Interview – Jerry Gerber on Masterful Virtual Orchestration

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Composer Jerry Gerber knows how to exploit a virtual orchestra with remarkable effectiveness. He shares some of that know-how in this in-depth interview.

by David Baer with Warren Burt, Sept. 2019

Jerry Gerber is a San Francisco based composer whose name might be familiar to long-time SoundBytes Magazine readers. We ran an interview with him in 2014 and he wrote a tutorial on virtual composition and production for us two years later. Those pieces can respectively be found here *and* here.

Like many serious composers, Jerry writes for large orchestra. But his orchestra, by choice, is virtual. Anyone listening to his just-released Symphony 10 (more here*) will immediately recognize his mastery of realizing a musical performance. Jerry joins us to share his vast expertise in the following interview. Whether you regard a virtual orchestral performance as a final goal or as a stepping stone to a live-orchestra performance, there is much you can learn from him.*

SoundBytes Magazine: You totally committed to the Vienna Symphony Library as your virtual orchestra some years ago. Obviously, it's a substantial investment to own the entire collection. Since that time, it seems like there's been an explosion of competing libraries. If you had it to do over, would you do things differently? Also, how can someone on the verge of making a similar commitment do so with some assurance they'll be happy with their choice a few years later?

Jerry Gerber: I am not very familiar with the libraries released in the past several years. I am not scoring commercial projects at this time in my life so I don't have to worry about having every library that might be the favorite of a particular producer or director. VSL is very powerful and I am still learning about it even though I've already produced five albums with it. If I were starting out today, I'm sure that I'd be investigating all of the newer libraries. I already use one of the best, and that's good enough for me. The library you choose is only part of the equation. Your skills in composition, orchestration, sequencing and mixing are an equally important part.

SM: For someone starting to develop their skills at creating virtual orchestral performances, how do they get started? They're unlikely to find a Virtual Orchestra 101 course at their local community college. Any recommendations?

JG: Play an instrument well. The better a player you are, the more your understanding of music will evolve in terms of programming gesture, expression, phrasing, dynamics and tone color while sequencing music in your DAW. A virtual orchestrator tells the computer not merely *what* notes to play, but *how* to play those notes. Imperfection and randomness are always a part of music making. By making use of subtle tempo changes, variation in attack and release, moving notes relative to the beat and making use of MIDI velocity and CC7 or CC11, it's quite possible to create effective, expressive virtual orchestrations. Orchestration is about texture; changing textures provides interest to the orchestration. One moment the texture might be homophonic, another moment it may be polyphonic, heterophonic or monophonic—the point is *variety*. When an instrument is not contributing something meaningful to the orchestration, delete it. Though Brahms was speaking about composition rather than orchestration, he said that composing is not difficult; what's difficult is letting the superfluous notes fall under the table. I interpret that to mean if you don't know the value and power of silence, your notes and phrasing are going to mean a lot less.

If a virtual orchestrator orchestrates a pre-existing composition that has been played and recorded by many orchestras, you have a good idea of how that work sounds and the different interpretations that may be brought to the performance. If you're producing an original work in a contemporary style that has never been performed by a live orchestra, there is no such reference point, and from a creative perspective this can be a good thing. One of the many reasons I enjoy working in this relatively new medium is that the composer can be both the creator and interpreter of a multi-timbral work. If I give one of my scores to another music producer with the same or different library, I'd hear a different interpretation, just as we do when different orchestras perform the same piece.

Go to live concerts, listen to recordings with score in hand, get a good book on orchestration by Piston, Kennan or Adler and study orchestration

techniques, some of which are transferable to the virtual medium and some of which are not. An orchestrator must have a deep knowledge of harmony and counterpoint. I don't think it's possible to grow as an orchestrator unless you hear your work—whether acoustic or virtual. Aaron Copland remarked about the "rude awakening of miscalculation"—when a composer hears her score for the first time played in rehearsal by an ensemble and discovers that the sound is not quite what was imagined. With the virtual medium, we get the privilege of hearing our efforts immediately rather than have to wait days, weeks, months, years—or never! Orchestration styles change: the acoustic orchestra has grown larger over the centuries, the pieces got longer and approaches to texture don't stay the same. Learn about transparency, orchestral weight, balance and blend. Piston's take on orchestral textures is a good thing to know about. My own interest is in using both software synths and samples; if somebody asked me to name the families in the orchestra, I'd say *winds, brass, percussion, voice, synths* and *strings*. It fascinates me how traditions and styles morph, blend, collide, disrupt, dissolve and influence new music. In this age of global cultural influence, the spread of technologies and media and communication mediums brings interconnection on a planetary scale. Rhythm, meter and syncopation are more varied than ever in our century, new styles and textures being introduced with software synthesizers are indicative of the computer age in which we live. For thousands of years we've made music with bone, animal gut, wood and metal. Our age has added electrons and electricity and bits and bytes to the methods by which humans make music.

SM: Continuing on the subject of orchestration, one can clearly do things with virtual instruments that could not be done by real performers. A looped sample of a horn player can sustain indefinitely; a real player needs to occasionally take a breath. For someone wishing to have their virtual performance eventually realized by a live ensemble, how do they learn all those rules of how to conform to realistic performance constraints?

SM (Warren adds): I teach at a school which has a lot of sample libraries and a large part of the composition course is film scoring, but our budget absolutely prohibits us (except on rare occasions) from having students have access to live performers. And seeing as how our student body is mostly oriented to popular music, the only instrumentalists easily available to them are electric guitars, electric basses, keyboards and drums. We tell the students to make sure that the ranges on their virtual parts do not exceed the ranges of the "real" instruments (although there are always excuses to do extreme things with sampled instruments!). Do you have any advice for people at schools with limited budgets as to how one can get "good" at virtual orchestration without having access to professional musicians?

JG: By working with ensembles and knowing what acoustic instruments can do well and what they cannot. Notation skills are crucial, rhythms must be notated accurately and ideas must be communicated with clarity and precision. Get students to play your pieces, ask players what is doable and what is not doable, which is relative to how experienced and talented the player is, i.e. a high school player won't be able to do all that a member of the NY Philharmonic can. Write to the medium and level available.

Every artistic medium has limits and constraints. Some people are more gregarious and extroverted, some are more solitary and independent. These qualities probably have something to do with whether a musician is drawn to writing for live players or passionate about working with digital technologies, some people are both. There are things you can do with a virtual ensemble that cannot be done with an acoustic orchestra; your example of players needing to take a breath is one of those things. And yet, breath is connected to phrasing, and phrasing is musical, so how a virtual orchestrator gives an instrument "breath" or phrasing, is worth thinking about. Just because a tone can be held a long time doesn't mean it should—unless that tone's own internal dynamics are sustaining interest in the tone. Samples and synthesizers come from two different traditions; sample libraries evolved from the recording of acoustic instruments and synthesizers evolved from the earliest attempts to create tones electronically. Both areas have had deep and rapid advancement, a software synthesizer like Dune 3 or a library like VSL are remarkable achievements in musical instrument technology.

Some music is written specifically for a given medium, for example Chopin wrote music that is composed *for* piano. Bach's music, on the other hand, works well regardless of medium; a fugue by J.S. Bach can sound wonderful when played with piano, organ, harpsichord, orchestra, chamber group, virtual orchestra, synthesizer or human voices. It's not idiomatic. Sometimes I wonder which composers of the past would be attracted to digital musical instruments and which would not. I doubt Mahler would have been, probably Stravinsky would not have either. But I think Bach would have embraced the virtual orchestra.

The politics and economics of getting a serious piece rehearsed, performed and recorded are formidable. A composer I know flies to Eastern Europe to get his orchestral works performed because it is much less expensive to hire an orchestra than in the US. He played me a recording of one of these pieces; the performance was a little above average but the recording was terrible. I suppose a composer could ask, "Would I rather have a third-rate recording played by an orchestra, or a first-rate recording of a virtual orchestra?" The answer probably depends upon how much you value music as a performance art and how much you value it as a studio art. If the opportunity of getting a work performed by a professional ensemble with sufficient rehearsal time and the prospect of a fine recording presents itself, most composers, including myself, would not turn it down. But like a poet, painter or writer, I prefer not to have to depend upon lots of people to realize my musical ideas for my recordings. At a talk I gave at the San Francisco Conservatory of Music a conducting student asked me if I thought what I was doing was "anti-social" (because no players are involved). He may have been uncomfortable with the idea of living composers deciding to write for virtual instruments; he might be out of a job! But his insecurities, if that's what was motivating the question, were unfounded, because there will always be composers who write for live players. Of course I also depend upon others to create music; I depend upon the hardware and software designers, the creators of libraries, the people who deliver electricity, etc. But I can go into the studio at 2AM and make changes to the sequence and hear those changes immediately – that's much more difficult to do when working with players.

If you want to make a living writing music, you can either score for TV, film or games or some new media that's just around the corner. Depending upon commissions to write for orchestras and other ensembles is possible, but a difficult way to make enough money to survive. Most people who get commissions also teach, either privately or in an institution. If a composer decides to score commercially, skills in the digital medium are a basic qualification because the majority of film, TV and game soundtracks use virtual instruments, sound libraries and file-based recording.

Regarding the second part of the question about schools with limited budgets – I don't teach within an institutional setting, but the answer is

practice. Getting good at anything requires practice, repetition, dedication, constancy and attention. When we repeat such behaviors we tend to get good at something; the more inherent talent we have in that particular area, the better we get. If a school budget can afford a computer, a sample library or two and a good DAW (my preference will always be a DAW that can display, edit and sequence in standard music notation), students who are curious and motivated will learn about virtual orchestration. Having a teacher the school who has experience with DAWs and computer-based orchestration would certainly help a lot.

SM: Synthesizers play a prominent role in some of your music. The clip immediately below, from the first movement of Symphony 10, is a great example (you can listen to the entire first movement here). It's not surprising that the orchestral instruments sound convincingly placed in the soundstage given that you make consistent use of VSL. But the synths (Dune 3, Massive, FM8 and Tera) seem realistically "glued" into the soundstage right along with the orchestral instruments. What do you do to accomplish that?

▶ **Symphony 10, Movement 1 Extract**

JG: When using samples with software synths, the orchestration of the samples is often derived directly from what is happening with the software synth timbres. These timbres are often complex, with multiple layers of harmonics, arpeggiation, filter morphing and other effects; all must be taken into account when orchestrating the samples. For example, when working with a software synth, listen very closely to what is going on with rhythmic variations that are programmed into the sound. Those rhythms and oscillations will give you clues as to how to approach orchestration. If a particular scale is arpeggiated in the synth, or if the synth's modulations are suggesting a particular harmony, these parameters will give clues as to how to proceed with orchestration. The reverb for the samples is done in VSL, using MIR. The reverb of the synths is handled by the Yamaha SPX2000, which I try to match as closely as possible with the MIR soundspace.

SM: And speaking of effects, do you have any other tricks of the trade that you apply to virtual orchestrations that would normally be considered bad form for a real-life performance?

JG: Many virtual orchestrators imitate the seating arrangement of an orchestra (of which there is not only one). Usually in live performance the second violins sit behind the first violins on one side of the ensemble. But I prefer to keep the first violins panned left while the second violins are panned right. The reason I do this is because listening over stereo loudspeakers or headphones is a different sonic experience from sitting in a hall listening to music. By giving more separation to the first and second violins, I believe I get a more balanced texture and the contrapuntal lines are better differentiated. But this is entirely subjective, there's really no right or wrong way to do this.

SM: Let's get to the final stage, the mastering, which you do yourself. For a largely-traditional orchestral mix, is this simply optimizing the levels for the distribution medium, or is there more to it?

JG: I master my own recordings because I want to and because I enjoy it. I don't master other people's music. There is an overwhelming, ever-present subjectivity to what sounds "good", "better" and "best". Sometimes we agree with others as to the quality of a recording and sometimes we don't. As far as mastering my own recordings, I follow the maxim that the earlier in the process a problem is identified and fixed, the better. For example, if upon listening to a passage the timpani are too boomy, I'll EQ the timpani, and only the timpani, before I render the entire sequence as a wave file. If it's a compositional or orchestration problem, fix it in the composition or in the orchestration; if the harmony or voice-leading at a given point contains a note that is not ideal for the levels of tension or relaxation you are going for, fix the harmony and don't think that you can fix it in the orchestration or the mix! If I follow this principle, and extend it out to the final mix, there won't be a lot that the mastering engineer will have to do.

When I record the final stereo wave file of a piece, I record it with reverb in place. The *microdynamics* of a piece are contained in note velocities, samples with crescendo and diminuendo, track levels, CC7 levels and other factors, such as the number of instruments. After the wave file is recorded and I'm happy with it, I listen to the *macrodynamics* of the piece. There may be sections of the piece that need to come up or down in volume a bit. In this case I will use non-destructive volume envelopes and apply the appropriate gain or attenuation and the appropriate volume curves to that one section, or even one passage, measure or fraction of a measure. I will listen to the overall track to see if any EQ or multiband compression will help make for a more smooth, balanced sound; for example if the high string tones are too strident but only when they are playing *ff,* I don't use EQ because I don't want to change the timbre at *pp* or *mf* volumes. So I will use multiband compression and that will usually do the trick. I also enjoy using a little bit of stereo widening for pieces with large number of instrument tracks, at the risk of introducing minor phase problems if the recording were played monophonically (I assume very few people listen to music in mono these days). I do all the mixing and signal processing in Digital Performer 10 and export audio with the non-destructive signal processing to a new wave file that embeds all the processing into it. After I complete work on the wave file, I usually normalize peaks to -1db. I use a 2-track editor (Sound Forge for many years, now using Acoustica 7) and finally, CD-recording software where each CD track volume envelope is balanced relative to the other tracks.

 SM: The third movement of Symphony 10 is distinctly choral – an excerpt of that movement is below. There's something quite interesting happening there – the chorus sounds like it's almost singing phrases or at least distinct vowels much of the time, but the score indicates no such thing. What's going on there?

SM (Warren adds): On a compositional level, with the increased availability of samples, we can, of course, include anything we like in any composition at any moment. But I was wondering if you had anything to say about why voices occurred in the third movement, and why voices then didn't appear in the other movements.

▶ **Symphony 10, Movement 3 Extract**

JG: As I mentioned earlier, I consider the virtual orchestra to consist of six instrument "families": winds, brass, percussion, synthesizers, voice(s) and strings. In several of my symphonic works I've included choirs and/or solo voice, as it adds a human touch to the sound. There are vocal samples in my 5th, 8th, 9th and 10th symphonies. Sometimes the voices play a solo, melodic role, sometimes they work as a full choir,

and other times they are treated as instruments that are part of the mix, but not necessarily taking a lead role.

In the 3rd movement, the SATB *individual* voices are created with VSL's choir library and the *full choir* voices with the Requiem Pro library (if you look at the score, you'll see what I mean). The syllables from the VSL choir library are changeable with CC and patch changes, whereas the full choir Requiem Pro library has an ingenious method of triggering different syllables when a note is struck. I put those syllables in an order that sounds musical to me; they are Latin syllables that, when translated, would not make literal sense, but they work as musical sound. I don't notate the vocal syllables for that reason.

SM: Finally, a couple of questions that may (or may not) be connected. In the above score graphic of the start of the fourth movement of Symphony 10 we see music that would be painfully unmusical and mechanical if it were produced with a sequencer playing precisely quantized MIDI notes (click on the score to be taken to a web page from which you can view the score in its entirety). Yet the score itself is pristine. So first, how do you achieve music that's fluid and breaths using MIDI sequencing? An audio clip of the start of the fourth movement is immediately below. And second, how does the MIDI get transformed into an impeccable score (or is it the other way around)?

▶ **Symphony 10, Movement 4 Extract**

JG: I try to think like a player; how would a player phrase this line? How would a live musician attack and release this note? How does the length of a note and the space between the notes add to the feeling of musicality? What gives music a sense of gesture, expression, nuance, intention and phrasing? I like to say that MIDI makes a lot possible, but it doesn't make it necessarily easy. Because a computer can play music with an incredible degree of precision and accuracy, how do we prevent that precision and accuracy from degrading into sounding mechanical, lifeless and robotic? A big part of the solution to this problem takes place in composition, not production. If the Los Angeles Philharmonic plays a piece that isn't very interesting, the very fact that highly skilled musicians are interpreting the piece adds intrinsic value that might even mask the mediocrity of the composition. With computers, we don't have that luxury, if the piece is crappy, say the voice-leading is poor, or the harmonies don't really make sense or the rhythmic is unnatural—the computer will unfailingly reveal these weaknesses in the composition. The challenges of getting a computer to sound musical are not much different than getting any musical instrument to sound musical. The techniques are different, but musicality is musicality. Beauty of tone is worth striving for regardless of medium.

After finishing a composition and the sequence, but before I render the MIDI data to a wave file, I create the score. I use MusicXML in Digital Performer and export the file into Sibelius. From there I add the names of the synth timbres, I add tempo marks and some other markings, such as mute, pizzicato and trills. What I don't do is add all the marks that players need for dynamics, phrasing, bowing, breathing, etc. Why? 1) There are no players, and 2), this information is abundantly programmed into the MIDI sequence. If at some later date live players might be involved, then I will add those additional markings. I once produced a piece for eleven virtual wind instruments and a publisher wanted the piece to offer to players. I added the breathing, phrasing and dynamic marks for the players and published the score. Another important reason I create a score is that it's a good way to find mistakes and miscalculations. By bringing the visual sense to the creative process (essentially adding more "brain power") it allows me to sense the structure and ideas in the piece in greater detail. Finally, I create the score for teaching purposes; it helps my students to understand orchestration details when you can see them symbolically on the page. However, if I write a piece for only synths, no orchestral instruments and no samples, I sometimes don't even create a score at all.

SM: Jerry, thank you so much for sharing your thoughts and expertise. This has been a fascinating discussion. As a parting gift to our readers, we include one final clip from the symphony's second movement just below.

▶ **Symphony 10, Movement 2 Extract**

JG: It's been a pleasure. I will end by saying I believe music is an evolutionary art. By this I mean our capacity to appreciate harmonics, timbre, melody and structure can evolve, progress and improve. We are living at a time of accelerated change and development – faster than any other time in human history. As scientific materialism continues to wane, we have a new danger: the attempt to separate intelligence from consciousness. Consciousness delights in nature, beauty, creativity, ethical and moral actions, compassion. A robot, no matter how much intelligence it acquires through ever-improving algorithms and skillful programming, will never personally experience the pleasure of rhythm, the joys of creativity, intimacy or fellowship. Yet I have little doubt that the trans-humanists believe they can – and will – achieve such God-like goals. Science and technology of themselves will not solve our deepest personal and social problems, which is why society needs music and the fine arts to help us remember that if the economic and political systems we create serve humans faithfully, our species will prevail. If people devote themselves to serving systems that serve above all else their own preservation, science and art become weaponry and propaganda. Science will never prove that the soul, personhood, conscience and individuality are more than molecules, hormones, neurons and synapses. The arts suggest otherwise to me; that the purpose of the cosmos is for intelligent beings to study and appreciate. Science studies the cosmos

objectively, art mirrors the cosmos subjectively. Otherwise, why have a universe at all?
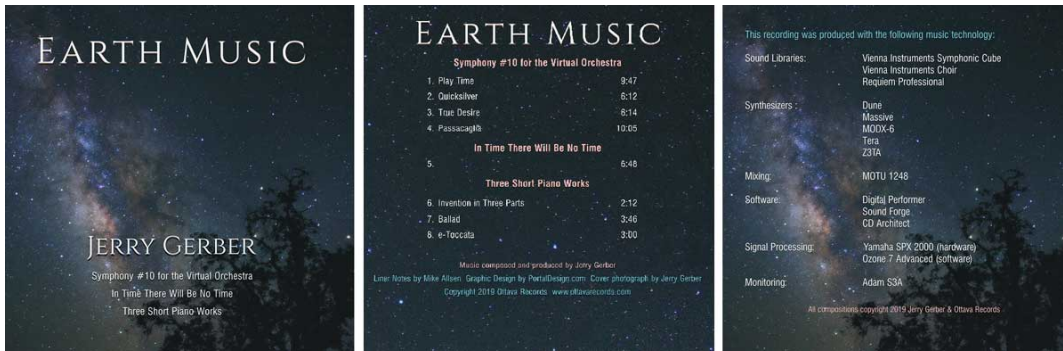
Jerry's Symphony 10 (and other compositions) may be purchased here:

https://store.cdbaby.com/cd/jerrygerber6

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