

# Digital Orchestration for the Video Game Composer



Fletcher Beasley

2012 Game Developer's Conference  
Wednesday, March 7 5:00-6:00 pm Room 3004, West Hall, 3<sup>rd</sup> Floor

[www.fletcherbeasley.com](http://www.fletcherbeasley.com)  
[fletch@fletcherbeasley.com](mailto:fletch@fletcherbeasley.com)

# Digital Orchestration Talk Outline



- I. Sequencing for orchestral performance
  - a. Phrasing and dynamic crossfading
  - b. Legato Techniques
  - c. Section specific techniques
- II. Mixing techniques for the digital orchestra
  - a. Use of reverb
    - i. Pre-fader sending
    - ii. Convolution reverbs
    - iii. Use of multiple reverbs for depth
  - b. Equalization
  - c. Panning
  - d. Mixing live instruments

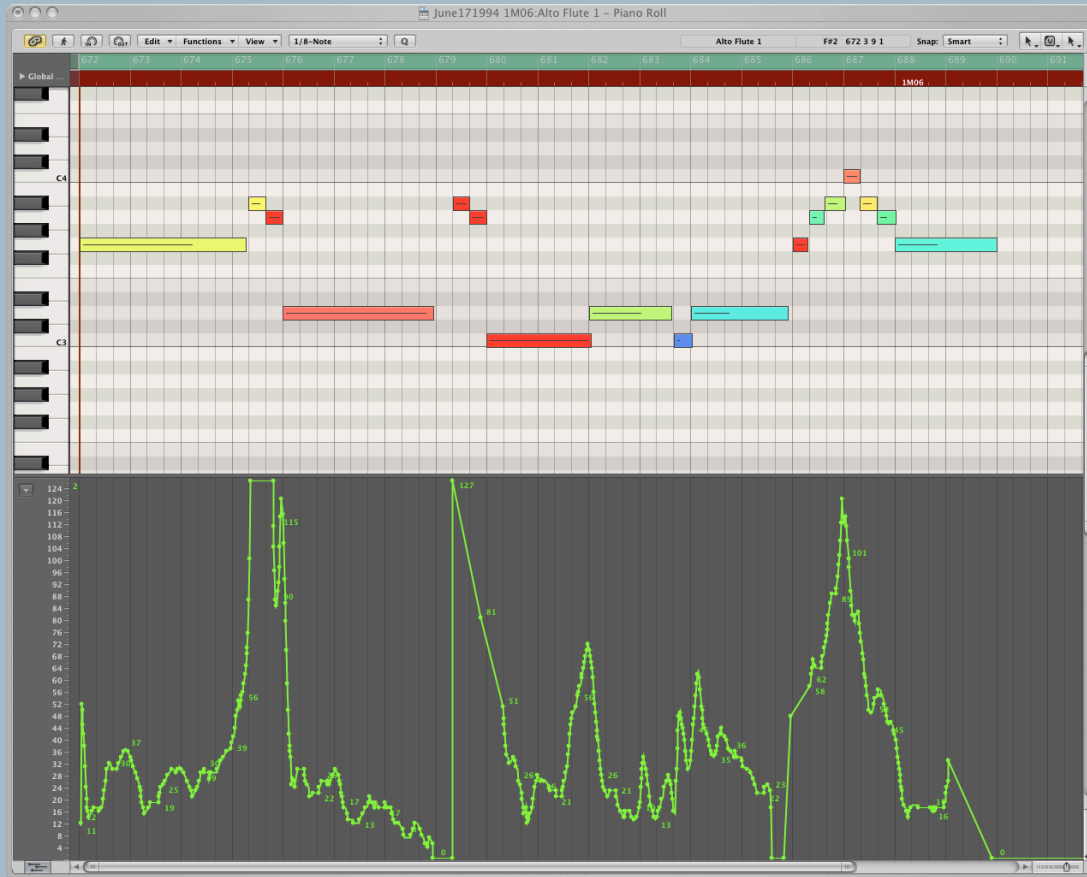
# General Sequencing Thoughts

*f*

- Create parts that are appropriate for the instrument you are sequencing.
- Be mindful of ranges and timbre of instrument in that range.
- Pay close attention to the phrasing of each part. Does the part sound good when soloed?
- Make use of MIDI continuous controllers to get better expressiveness from parts.
- In some ways easier to emulate the sound of a large, bombastic orchestra digitally, than a smaller, more delicate group because individual parts are less exposed.
- Patches that are good for composing are not necessarily the ones to use for creating a realistic sound.
- When possible, overdub real players on key parts or sections to inject life into the sequence.

# Dynamic Crossfading

*f*<sub>b</sub>



Use patches that have been programmed for dynamic crossfading for maximum expression.

# Instrument Phrasing



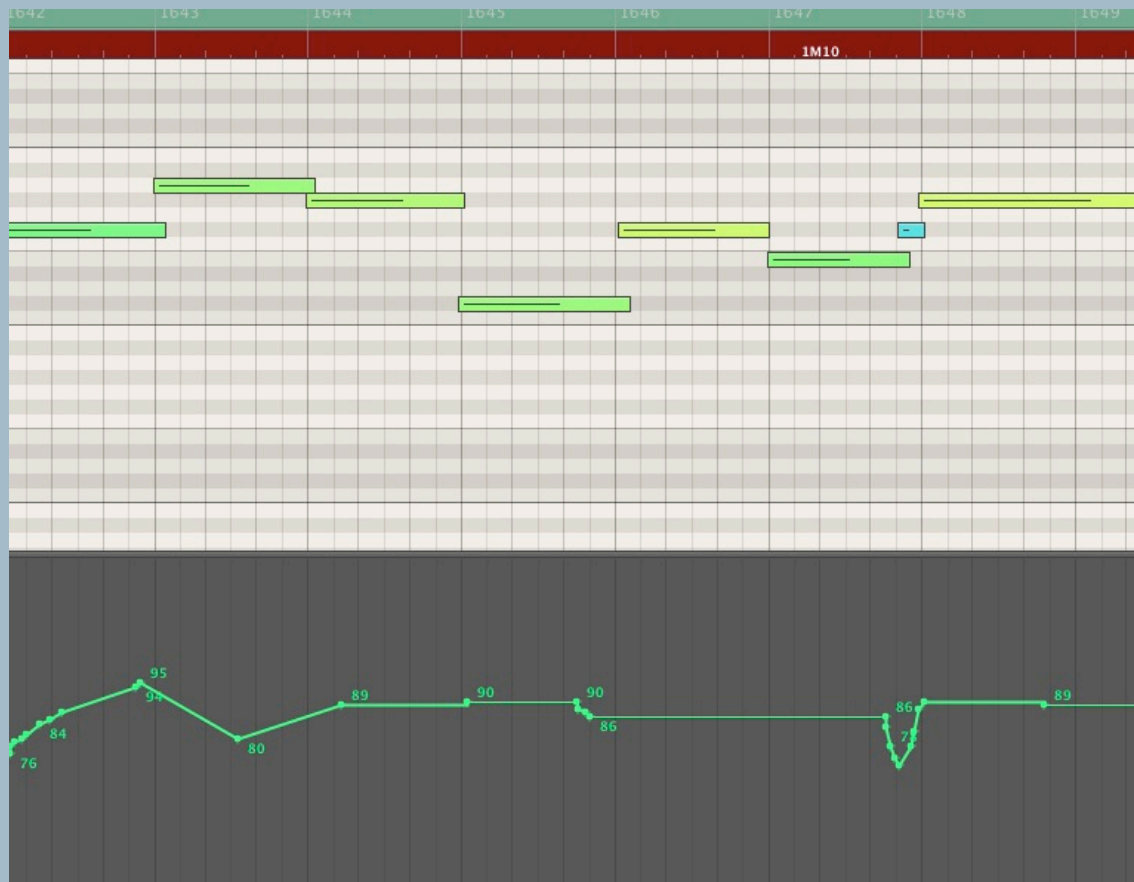
The screenshot shows a music notation software interface with a piano roll for a Horn Solo. The title bar reads "June171994 1M118:Horn Solo F - Piano Roll". The interface includes a menu bar (Edit, Functions, View), a toolbar, and a piano roll grid. The vertical axis on the left represents pitch, with labels C1, C2, C3, C4, and C5. The horizontal axis represents time, with measures 805 through 812 visible. The piano roll contains several green rectangular notes of varying durations, some with stems, and one black rectangular note. The notes are arranged in a way that suggests a melodic line with rests, illustrating the concept of phrasing for wind instruments.



Wind instruments should have spaces programmed between phrases to simulate breathes a player would take.

# Dynamic Crossfading

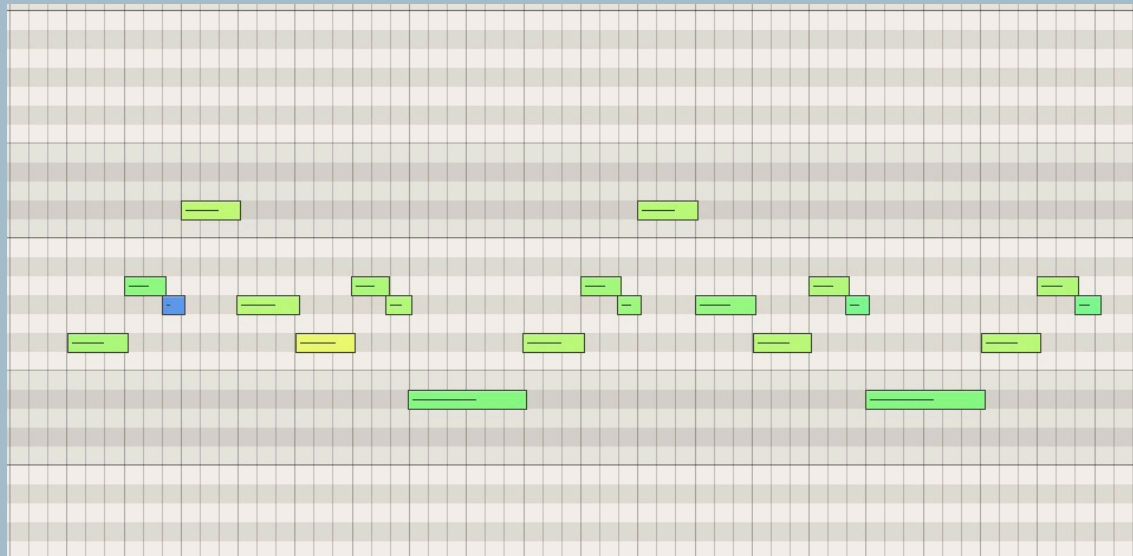
*f*



Dynamic crossfading of strings is very helpful for getting realistic performances.

# Overlapping Notes

*f*



A more natural sound is often achieved with a slight overlap of notes.

# Good Legato Results with non legato patches

*f*

The screenshot shows the Logic Pro interface for a project named "EP602 2M2 - Arrange". The interface is divided into several sections:

- Inspector:** Shows settings for the selected track, including MIDI Thru, Quantize, Loop, Transposition, Delay, Velocity, Dynamics, Gate Time, Clip Length, Score, and Advanced Quantization.
- Global Tracks:** A timeline view showing the arrangement of tracks. The tracks are labeled "Inst 10" and "Sym Strings Sordino".
- Score Editor:** Displays the musical notation for the selected tracks. The notation shows a string section with a Sordino (muted) effect. The notes are offset on adjacent tracks to achieve a legato result.
- Mixer:** Shows the output of the tracks, including "Out 1-2" and "Stereo Out".

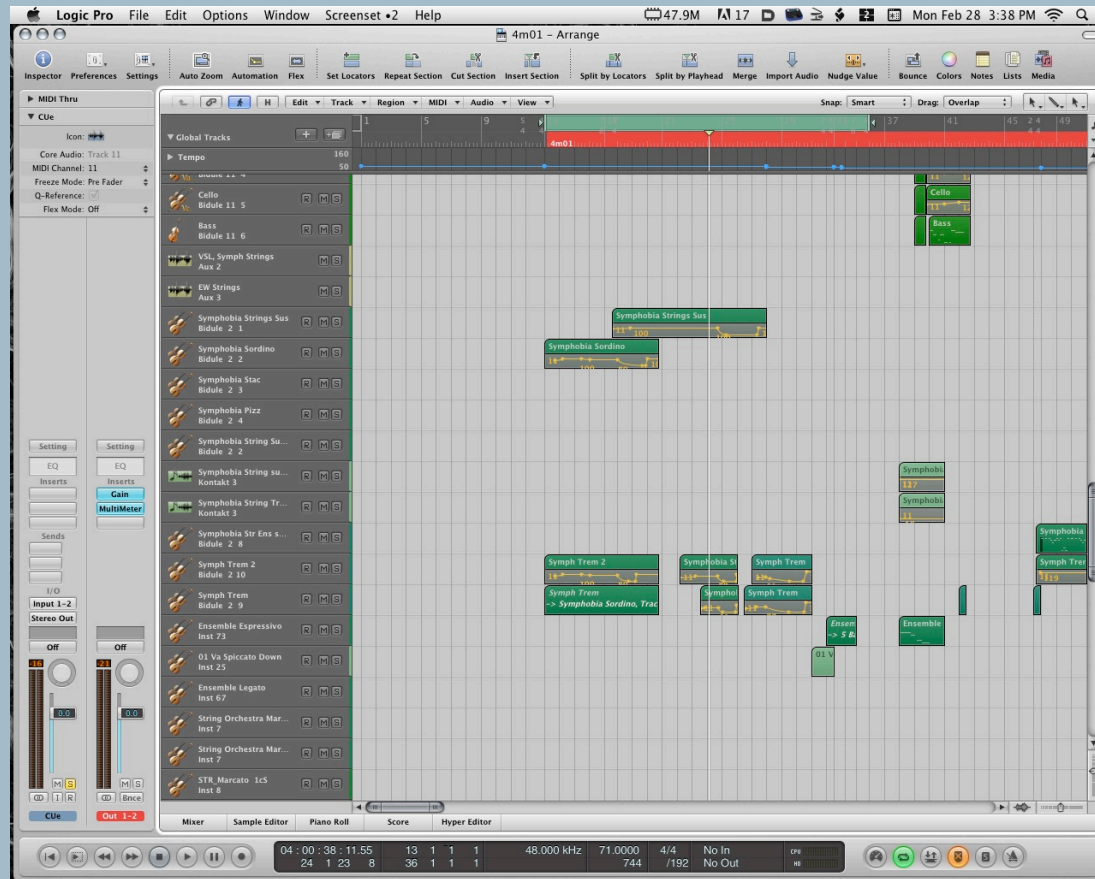
The tracks are labeled "Inst 10" and "Sym Strings Sordino". The notation shows a string section with a Sordino (muted) effect. The notes are offset on adjacent tracks to achieve a legato result.

Parts are offset on adjacent tracks using two instances of the same sound.



# Entrances and Exits

*f*



It is often helpful to program crescendos and diminuendos into the phrases.

# Entrances and Exits

f

The screenshot shows the Logic Pro software interface. The main window displays a piano roll for a project titled "Krod 106 1m20 - Arrange". The piano roll shows MIDI data for several instruments, including "Ensemble Espresso", "VI-14\_perf-leg\_p", and "VC-8\_mv\_perf-leg\_p". The interface includes a menu bar at the top, a toolbar with various editing tools, and a left sidebar with the Inspector and Mixer sections. The bottom status bar shows the current time (10:12:51:18.12) and other project parameters.

Good endings to ensemble phrases can be achieved by copying CC data from one part to another.

# Quantizing

The screenshot displays a MIDI piano roll interface with a grid. A context menu is open over a MIDI clip labeled "LASS Vlns 2 Leg". The menu options include:

- Quantize: 1/16-Note
- Q-Swing:
- Loop: ☐
- Transposition: +12
- Delay: -1/32
- Velocity: +21
- Dynamics: 50%
- Gate Time:
- Clip Length: ☐
- Score: ☒
- ▼ Advanced Quantization
  - Q-Strength: +79%
  - Q-Range:
  - Q-Flam:
  - Q-Velocity:

The piano roll shows several MIDI clips for different instruments, including "LASS Vln Harmonics", "LASS Vlns 1 Leg", "LASS Vln 1 FC Leg", "LASS Vlns 1 Leg", "LASS Ens Spic.", "LASS Vlns 2 Leg", "LASS Ens Spic.", "LASS Violas Le", "LASS Ens Stac", "LASS Vlns 1 Leg", "LASS Vln 1 FC Leg", "LASS Vlns 1 Leg", "LASS Ens Spic.", "LASS Vlns 2 Leg", "LASS Vlns 2 Leg", "LASS Vlns 2 Leg", "LASS Ens Spic.", "LASS Ens Spic.", "LASS Ens Spic.", "LASS Violas Le", "LASS Violas Le", "LASS Violas Le", "LASS Viola", "VSL Violas", "VSL Violas", "VSL Violas", "LASS Ens Stac", "LASS Ens Stac", "LASS Ens Stac", "LASS Ens Stac", "LASS Ens Stac", "LASS Ens Stac".

Light quantization can help make parts sit better together.

# Negative Note Delays

The screenshot displays a MIDI piano roll interface. A context menu is open for the 'LASS Vlns 2 Leg' clip. The menu options are:

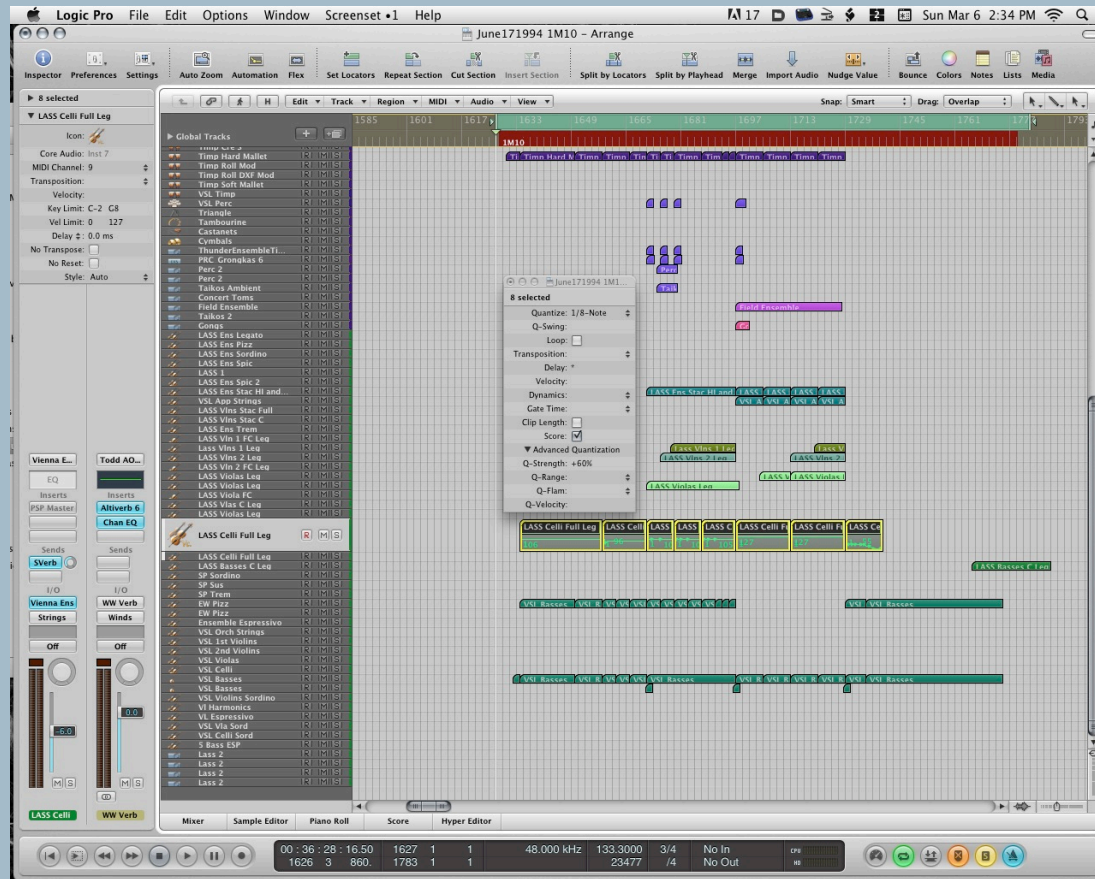
- Quantize: 1/16-Note
- Q-Swing:
- Loop: ☐
- Transposition: +12
- Delay: -1/32
- Velocity: +21
- Dynamics: 50%
- Gate Time:
- Clip Length: ☐
- Score: ☒
- ▼ Advanced Quantization
  - Q-Strength: +79%
  - Q-Range:
  - Q-Flam:
  - Q-Velocity:

The piano roll shows various MIDI notes and clips for different instruments, including LASS Vln Harmonics, LASS Vlns 1 Leg, LASS Vln 1 FC Leg, LASS Vlns 2 Leg, LASS Ens Spic, LASS Ens Stac, LASS Violas Le, VSL Violas, and LASS Ens S. The 'LASS Vlns 2 Leg' clip is highlighted in green, and its delay is set to -1/32.

Using negative delay values for legato strings is often necessary in order to get them to play in time.

# Timing Issues

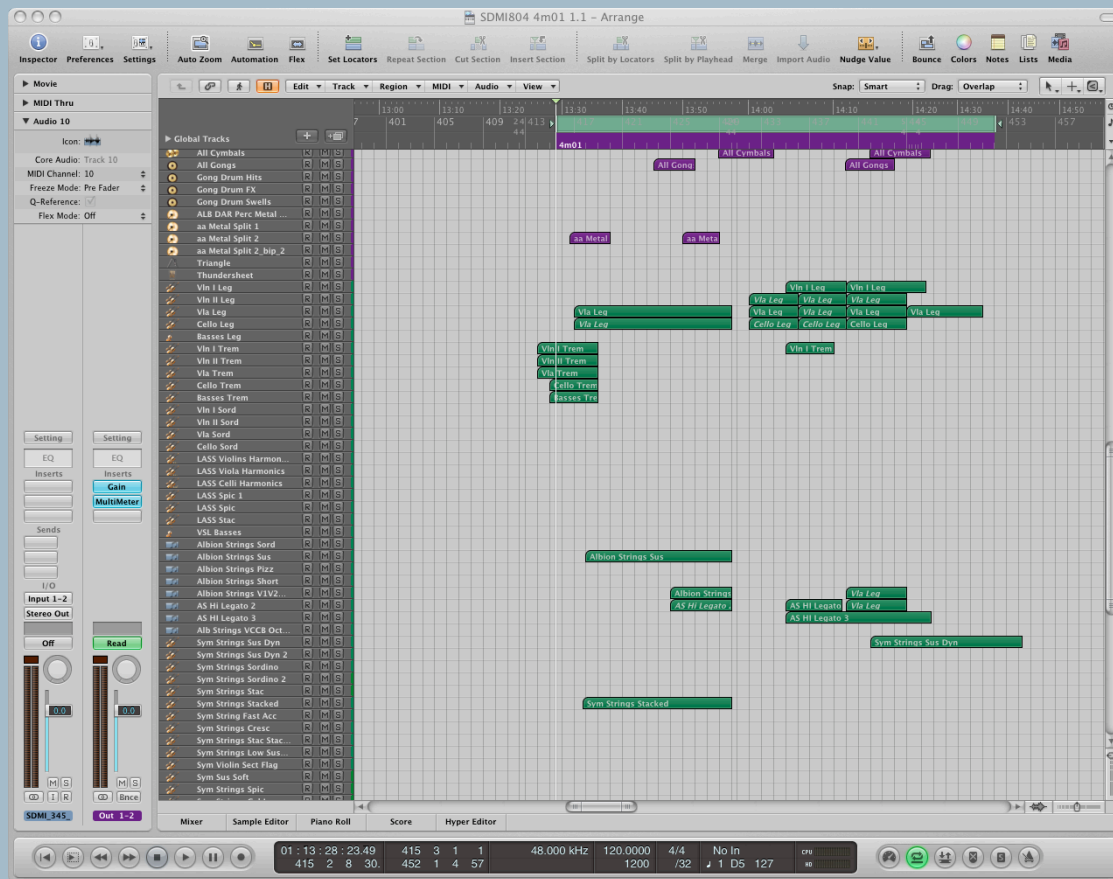
f



If parts are not jelling rhythmically, solo them and make adjustments against the click track.

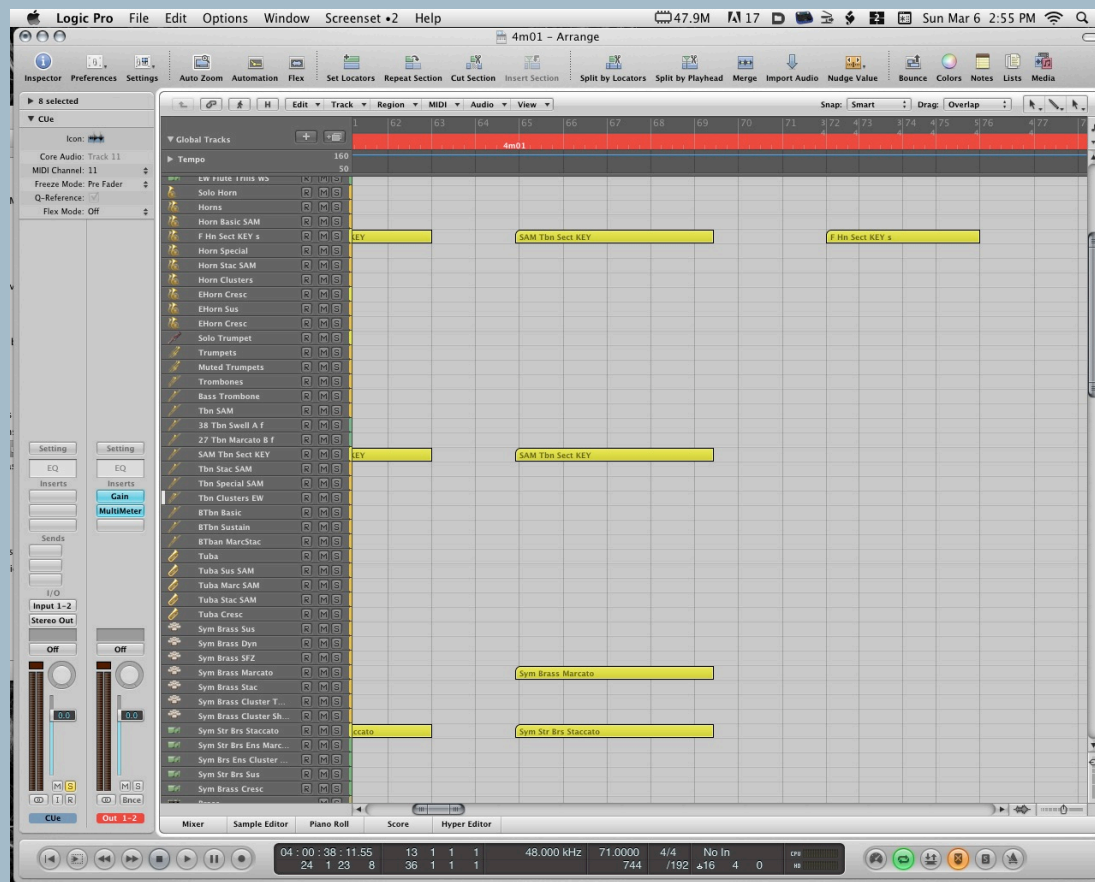
# Combining Sounds from Different Libraries

f



A better sound can be achieved by combining libraries on the same part in some cases.

# Combining Sounds from Different Libraries

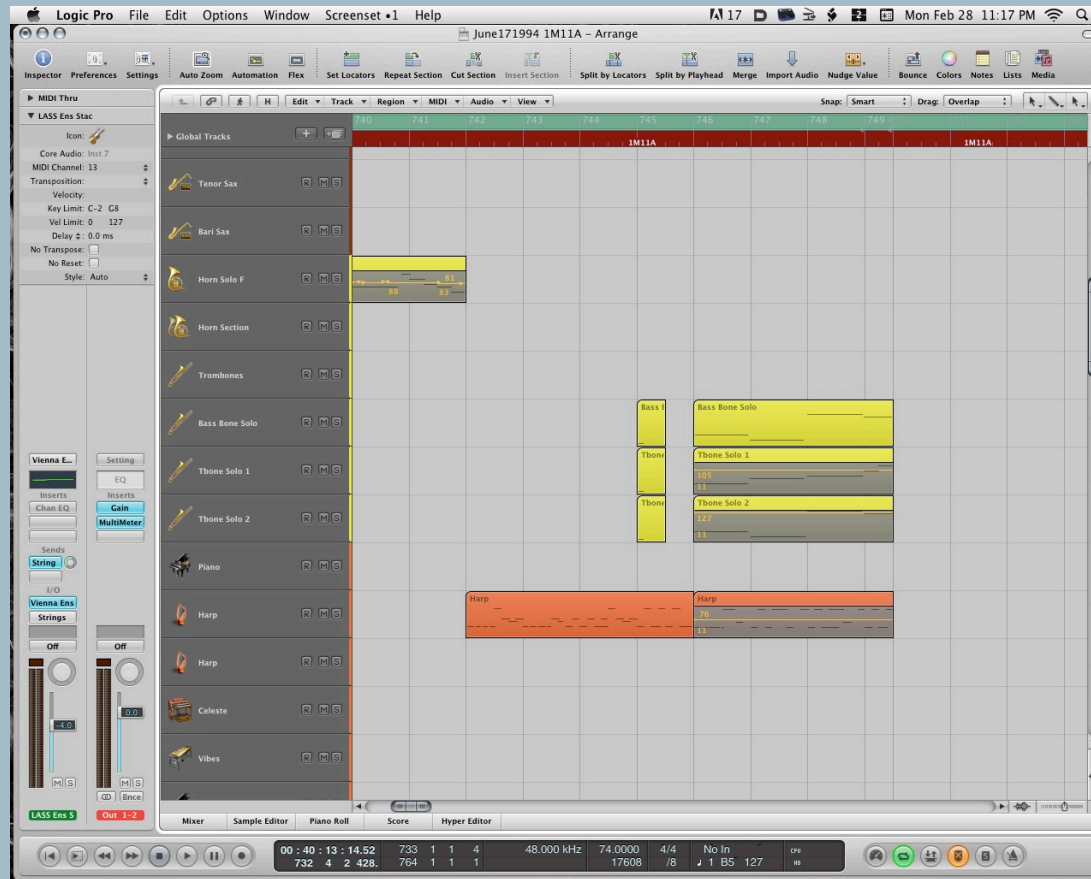


This can be quite effective for fortissimo brass sections playing in unison or octaves.



# Harmony in Brass and Winds

*f*

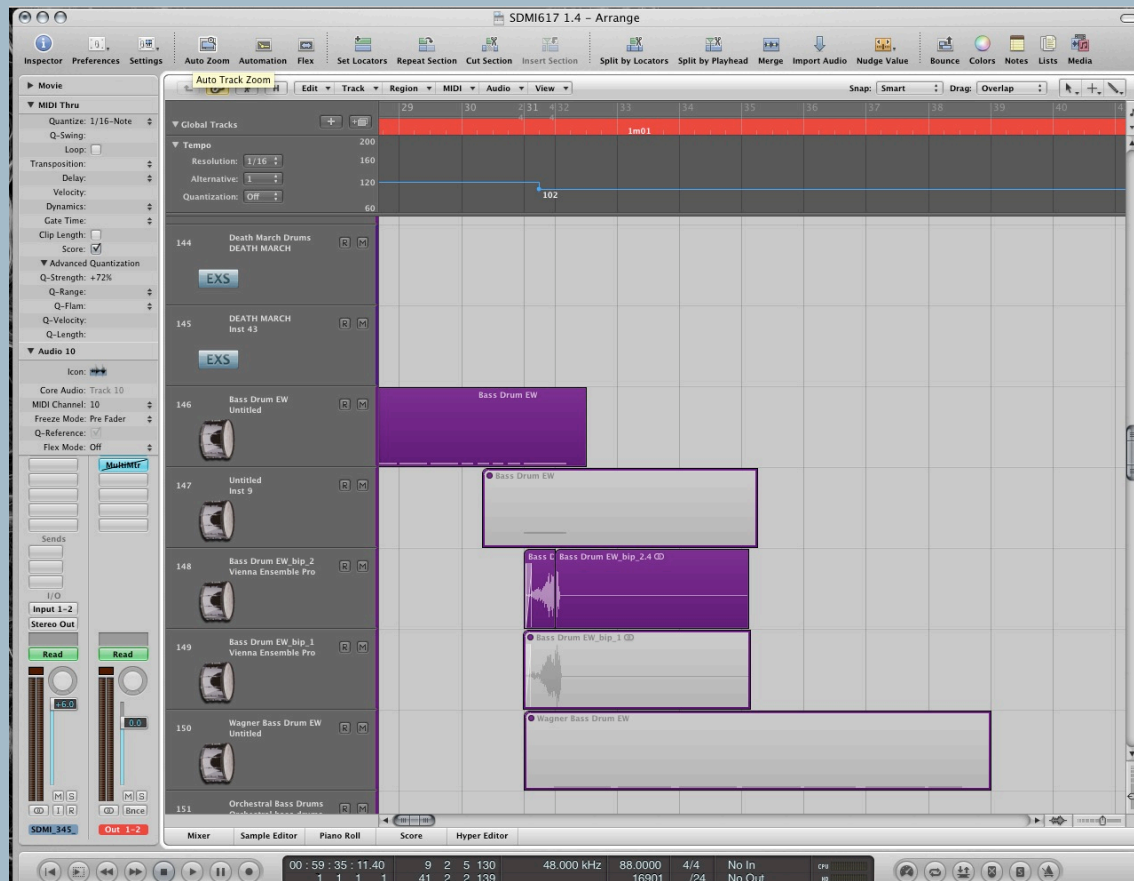


Use ensemble patches for unison parts and solo patches for harmony.



# Crescendos

*f*



Rendering crescendos as audio files allows you to fit the timing to your piece.

# General Mixing Thoughts

*f*

- Using good orchestration techniques and well balanced libraries will go a long way to getting a good mix.
- Parts that would naturally blend together with a real orchestra may require careful balancing in the digital environment. Our ears tend to hear the highest lowest voices of a harmonized part or chord most clearly, but the middle voices may be unnaturally loud in a sequence.
- When using a library that was recorded with reverb, it is necessary to match that reverb on libraries that have been recorded dry.
- Use reverb and panning to place the orchestral instruments with proper stereo spacing and depth.
- Consider what type of sound is appropriate for your orchestra. Not all orchestral recordings sound the same so it is a good idea to know what you like and what are trying to emulate.
- Reference recordings to compare your mixes to the real thing.

# Characteristics of the Hollywood Sound



- Listener is positioned closer to orchestra in Hollywood sound.
- Harp and piano often use a close mic'ed sound.
- Solo parts and sections may be close mic'ed.
- Percussion is often more up front than is possible with a conventionally mic'ed orchestra because it may have been recorded separately.
- Heightened or more present low end in Hollywood sound.
- Contrabasses may be centered in Hollywood sound.
- Instruments may be compressed so they are more present in the mix. Low pizzes and percussion may be compressed for greater sustain.
- Non traditional and/or electronic elements may be mixed with orchestra.
- A digital reverb may be used in addition to the natural sound of the hall.

- A good hall reverb goes a long way to making the mix sound good.
- Use reverbs on aux tracks and control the levels for section or instrument using pre-fader sending.
- I generally like to use one reverb per section – strings, brass, winds, percussion and keys/mallets but it is possible to get good results with a single reverb.
- When using a single reverb make sure you are sending levels that are appropriate for the orchestral section. The further away a section sits the more reverb it needs.
- Sometimes a reverb on the main output can help glue the mix together.
- Use the same basic reverb setting for different cues throughout the game in order to give a consistent sound to your orchestra. Slower pieces can have a longer reverb tail, while faster, action cues might benefit from a shorter tail. The basic hall reverb should be consistent.

# Convolution Reverbs



## Altverb by Audioease



A convolution reverb uses a pre-recorded audio sample of the impulse response to model an acoustic space and can be used to achieve the sound of an actual physical space.

# Digital Reverbs



## Lexicon PCM Reverb Plugin



High quality digital hardware reverbs or plugins can be used as well.

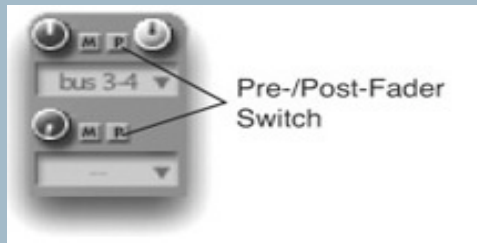
# Pre-fader Sending of Reverb

*f*

In pop mixing, one would normally choose post fader sending because you want a blend of the dry and wet signal with the dry signal being dominant. Most DAWs will default to post fader sending when you set up a send.



Logic Pro



Digital Performer



Pro Tools

In an orchestral mix, pre fader sending generally works better because you are blending more of the sound of the instrument in the space (the reverb) and will have less of the direct sound instrument.



# Using a different reverb for each orchestral section

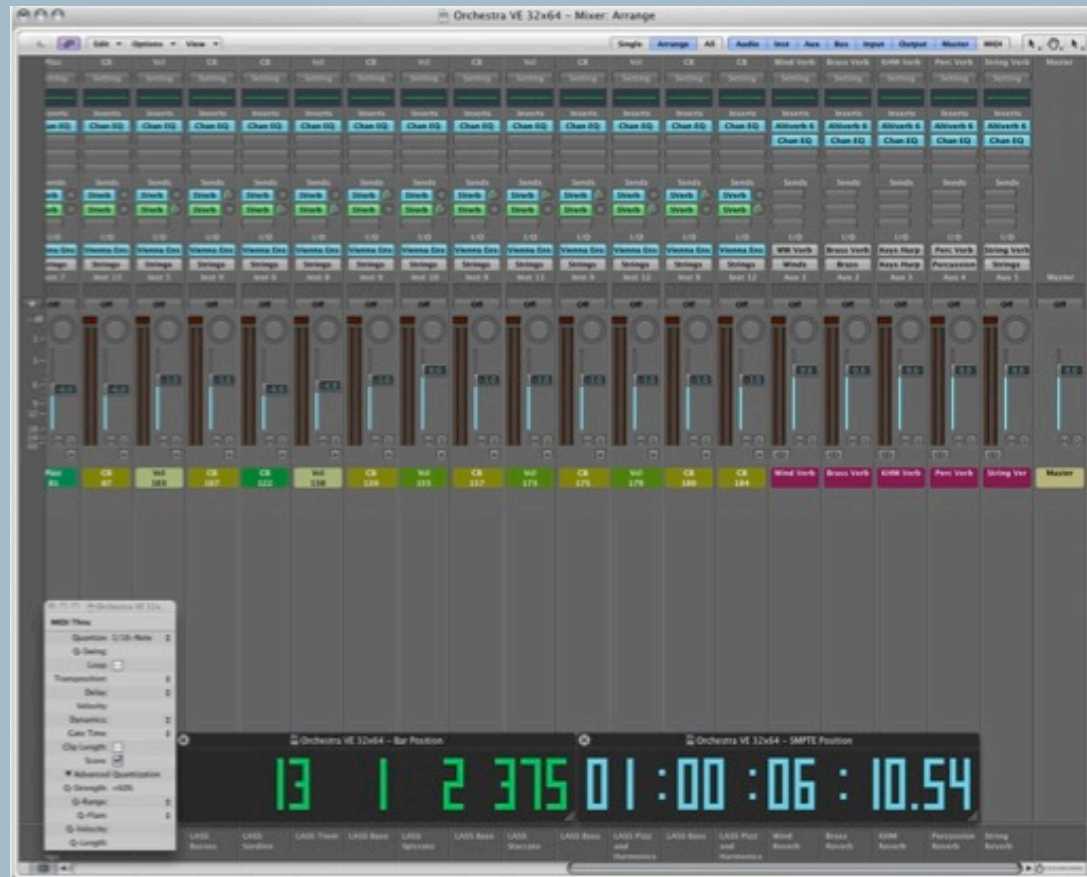


Allows for a different convolution sample based on seated position of section.



# Using a different reverb for each orchestral section

f



Reverbs on individual aux tracks per section.

# Equalization



- Basic balancing of frequencies should be done through orchestration.
- EQ can be used to balance timbral/recording differences between different libraries.
- EQ can be used to make the sound of the patch more pleasant as some libraries can have a very nasal sound.
- EQ can be used to roll off the low end of a reverb which basically sounds good but has a “boomy” quality.
- EQ can be used to roll off the low end of an instrument that has been recorded close up and therefore has more low end than would be natural in a orchestral setting.
- EQ can be used to roll off some top end to make an instrument sound further away.

# Frequency Ranges



Low: 20-200 Hz (heavy, boomy, ballsy)

Low midrange: 200-1000 Hz (warmth)

High midrange: 1 kHz-5 kHz (presence, nasal, brittle)

High: 5 kHz-20 kHz (air)

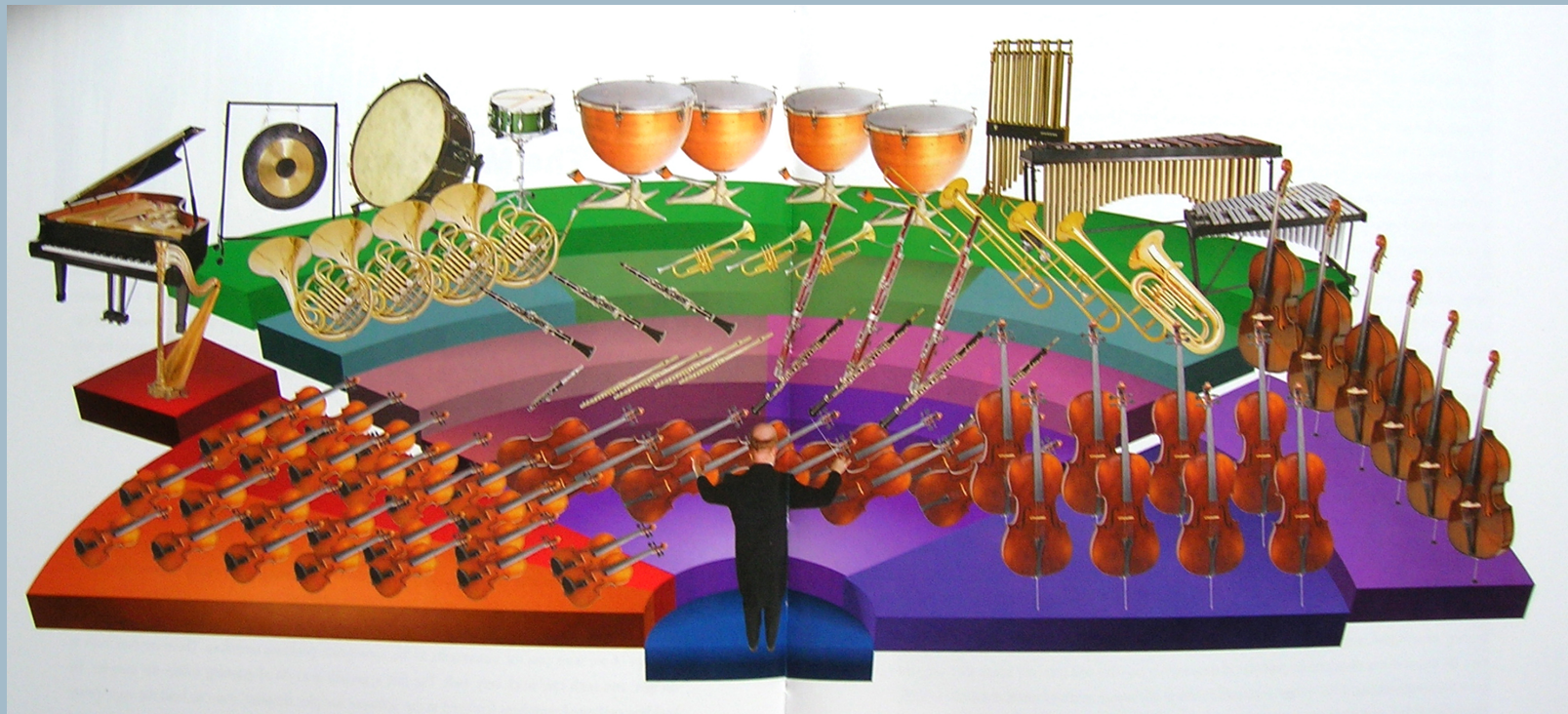
# Equalizer



An EQ is an important tool for shaping the sound.

# Panning the Orchestra

*f*



# Panning Position for the Orchestra



• Full Orchestra	10:00-2:00
• Flutes	11:15-12:00
• Oboes	12:00-1:15
• Clarinets	11:00-12:00
• Bassoons	12:00-2:00
• French Horns	11:00-12:15
• Trumpets	12:15-1:00
• Trombones	1:00-1:45
• Tuba	11:00-2:00
• Timpani	1:00-2:00
• Percussion	10:30-1:00
• Piano (non solo)	10:45 or 1:15
• Piano (concerto soloist)	11:45-12:15
• Harp	10:30
• First Violins	10:00-12:00
• Second Violins	10:30-12:30
• Violas	11:30-1:30
• Celli	11:00-12:00
• Contrabasses	10:30-2:00

# Wave's S1 Imager Plugin

*f*





# Logic's Direction Mixer Plugin





# Adding Live Players

*f*

Adding a live player or two can really bring a sequence to life. It's not difficult to overdub players individually and doesn't require an expensive studio.

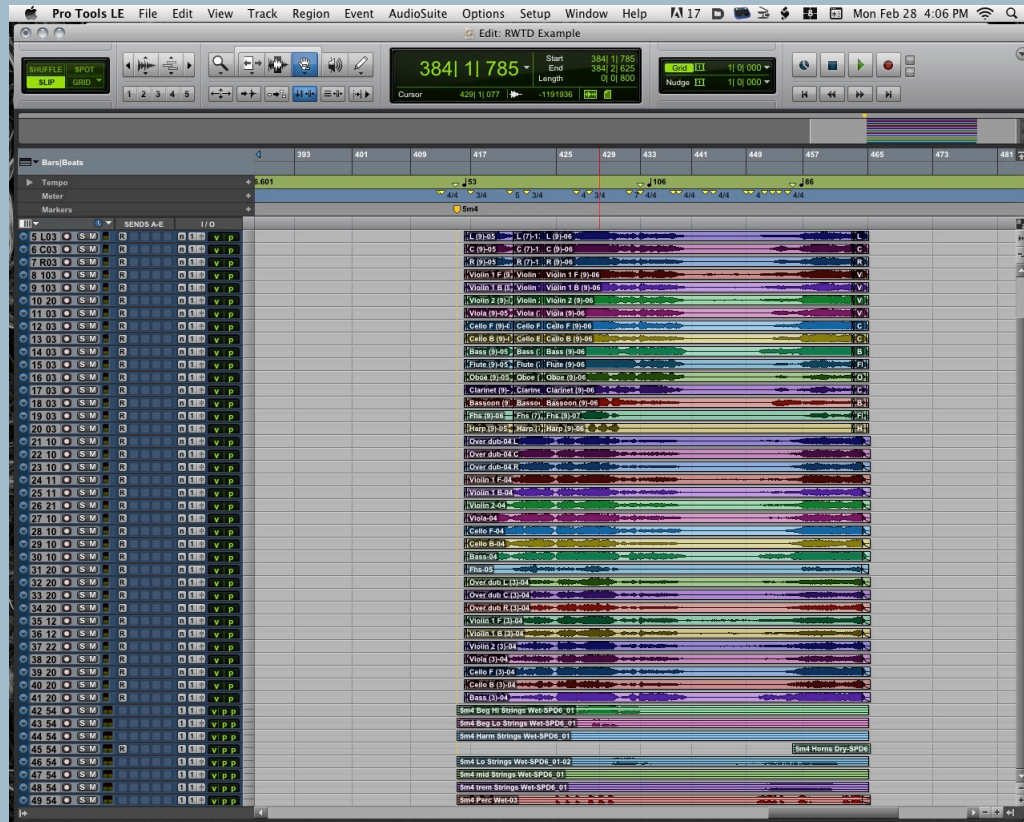
MIDI Mix



Final mix with live winds and harp



# Live/Sequenced Hybrid



Live



MIDI



Hybrid