# ScottEffx
Music Light Show Simulator

Simulation is a necessary part of designing a music light show. Using a photograph of your prospective scene, be it a stage, house, parade, or even a yacht (as in many of our light show videos), you add LED 'Lights' by simply drawing them on to the scene. The music light show composition can be done without buying anything, using the free ScottEffx App for the Macintosh and a free online graphical editor such at GIMP (GNU Image Manipulator Program). Each graphical layer of 'lights' is saved with an index in its name indicating to which MIDI Map channel it 'subscribes'. For more information on MIDI Map channels and their function see the tutorial **MIDI Map and Effects Save / Load file**. For the simulation, the base image of the scene is overlaid with the graphical layers, containing the 'LED String Lights', with the layers varied in brightness according to the music light show effects.

To see a simulation in action, see our website videos, some of which are simulations. The simulation updates at 60Hz to accommodate Macintosh screen update rates, while actual light shows run 3.5X faster with a 210Hz update rate.

Music light show simulation using GIMP

Here we describe how to use GIMP to create and decorate a scene which can be used by the **ScottEffx App**.

The GNU Image Manipulation Program (GIMP) can be downloaded for your computer or laptop at ***https://www.gimp.org*** . When it is started you get a screen like this:
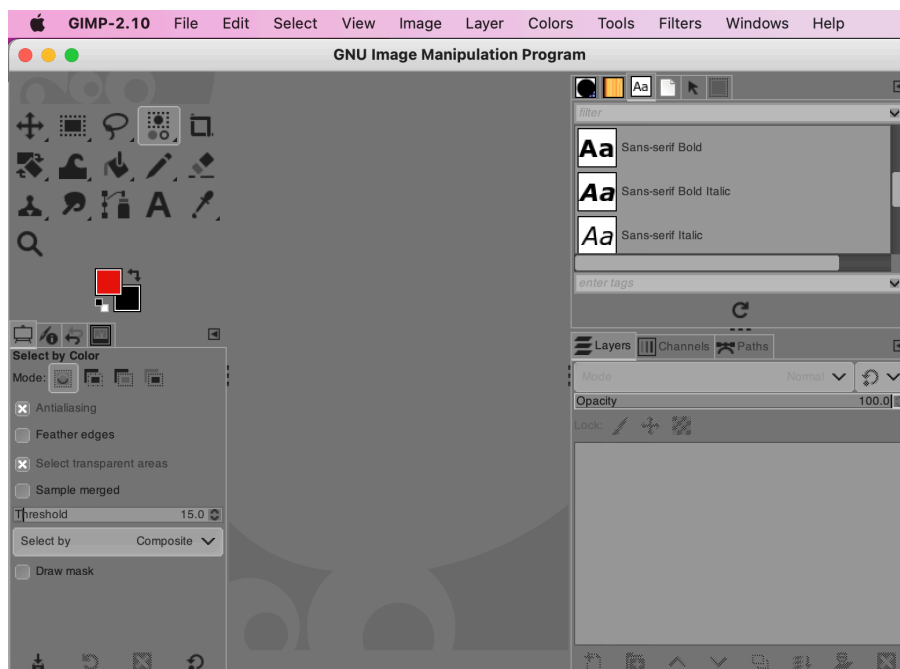
Use **file->open** to navigate to a photograph or image used as your background. In this case I use an image of an old mansion to decorate for a Halloween light show. You want to have enough resolution to adequately represent the scene, but not so large to slow down the simulation when it renders the overlapped images. Adjust the image pixel count using **Image->Scale Image** from the menu bar. In this case we kept the image width to 1000 pixels.

Next we want to draw LED lights into the photograph, and for that it's useful to download our GIMP brushes which look like individual LED lights. From our website, download the brushes which come in individual colors or multicolored versions and copy them to the default GIMP brushes folder which can be found on your Macintosh at:

Macintosh HD/Applications/GIMP-2.10.app/Contents/Resources/share->gimp/2.0/brushes/

Alternatively you can just use one of the standard 'Brushes' which can be seen in a dockable dialog box presented by selecting in the top menu bar

Windows->Dockable Dialogs->Brushes, then edit the brush **Size** and **Spacing** once you have selected the **Brush** icon

Once you have copied in the brushes, they will show up in the right side of the GIMP Window, and be available for selection and use by the **Paintbrush Tool**, shown selected on the upper left side of the image below.
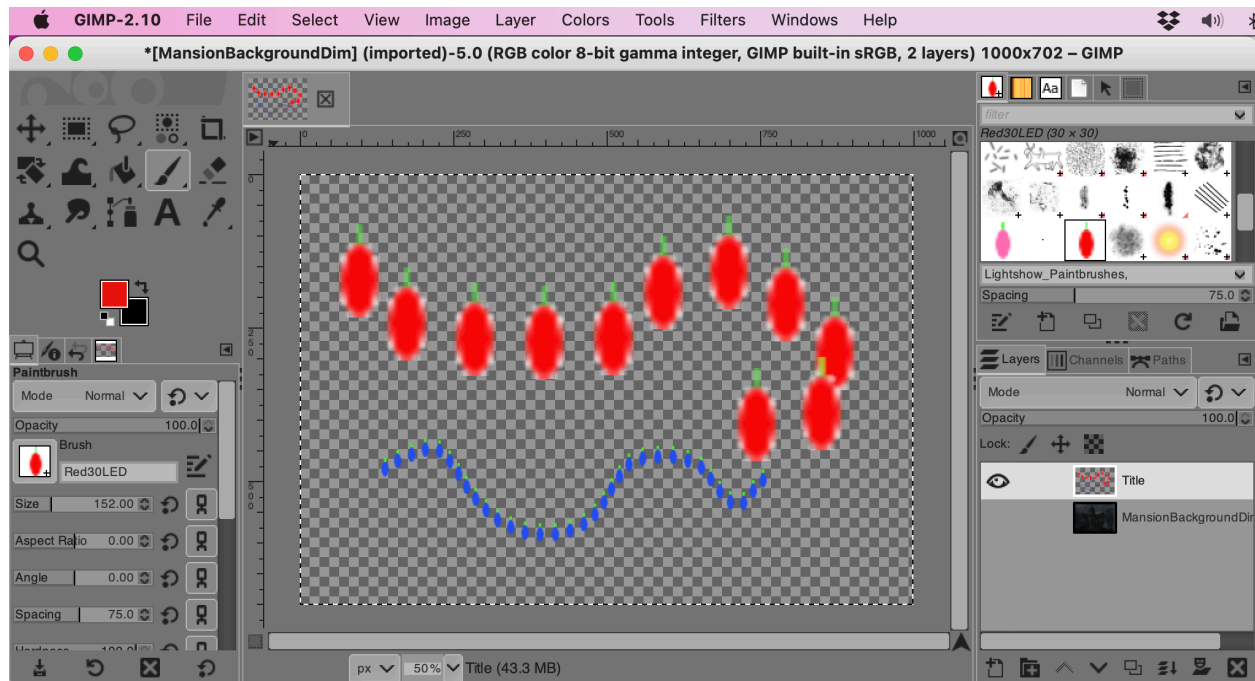
With the Halloween mansion image turned off (**eyeball** on the lower right clicked 'off'), the **Paintbrush Tool** can be dragged around the screen, depositing copies of the LED's just like painting a squiggle or line. Two different **Size** and **Spacing** examples are shown here. Clicking in the **eyeball** column next to the Mansion image will then show the Mansion decorated with lights. Note that the layer with the lights must be above the background image (Mansion in this case) in the **Layer** list in the lower right corner, for the lights to be visible. **Be Sure** to have the correct layer selected, the one in which you want to 'paint' LED lights, before drawing with the **Paintbrush Tool**, otherwise the LED's will be painted into the background image directly, and will not be controlled in your simulation. To create a new layer, right click in the layer list or else use the menu bar **Layer->New Layer** selection with the name you want, 100% opacity, and 'fill with transparency' selections. You want a new layer for each independent string light for your light show.
In the above image the checkerboard pattern is representative of a transparent background -> no background color.
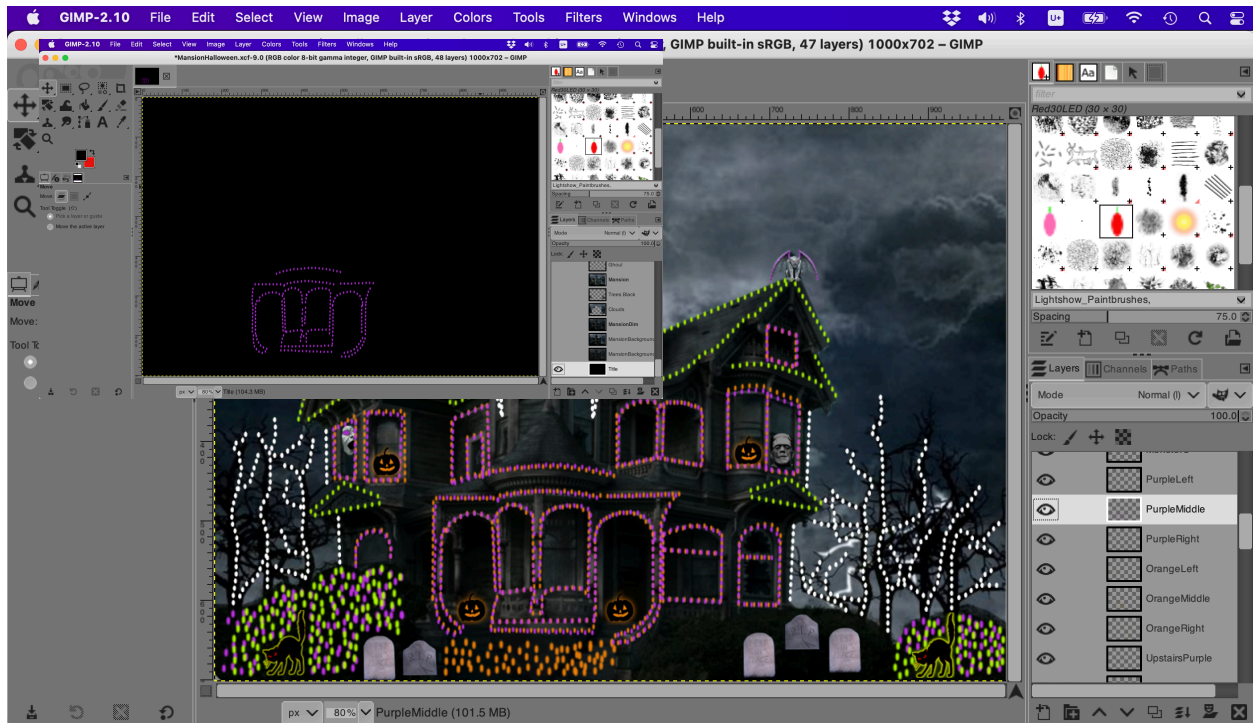
Here is the mansion fully decorated with different colored lights. Each light string has its own layer shown on the right, overlaying the background Mansion picture. For example, the lower middle purple light strings all by themselves are shown in the inset image.

For simulation, each layer must be exported to a **.png** file which supports transparency as opposed to a fixed color background. JPEG files will not work. Select only the layer of light(s) you want for a distinct MIDI Map channel, then export by doing **file->Export As**, then give it a file name ending in **.png** or else selecting **PNG Image** in the drop-down menu. Whatever name you assign to the saved **.png**, the last 3 characters of your filename **MUST BE** a number between 0 and 255 which in the simulation will interpret as the MIDI Map channel which controls the lights (eg. the layer brightness). When you are done, you should have a directory of **.png** images like this: (note: the leading numbers are not necessary, but are handy for ordering the images)

Simulation on the ScottEffx Macintosh App

The **ScottEffx** simulation opens a window filled with the background image of your choice, and turns on the string light layer brightness as composed by you in your DAW. To run a simulation you need the following:

- Macintosh
- A compatible DAW such as Logic Pro X set up as detailed in the tutorial "***flickerSong Compose***"
- A MIDI keyboard connected to your Macintosh. Alternatively you can use your DAW's built-in keyboard using the Macintosh keyboard
- Filled-out MIDI Maps in the Macintosh App for all the Midi Map channels which have lights (layer files)
- Effects for all the Effect selections in your MIDI Maps.

See the tutorial **Scotteffx: Midi Map and Effects Save / Load File** for more information on how to create MIDI Maps and Effects.

In the **App**, select the **Compose** symbol which will bring up the Compose page.
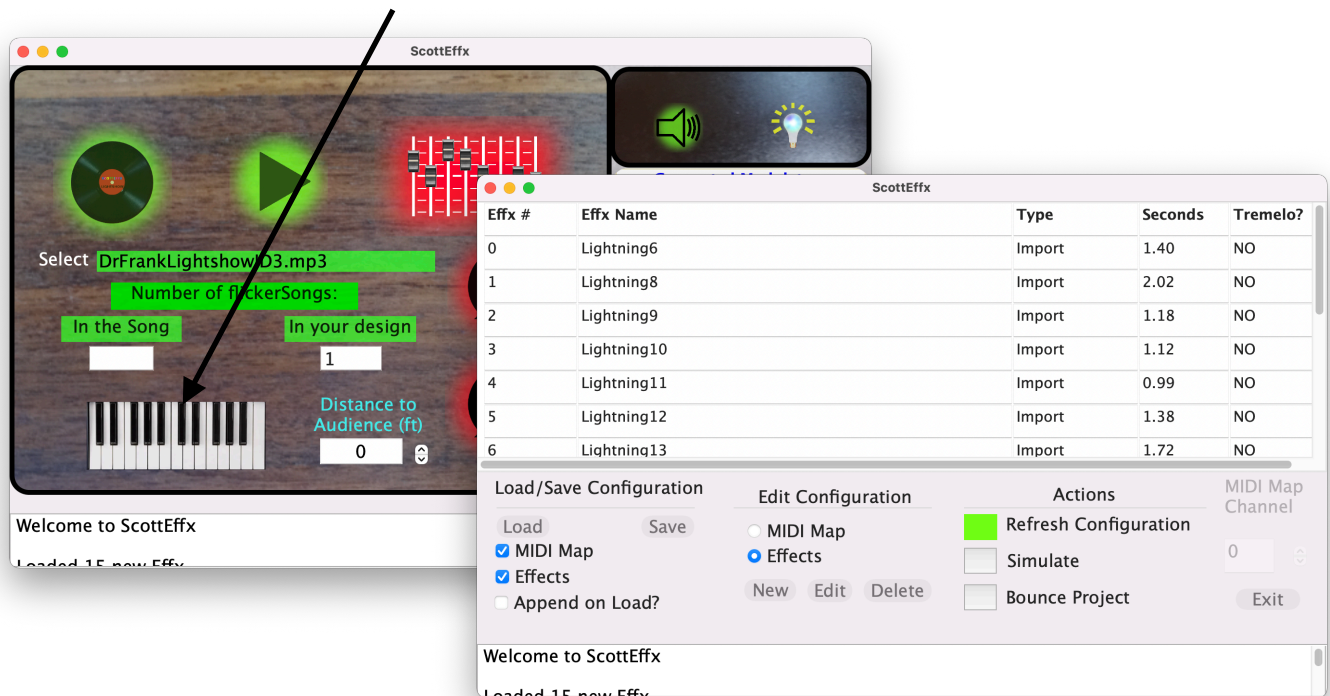
Then press the **Simulate** button to get a standard Macintosh dialog for opening a file.
Select your background file (in this example it is **MansionBackgroundDim.png**).
The **App** will then find all the layer images in the same directory which have a 3 digit number at the end of their name, and load them for playing a light show simulation.

After pressing the **Simulate** button and selecting the background file, the **ScottEffx App** will open a new window containing the background image overlaid with all the string light layers, but with those layers brightness set to zero. The **App** is now ready to respond to MIDI Note-On events issued from your DAW, which can come from your music keyboard (while on a properly set-up track), highlighting a note with your pointer, or playing the composition. Again, see the **flickerSong - Compose** tutorial for more information on composing a light show.

If you have **flickerSongs** running and connected to the **ScottEffx App**, they will also respond by playing the Light Effects according to how each of their 8 outputs are assigned to a particular Midi Map channel. In addition, after setting up the simulation window, you can go back to the main **App** window, and load and play an existing MP3 music light show in your simulation window and on any connected **flickerSongs** simultaneously.

Conclusion

In this tutorial we briefly demonstrated how to simulate your light show composition using the **ScottEffx App's Simulate** capability on a Macintosh. Using simulation is a powerful tool for creating and editing a light show for the scene of your choice, well before you set-up and decorate the actual scene.