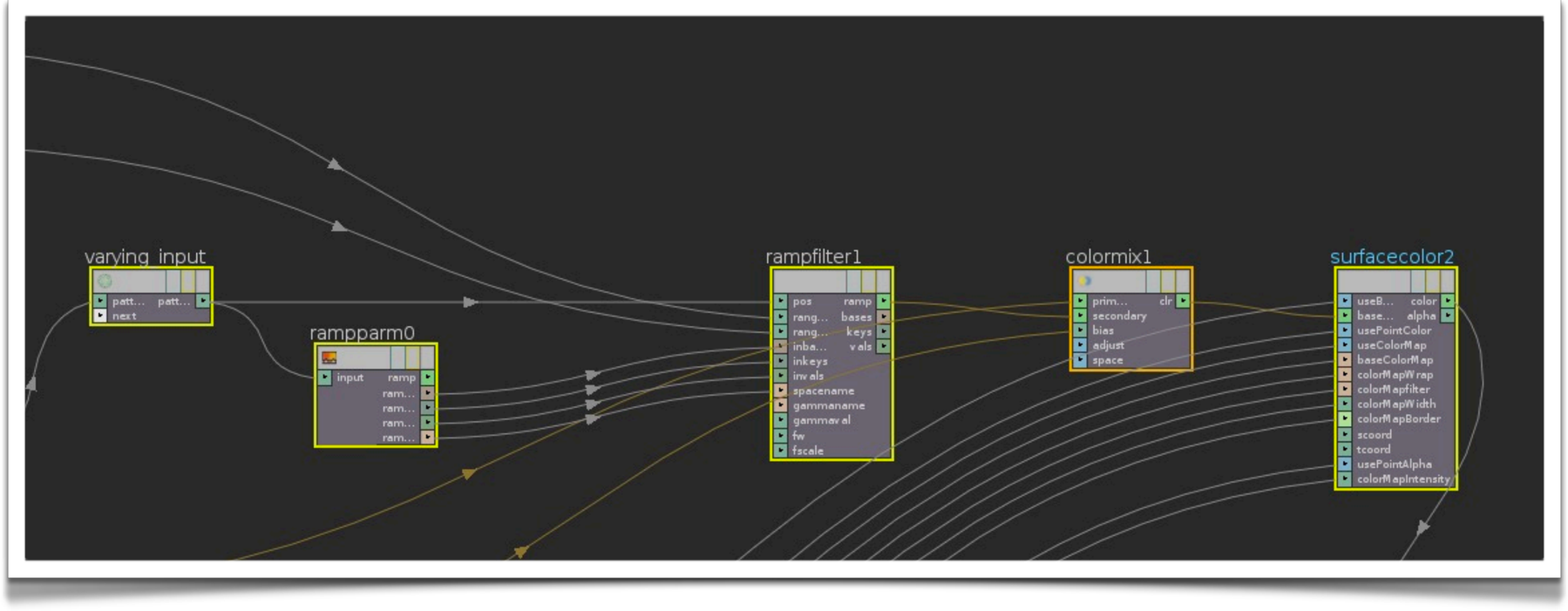
Which nodes to bundle into Asset?

- Do not include parameters into Asset!
- What happens if you do?
  - Answer on next slide



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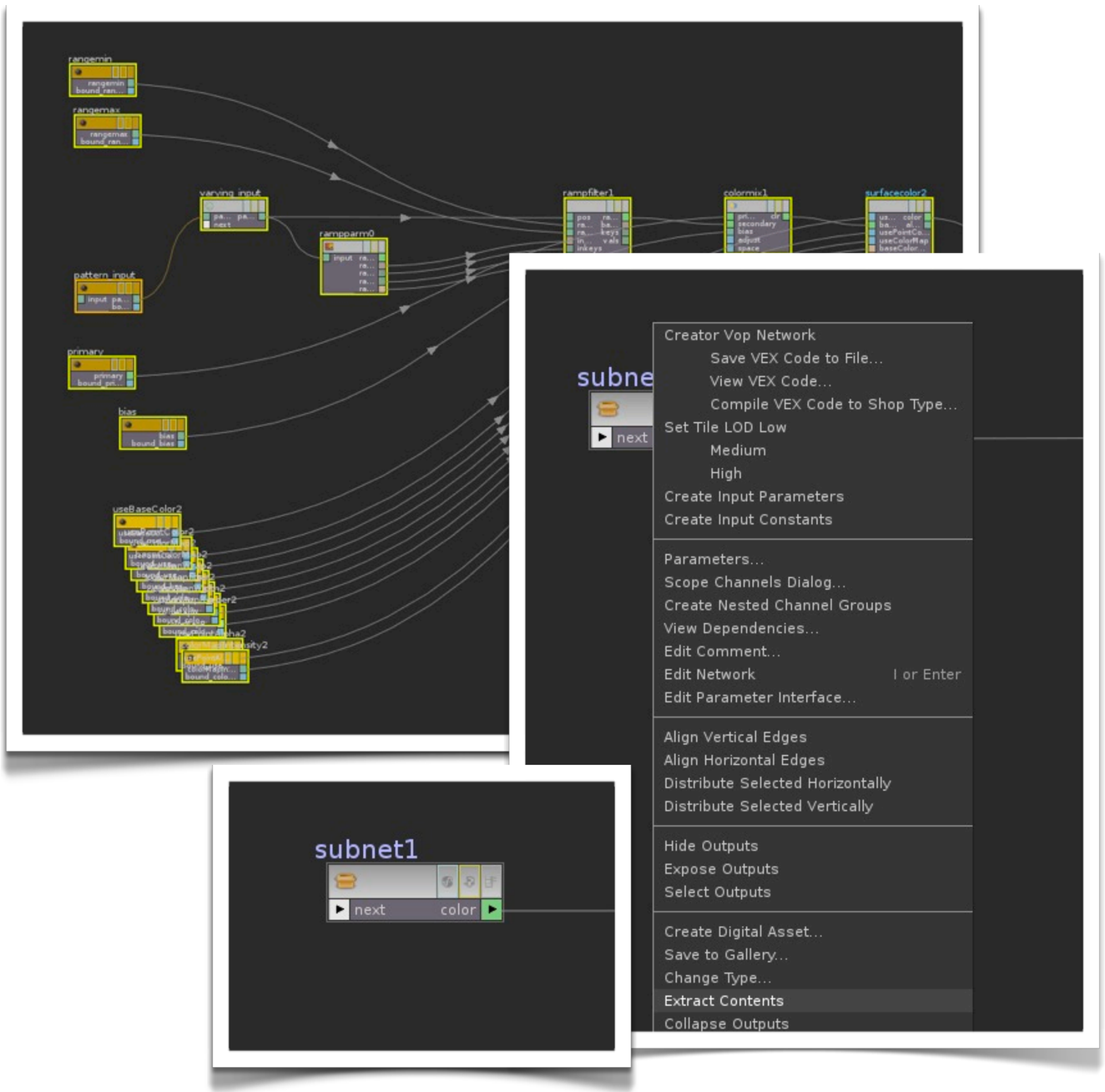
You get no interface



- Wrong way!
  - I selected the nodes of the network plus the parameters
  - Made the selected nodes into a sub-network (Shift-c)
  - The result is a sub-network without an interface
- To undo - Right click on sub-network
  - Select - Extract Contents

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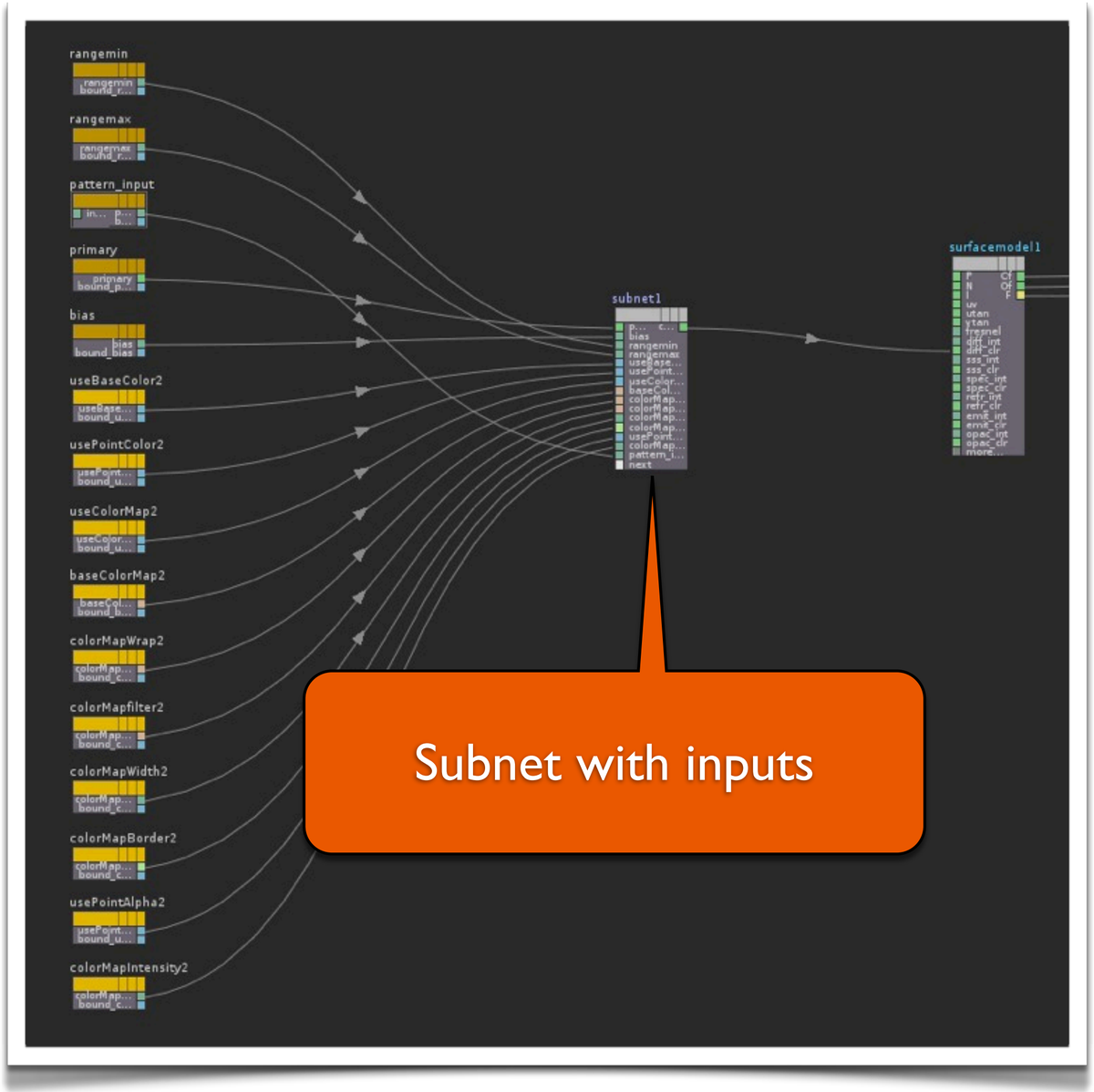
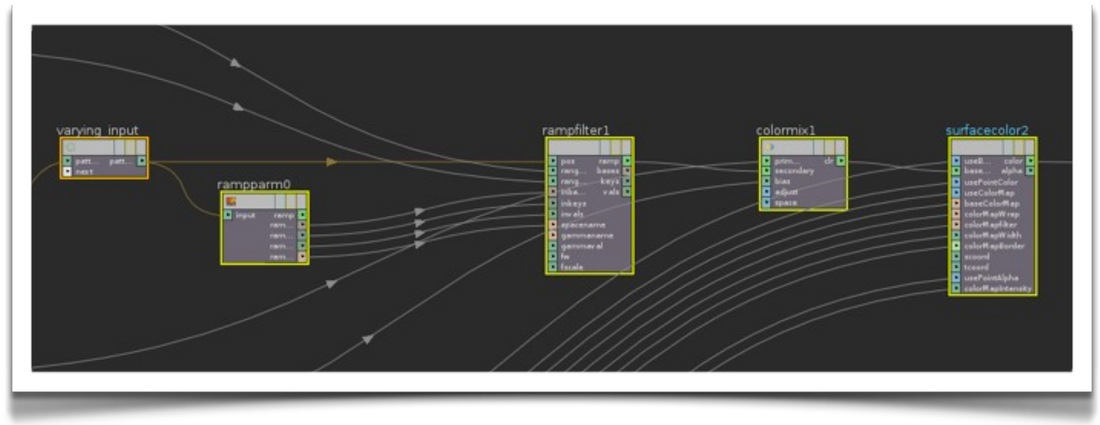
Sub-Network , The Right Way



- Only select the node you want inside the sub-network
  - Do not select the parameters
  - Create Sub Network
- Now you have inputs into your sub-network!



Nodes to select, then create sub-network

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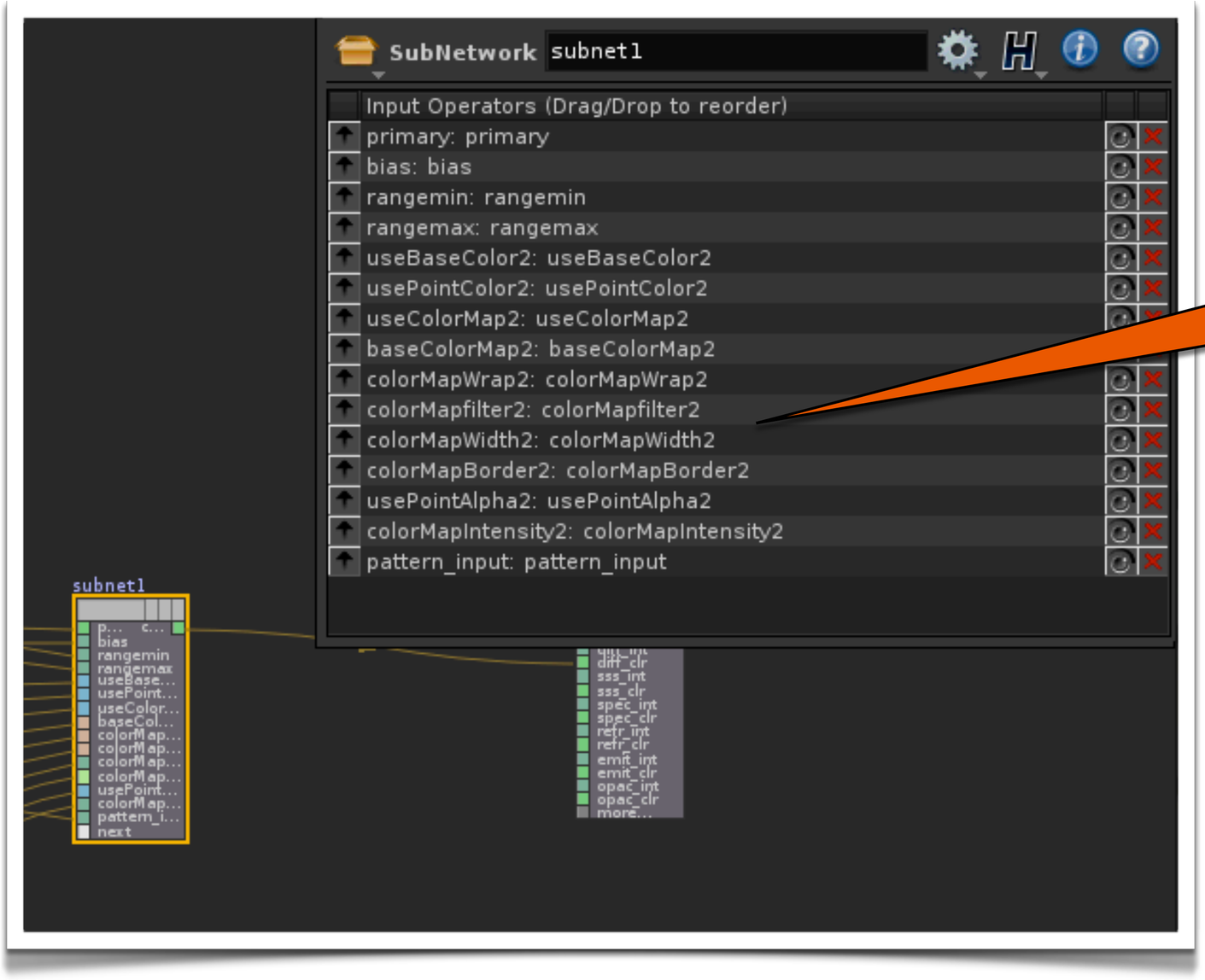
You can re-order the interface in any order



You can reorder the interface by clicking on the up arrow buttons

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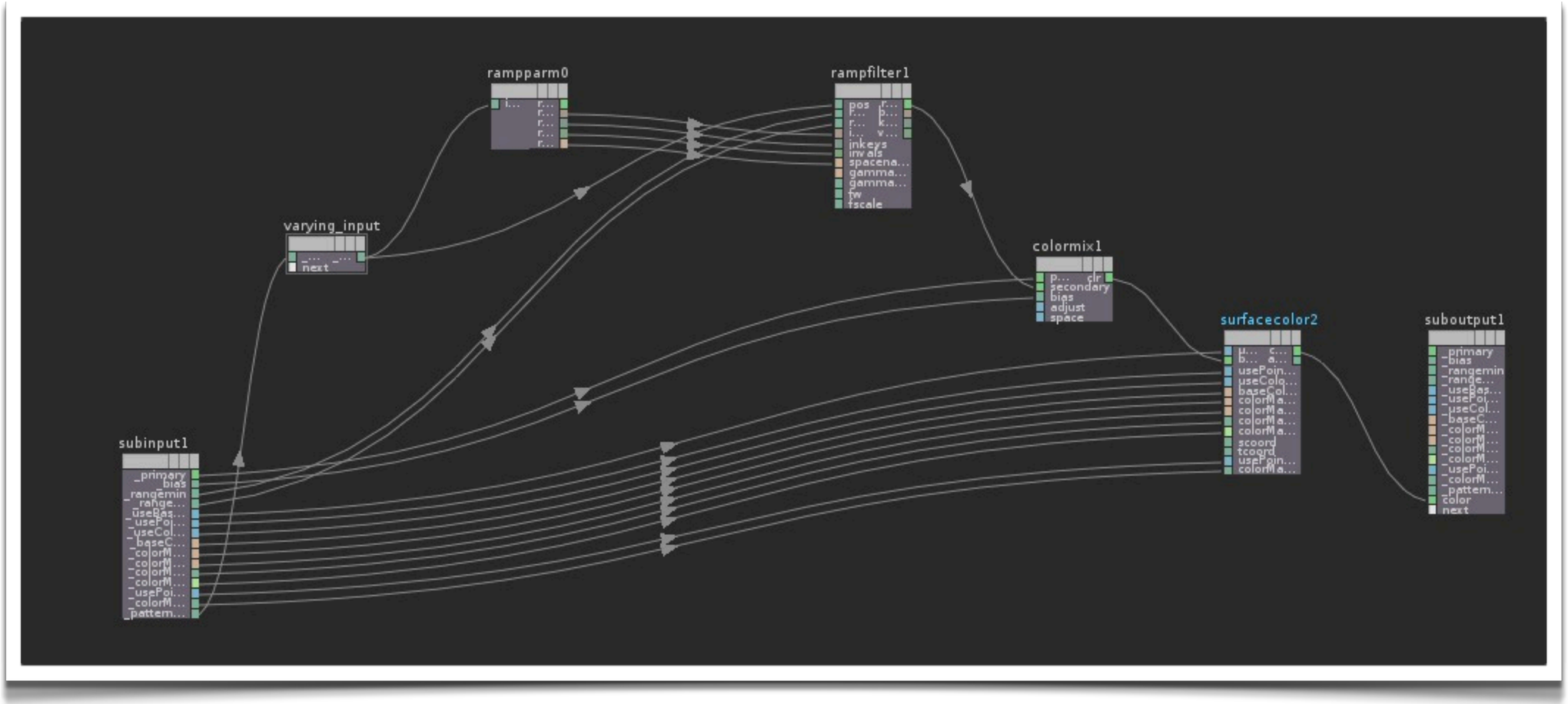
Time to Save Two Copies

- Save the original file before creating an asset
- Important if you ever want to modify the network and its parameters
- Save... RampEx.hip
- Save As... RampExDA.hip

Dive into Sub Network

- Clean Up if Necessary



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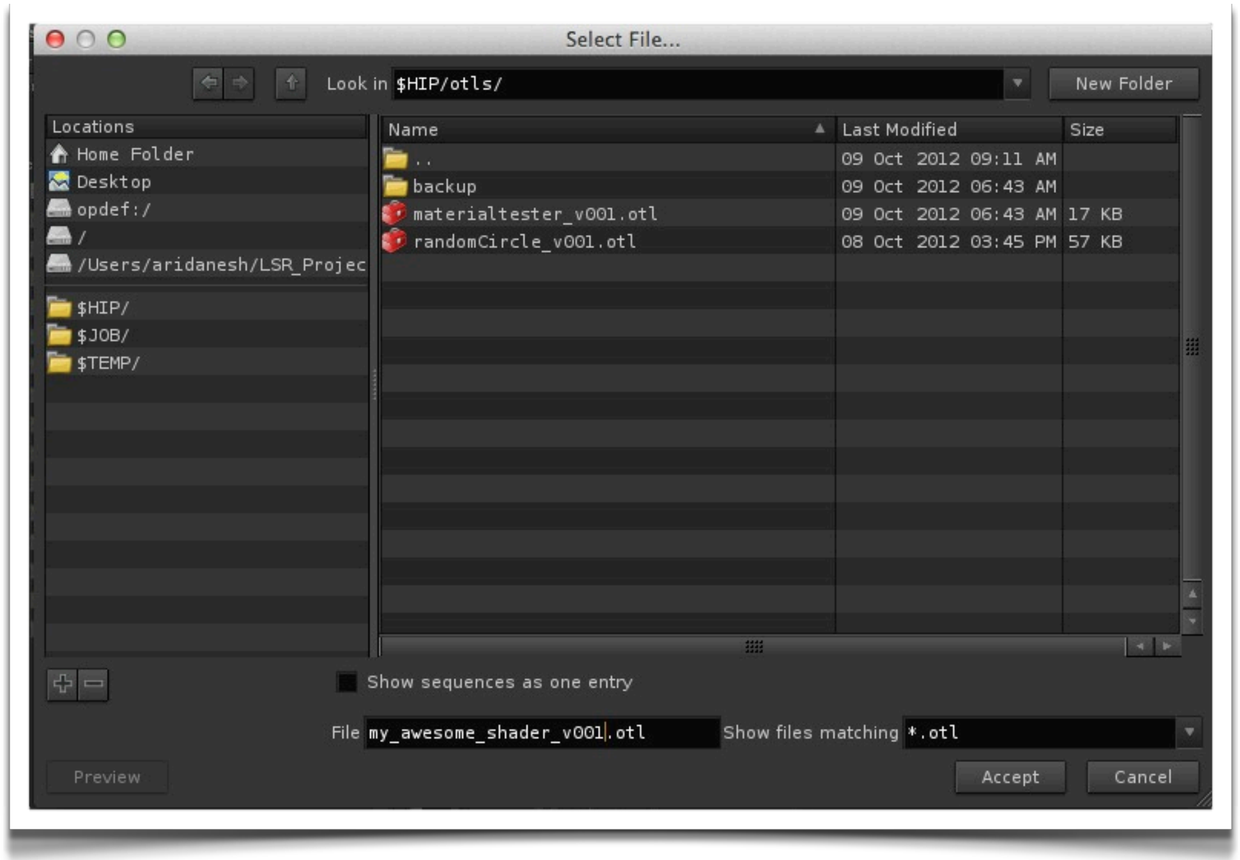
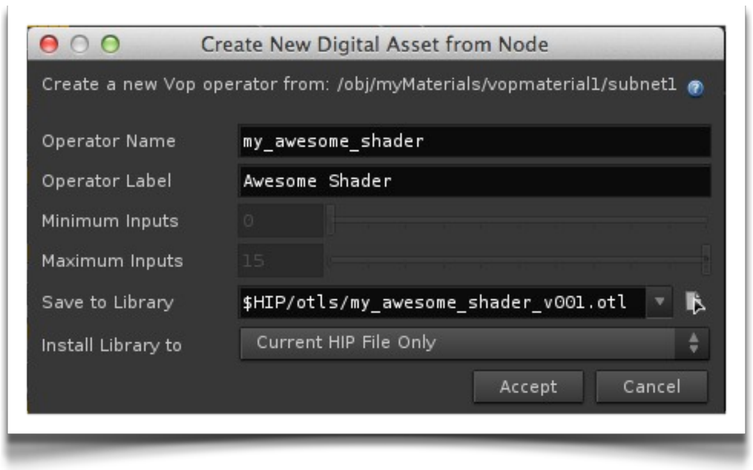
Create Digital Asset



- Jump back up to Sub_Network
- Right Click and select - Create Digital Asset
- Name it my_awesome_shader
- Save to otl folder



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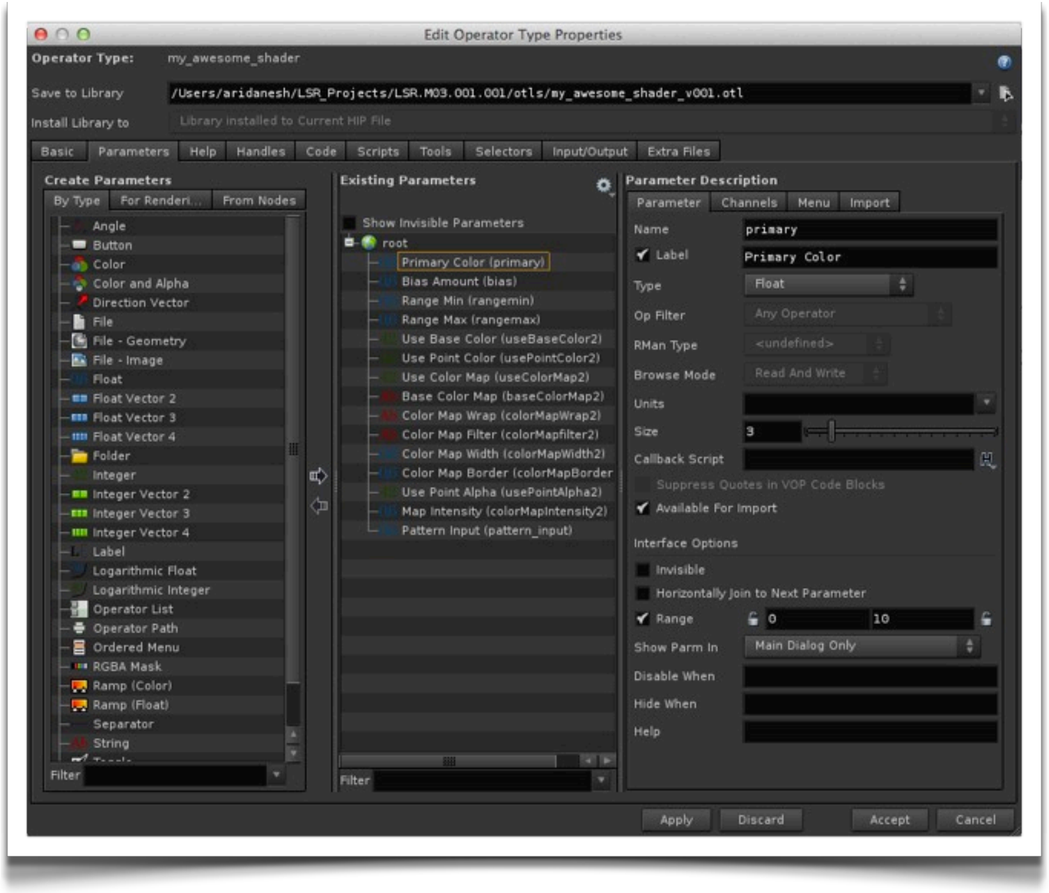
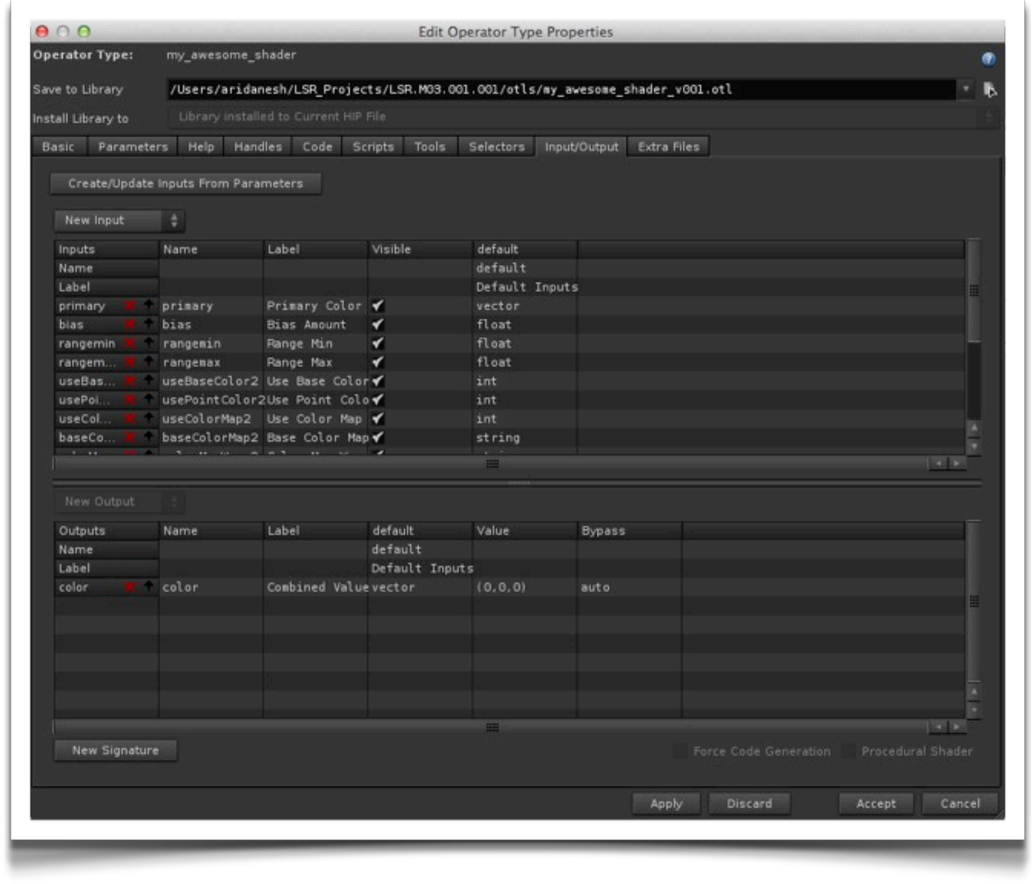
Notice ...

All your parameters and input/outputs have been created for you.





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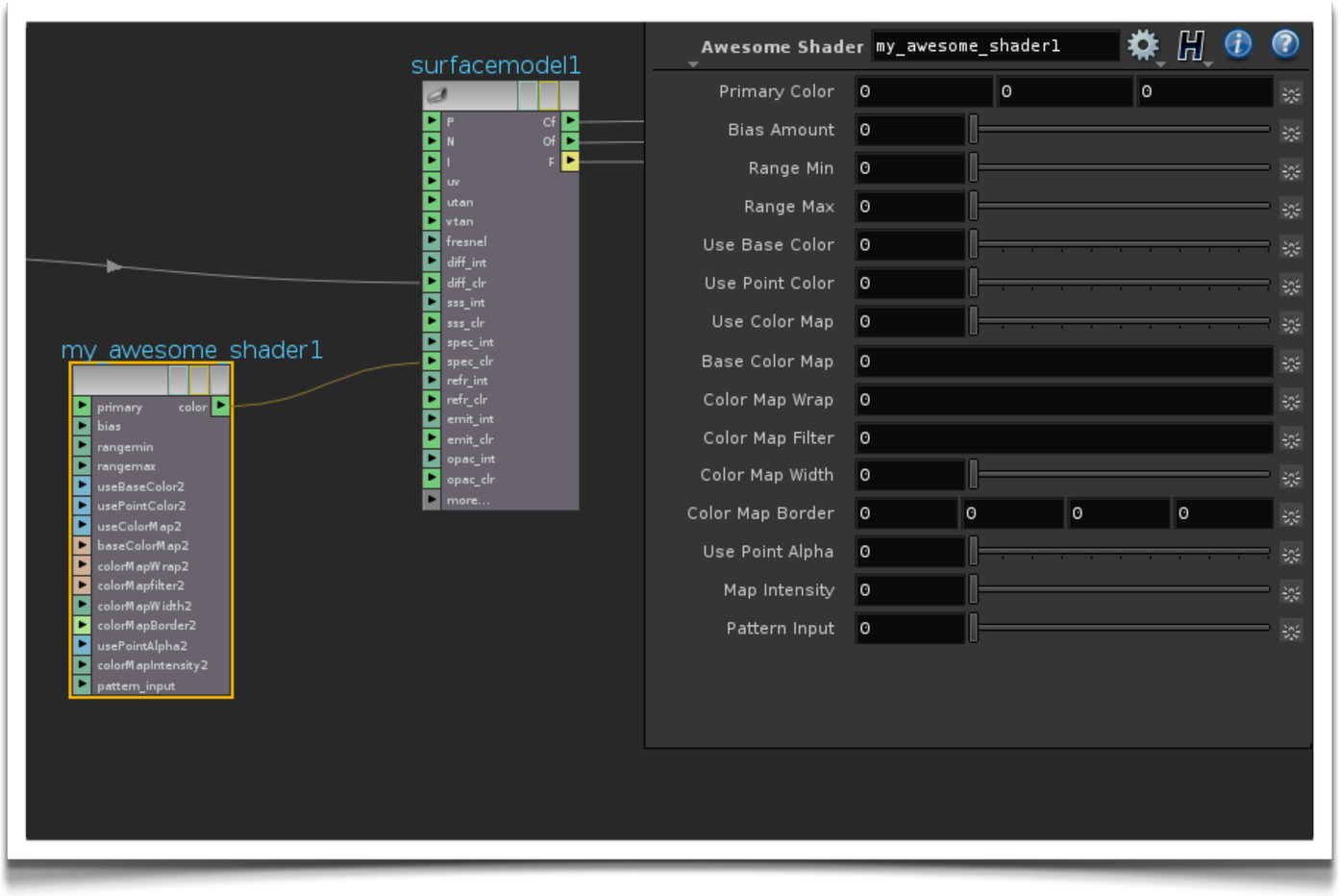
Drop down and use your new Digital Asset



- Plug it into Specular Color
  - Notice the interface has to be fixed :(
- Right Click on Asset
  - Allow Editing
- Right Click on Asset
  - Right CLick on Type Properties
- Fix Interface.

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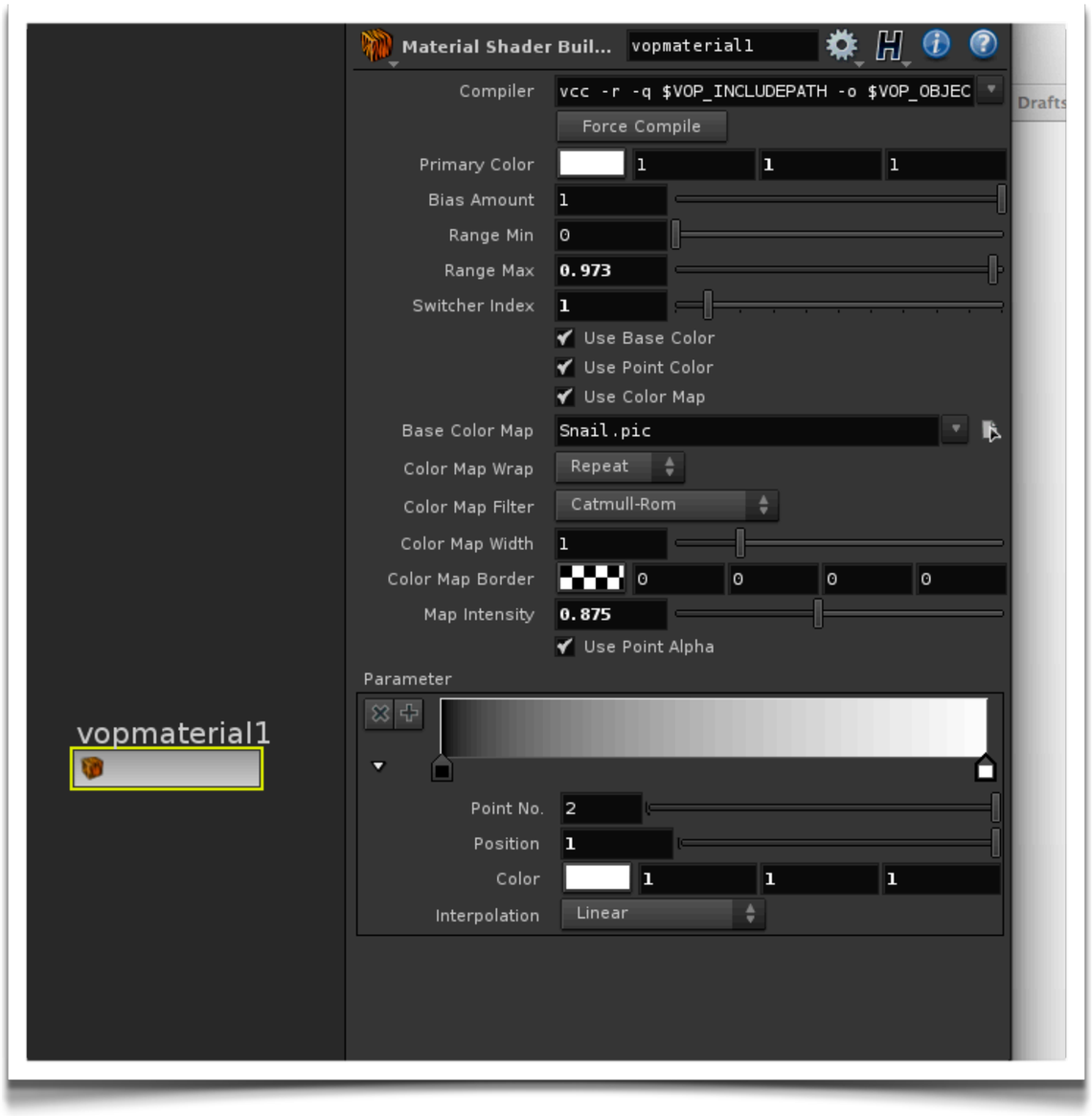
Looks better but...



- Where is the Second Ramp for Specular Color?
- There is a name conflict that is unique to Ramps (others give a compile warning)
- We have to hack a solution

- Let's test the theory
  - Go back into Asset
  - Change name of Ramp to specRamp for Spec input
- See at the shader level two ramps appear

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Two Ramps

- We need a better Solution

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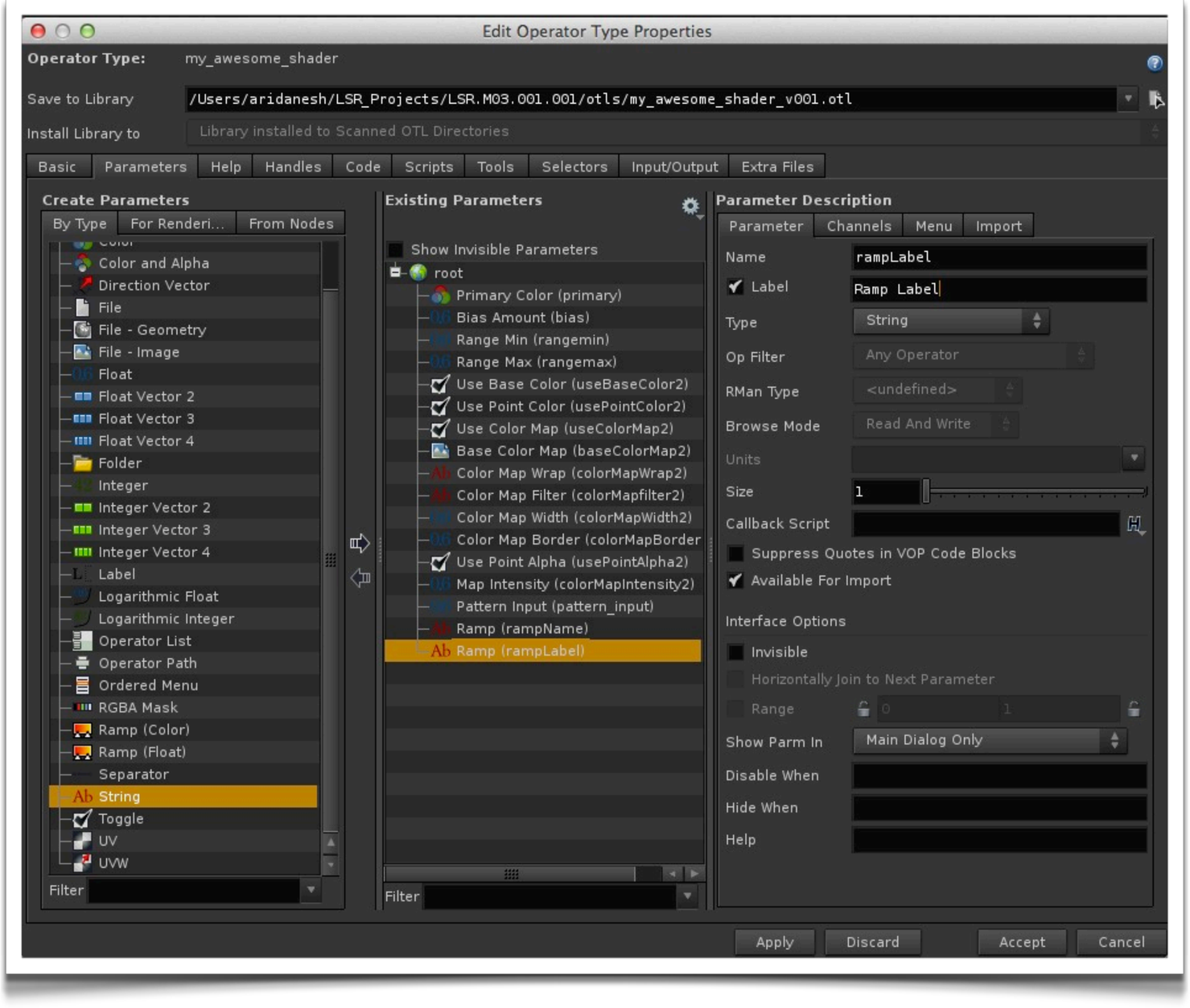
The proper way



- Add two strings
  - First one name rampName
  - Second one name rampLabel
- Channel value set to “ramp”
- Hit apply
- Dive into SubNetwork
  - In rampparm
    - Set name to `chs(“../rampName”)`
    - Set Label to `chs(“../rampLabel”)`
  - Go back Up and Re-compile
  - Test

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Texture vs Color Map

- Texture - This operator computes a filtered sample of the texture map specified and returns an RGB or RGBA color. If the image does not have an alpha channel (e.g. a JPEG image) and the operator returns RGBA, the alpha will be set to 1.
- Color Map - This operator looks up a single sample of RGB or RGBA color from a disk image. If the image does not have an alpha channel associated with it (e.g. a JPEG image) and the operator returns RGBA, the alpha component will be set to 1.

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