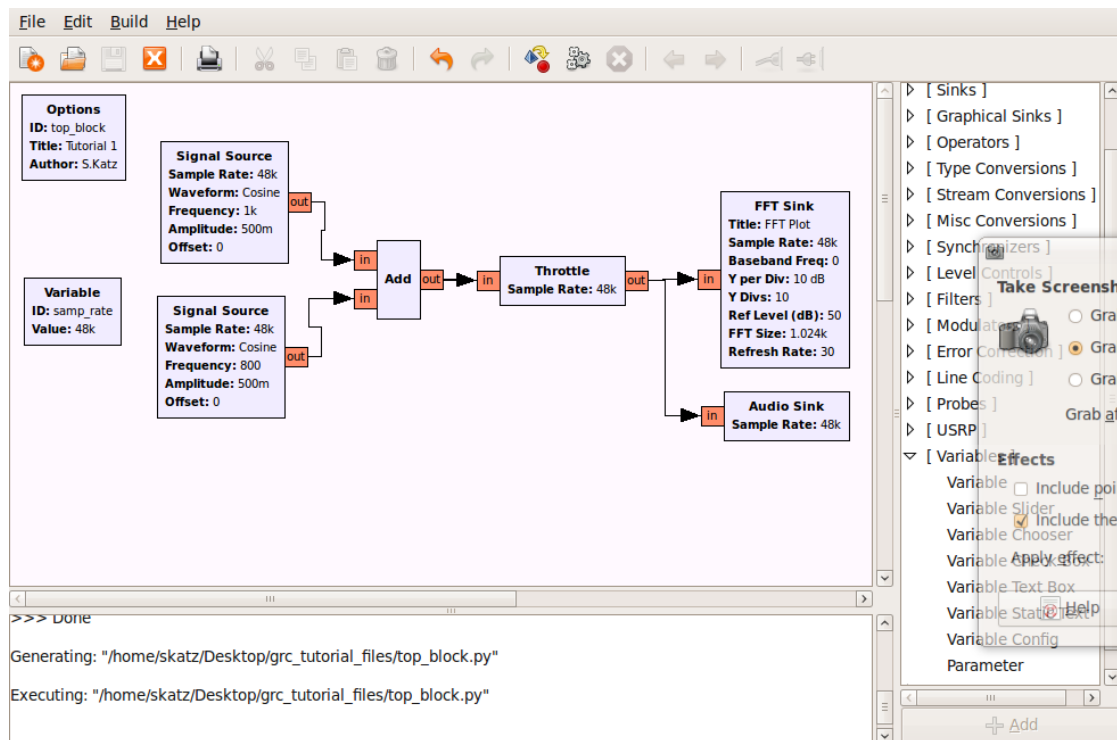# Using GNU Radio Companion: Tutorial 2

This tutorial illustrates some of the features available in GNU Radio Companion such as sliders and other variable input options.

1. Open a terminal window using: Applications > Accessories > Terminal. At the prompt type:

    `grc`

    Construct the flow graph shown below. Note that the sample rate is set to 48000 in this example.

2. Execute the flow graph. You should hear the composite tone and see the FFT sink display of the spectrum. Experiment with the FFT size in the FFT sink. It must always be a multiple of two. Note that as you increase the FFT size the resolution of the display increases. Reset the FFT size to 1024 when you are done.

3. Add a Variable Slider (from the Variables category) to the flow graph. Double click on the block and set the parameters as shown below.
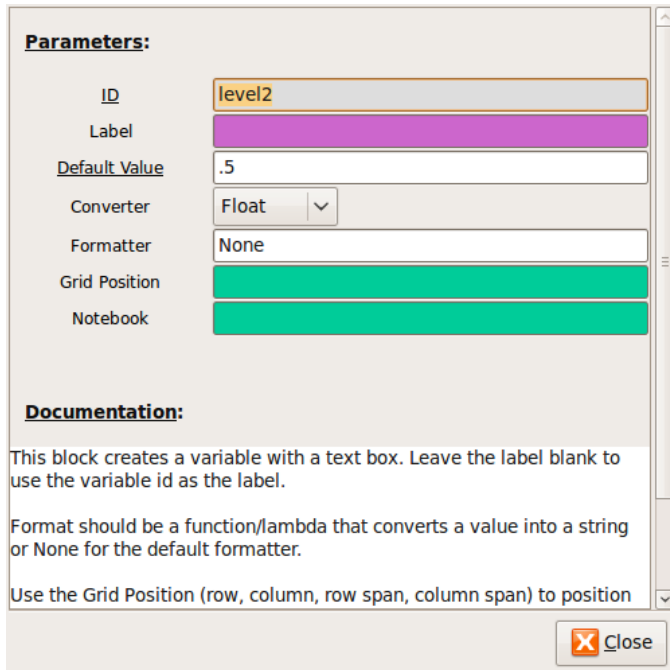
Parameters:

ID	freq2
Label	
Default Value	800
Minimum	10
Maximum	2000
Num Steps	100
Style	Horizontal ∨
Converter	Float ∨
Grid Position	
Notebook	

Documentation:

This block creates a variable with a slider. Leave the label blank to use the variable id as the label. The value must be a real number. The value

❌ Close

4. Execute the flow graph. This time when the FFT sink display opens you will see a horizontal slider at the top. Move the slider back and forth to change the value of freq2 between 10 and 2000. You should observe that this does not change the spectrum or the sound. This is because freq2 has not been assigned to control anything.

5. Double click on the bottom Signal Source (set to 800). Replace the frequency (800) with the variable freq2. Execute the flow graph. You should now observe that both the spectrum and the sound change as you vary the frequency of the Signal Source using the slider.

6. Add a Variable Text Box to the flow graph. Set the parameters as shown in the figure below.

Parameters:

ID	level2
Label	
Default Value	.5
Converter	Float ▾
Formatter	None
Grid Position	
Notebook	

Documentation:

This block creates a variable with a text box. Leave the label blank to use the variable id as the label.

Format should be a function/lambda that converts a value into a string or None for the default formatter.

Use the Grid Position (row, column, row span, column span) to position

❌ Close

7. Double click on the bottom Signal Source and replace the Amplitude (.5) with the variable, level2. Execute the flow graph. Note that a text box will not appear in the display. The default value of 0.5 will be entered. Change the value to 0.1 followed by Enter. The volume of the 800 Hz tone will decrease and this will be reflected on the spectrum plot. Do not vary the level above one.

8. Add a Variable Chooser block to the flow graph. This block will add either a drop down menu, radio buttons or a button. Input the parameters as shown in the figure below.

Parameters:

ID	freq1
Label	
Default Value	1000
Choices	[500, 1000, 1500]
Labels	[]
Type	Radio Buttons ∨
Style	Horizontal ∨
Grid Position	
Notebook	

Documentation:

This block creates a variable with a drop down, radio buttons, or a button. Leave the label blank to use the variable id as the label. The value index is the index of a particular choice, which defines the default choice when the flow graph starts. The choices must be a list of

❌ Close

9. Change the Frequency of the top Signal Source (1KHz) to freq1. Execute the flow graph and change the frequency of the top Signal Source using the radio buttons. Experiment with the Drop Down menu and the Button to see how they work.