LIGHT-O-RAMA MUSICAL SEQUENCING
by Marty Slack of Christmas Utah

Disclaimer: There are several ways to create musical sequences using Light-O-Rama software. I do not claim to have the only method, or even the best method. The following method works well for me and is based on my experiences using Light-O-Rama software since it was very first released.

1. **MUSIC**
   a. Music With Emotion (Types of Music)
      i. There are many different types and styles of music. Music with a strong beat, and emotional or dynamic changes, works best with a synchronized display.
   b. Feel The Beat (basic music theory)
      i. In order to create a quality synchronized show you need to find the underlying beat of the music. Many people tend to tap their feet or bob their heads while a song is playing. This tapping or bobbing is usually a constant, steady beat. This is not the rhythm of the melody or words in the song. It is a steady beat that drives through the entire song.
      ii. As you tap your feet you will find that the taps fall into logical repeating sets of beats.
         1. Musicians know these sets as "measures."
         2. Four-beat sets or four beats per measure (1-2-3-4-1-2-3-4-1-2-3-4…) This is known as 4/4 time.
         3. Three-beat sets or three beats per measure (1-2-3-1-2-3-1-2-3…) This is known as 3/4 time.
         4. There are several other measure timings but the most common are 4 beats per measure (bpm), 3 bpm, and 6 bpm.
      iii. The rhythms or notes in a song often fall between these underlying beats. The beat is easily subdivided, and all notes or rhythms fall exactly on these subdivisions.
   c. Layering
      i. The musical layers of a song are groups of rhythms that when blended together make the complete song.
      ii. Each layer is often tied to a specific voice or group of instruments.
         1. The first layer is usually the melody, or the notes the lead singer follows.
         2. Other layers could be the harmonies, or the notes that instruments or other singers are using. The rhythm of these layers is different than the rhythm of the melody.
         3. The percussion or drumbeats are usually very prominent, and can be a layer of their own.
      iii. By incorporating and blending these different layers into your sequence you will have an interesting, appealing light show.

2. ENTERING TIMINGS

   a. The Tapper Wizard

      i. When creating a sequence the first thing I do is enter the basic beat using the Tapper Wizard. I do not try to tap out the rhythm of the melody. I tap out the constant, steady beat of the song from start to finish. This steady tapping is sometimes the basic beat, but is more often the subdivided beat. The Tapper works great for this.
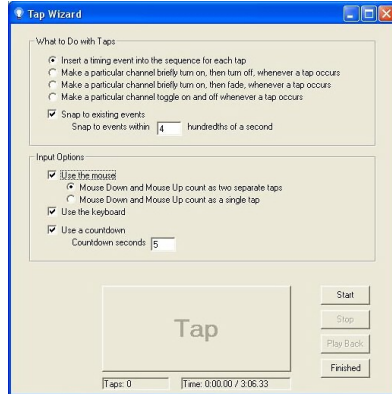
   b. Straight Grid

      i. Some people prefer to use a timing grid with each event set at a specific length. After they have their grid set they will then go in and fill in the events. The problem I have found with this method is the events tend to be slightly off from the actual beats of the music. For the most effective sequence, you want your timing to be as close as possible to the actual beats in the music.
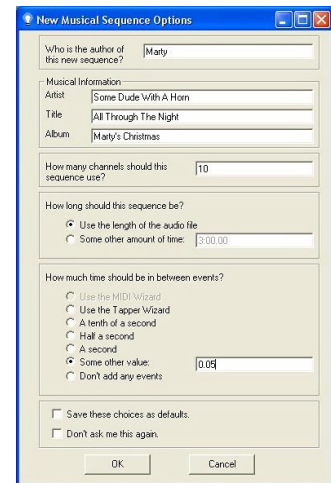
   c. Manual Entry

      i. Another method is to manually add events as you watch the timing line move across the screen. I use this method to add events that fall between the basic beat that I entered with the Tapper Wizard.

      ii. The Sound Wave Generator is a fantastic tool for lining up events that fall between the basic beats. It is also helpful when synchronizing to narration.
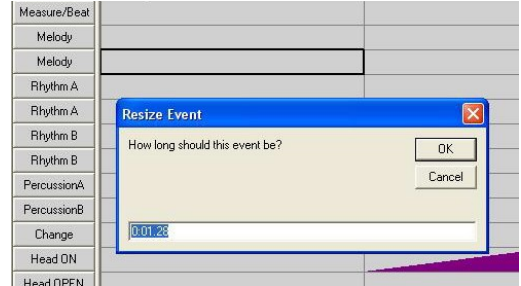
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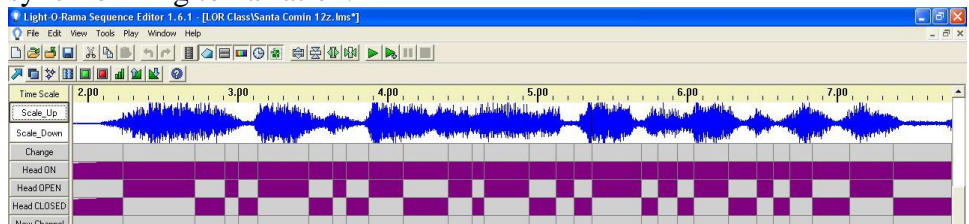
3. **THE BASIC BEAT**
   a. Adjusting First and Last Events (for exact synchronization)
      i. After I have my basic beats entered into the sequence I will make adjustments so they line up perfectly.
         1. The Tapper almost always will enter the events slightly behind where the beat really is. This is easy to fix by shortening the time of the very first event so the remaining events line up correctly. Adjust this timing until the beats line up perfectly. (Right-click on the first cell and select "Resize Event To…").
         2. After adjusting the first event carefully go through the entire song and make adjustments to keep things in line with the beat. Do this by shortening or lengthening the time span of events (right-click on the cell and select "Resize Event To…"). This will affect the timing for the remainder of the song.
         3. It is common to have a musical sequence hang up at the end of a song. This is usually caused by the length of the sequence being longer than the length of the music. This is easily fixed by shortening the length of the final event. Just go to the final event and reduce its length by a fraction of a second.

   b. Basic Beat and Sub-Dividing
      i. You might need to add additional subdivided beats within events. The easiest way to do this, and have the subdivided events line up with the music, is to use the "insert multiple events" command.

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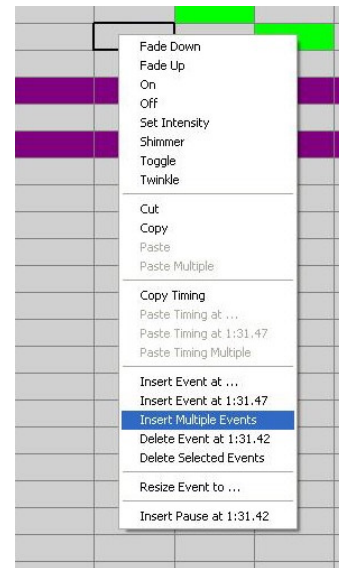
c. Straight Beat vs. Swing
    i. Many Christmas songs use a Swing Beat instead of a Straight Beat. Swing is common in Jazz and Blues styles of music. With a Swing Beat the subdivided beat isn't an even division. The first part of the subdivided beat takes up 2/3rds of the beat, and the second part uses the last 3rd of the beat. To make your sequence "pop", and line up correctly with the beats, the timings need to be adjusted to match the Swing Beat. For a simple swing beat the length of your events would look similar to the following illustration:
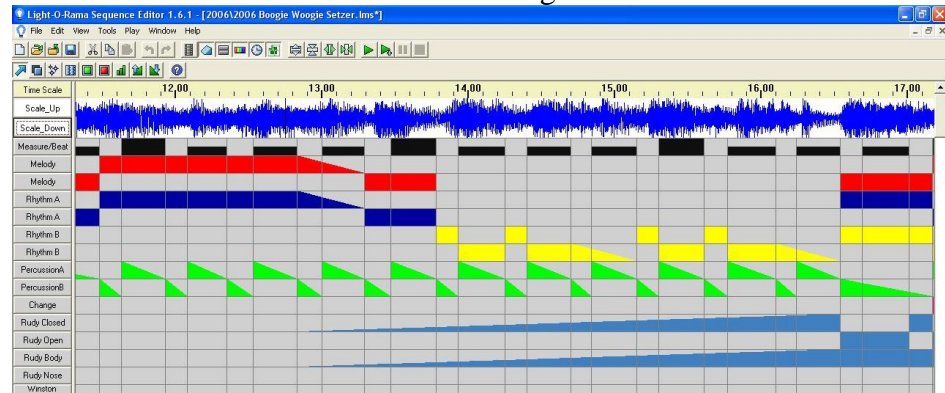
4. **LAYERING**
    a. The "Starter Sequence"
        i. A Starter Sequence is a sequence that includes the basic beats and sub beats, the **layers** of the music (melody and rhythms), and marks where the music makes a change to a new section. Each layer uses two channels.
        ii. It is used as a reference for creating your actual sequence.
        iii. The Starter Sequence includes all of the basic elements that will be spread throughout your sequence.
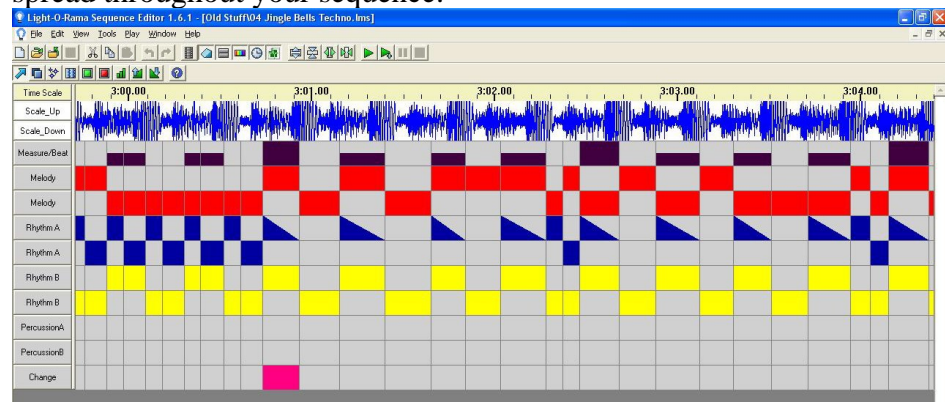
        iv. The Starter Sequence could be plugged into an eight-channel controller and used as a finished sequence.

Marty Slack

b. Layering adds depth to your sequence. Rather than just having every light in your display flash the rhythm of the melody you will have multiple layers of the song represented. It is like the difference of having a solo singer with the lights moving along to their simple song, vs. having an orchestra accompanying the singer, and one part of your display goes along with the singer while other parts of the display match the different instruments in the orchestra.

All of the above steps can be done before you know the layout of your display. Before continuing you need to know how your display will be set up and which controllers will run which lights.

5. **BUILDING THE SEQUENCE**
   a. Creating Your Channels
      i. Add the number of channels you will be using. Right-Click over the bottom channel and choose "Insert Multiple Channels Below."
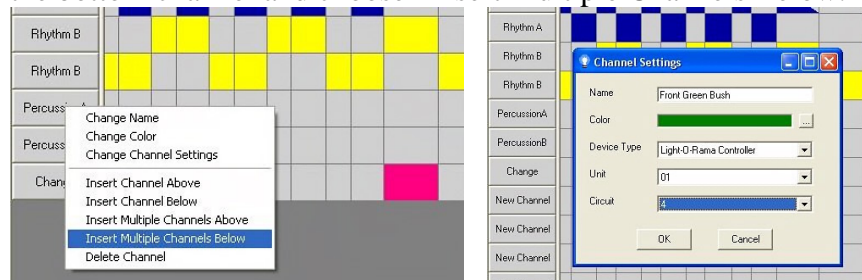
      ii. Assign each channel a name that will help you know which part of the display it will control, and assign it to the proper controller. To do this Right-Click on the channel name and select "Change Channel Settings."

   b. Make a Musical Blueprint
      i. Plan out your song. Write down which sections of the song will use which lights in your display. The loud, emotional, or moving parts use lots of lights with matching movement of lighting effects. Softer or subtler parts use less lights and more gentle effects.
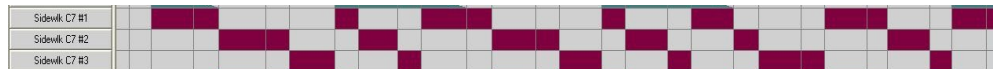   ii. Include the time stamp for each section of the song to help you locate it in the sequence.
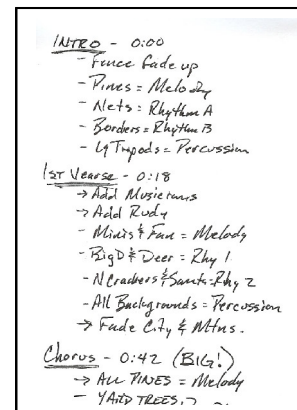
c. Spreading the Layers to the Channels
    i. Copy the events from the Starter channels to the channels where you want them. Spread the events.
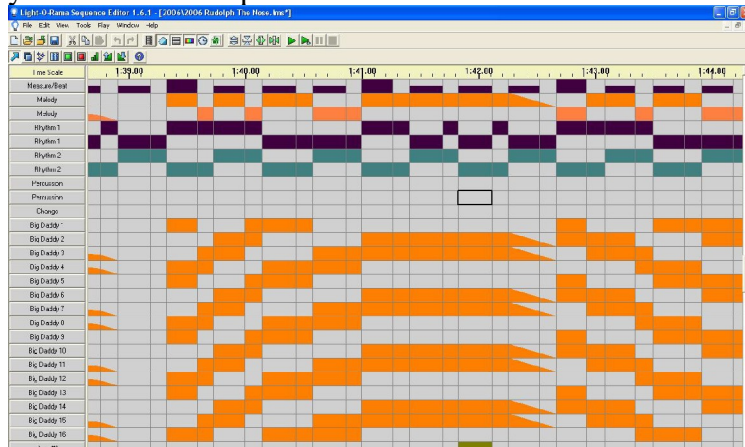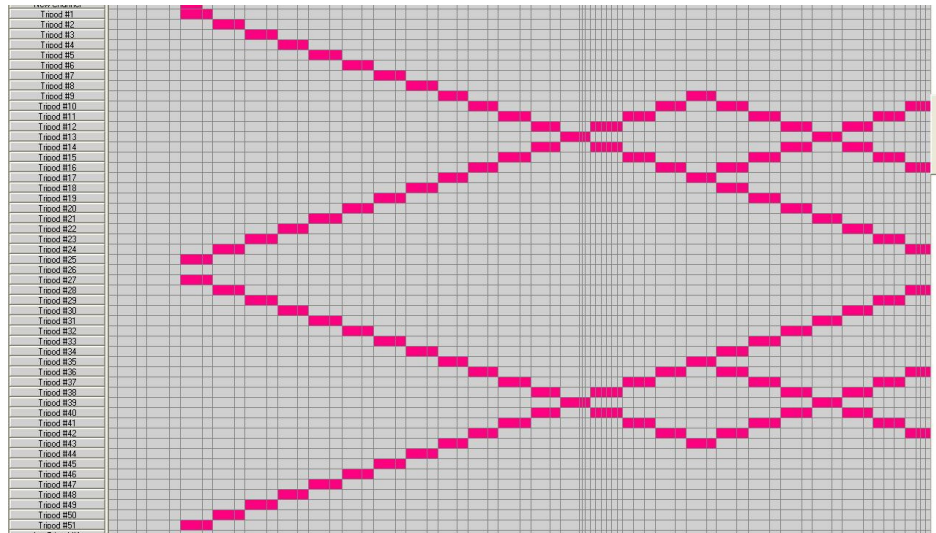

d. Effective Chasing
    i. Chases can be done with as few as three channels.

    ii. They are more effective with multiple channels of identical items. This allows multiple chase patterns to cross over or bounce off each other.

e. Effective Fades
    i. Fades work well to show changes in the energy of the song. Fading is perfect for building up to a high point in a song, or when the song is fading away.
    ii. Fades never look the same in real life as they do on the computer screen. The first part of an upward fade doesn't show up well in the lights. The final portion of the fade isn't very noticeable. The middle 2/3rds of the fade are all that are really seen.
    iii. Start the fades early and end them late. Experiment with real lights connected to a controller to make sure the fades look right.

Marty Slack

f. Matching the Intensity of the Music
    i. We already mentioned this in the section on Making A Musical Blueprint. Make sure the number of lights, their brightness, and the intensity of their animation match the mood and changes in the music.

6. **DISPLAY SIMULATOR (See it as it is)**
    a. The Animation Viewer can be a useful tool to show how your finished display will look, but it isn't as good as using real lights connected to controllers. Consider building a mini display and use it when working on your sequences. This Display Simulator will show you how the fades, chases, flashes and other effects will look in real life.
    b. A Display Simulator could be something as simple as a few strings of lights attached to a controller, or a very detailed mini-display that represents every element in your display.

7. **CREATING MOVEMENT/ANIMATION**
    a. Talking/Singing Characters
        i. Use the Wave Form Viewer to help coordinate the timing of the narration.
        ii. Every single syllable should have an opening and closing of the mouth, just like in real life.
        iii. Take your time, be patient, and try to get each syllable perfect.

b. Animated Characters
   i. Again time and patients are required to create quality animation.
   ii. Use a display simulator or the actual animated display piece while you work on the animation. Keep adjusting and making changes until it is perfect.

8. YOU ARE NEVER DONE

a. Continually adjust and make changes. Go outside and watch your light show with your visitors. Look for things that could be done better. Blend into the crowd and listen to what the guests are saying about the show. Experiment and find what works and looks best.

Additional Resources:

The Light-O-Rama Support Page: http://www.lightorama.com/support.html

The LOR Wiki: http://www.lorwiki.com

If you have questions or comments feel free to email Marty at marty@christmasutah.com
Additional information is available at http://www.christmasutah.com
Starter Sequences are located at http://www.christmasutah.com/lor.html

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