

# jazzing up numbers

By Gregg Wager

## WITH HIGH SCHOOL CHEMISTRY

A few years before Elvis ever shook his pelvis, a group of young European composers met for summer school courses in the small German city of Darmstadt. Although they all grew up in countries withered by Hitler's cultural vacuum, the outspoken lads obsessed with each other over the once outlawed ideas of Arnold Schoenberg and his way of composing music with 12-tone rows. They proceeded to make a noise for themselves, literally, plunging into new extremes of note-counting, mathematics, Fibonacci

numbers, and calculating anything and everything on their handy slide rules, turning the results into music.

In the field of what we still awkwardly call "classical music," this era of numbers, dubbed "serialism" (after the word "series," i.e. a series of numbers), still elicits much shock and horror. "By golly," the pooh-poohers still claim, "if the dissonant 'noise' created at the beginning of the century by composers such as Schoenberg and Stravinsky hasn't already killed music, these

pseudo-scientific serialists want to embalm it with inorganic, synthetic numbers." Outspoken naysayers aside, it was an exciting time to create music and Darmstadt alumni such as Karlheinz Stockhausen, Pierre Boulez and Luciano Berio still compose prolifically.

Now, in the age of home computers, when once time-consuming mathematical calculations take only a few seconds to accomplish, guess who's reinventing serialism? Enter flamboyant jazz percussionist RoyEl of Bela Fleck and the Flecktones (nee Roy Wooten, a.k.a. "Futureman" or "Futch" for short). One of the first in what could possibly be a long line of "jazz serialists," RoyEl delves headfirst into numbers, wandering fearlessly into the very sticky wicket that made serialism the musical hot potato of its day.

"Music and mathematics are the universal languages," observes RoyEl, discussing his theories in a telephone conversation from his home in Nashville. "I really believe that math is a code from the creator."

For years, jazz musicians have emulated classical music, comparing the simplicity of jazz during the early Dixieland years to Mozart, and the complexity of John Coltrane and Miles Davis to Schoenberg and Stravinsky. So why shouldn't jazz naturally stumble across the same sort of note-counting that the Darmstadt composers encountered 50 years ago?





**“I use ignorance as a tool to keep digging in. I’m holding on now and getting dragged along.” — Futureman**

“Making music this way is so natural, it’s supernatural,” RoyEl insists, referring to his newest musical projects based on Fibonacci numbers and the non-repeating numbers after the decimal point of  $\pi$ . “A baby could do this,” he claims. Well, maybe a very gifted baby.

RoyEl dresses in a Colonial-era three-pointed hat and, like Merlin, claims to have been born in the future (13 October 2050, to be exact). A cross between microtonal instrument-builder Harry Partch and funkster Bootsy Collins, he explores the world of drumming with his fingers, usually on a visually attractive, homemade instrument. Named after its creator, the “RoyEl” resembles a stenographer’s machine, and has a modified, touch-sensitive keyboard that does something else quite extraordinary—the standard abbreviations for the elements of the periodic table on each key. How on earth (or off earth) did those get there?

#### Quantum leaps

If you’ve ever heard the music of Bela Fleck and the Flecktones, you know how they interweave wildly diverse styles on top of founder Bela Fleck’s steady banjo picking. RoyEl’s finger-drumming hops and moon-walks in and out of this groove, but sometimes his curiosity for numbers will kick in, although he can’t tell us exactly why.

“I use ignorance as a tool to keep digging in,” RoyEl admits when attempting to pinpoint the origins of his inspiration. “I’m holding on now and getting dragged along.” That is, dragged headfirst into atomic numbers and quantum mechanics.

Actually, his newfound atomic inspiration originated from his old friend Dr. Wayne Kirby, whom RoyEl refers to as “Dr. Chaos.” Kirby designed the program “Phi-Music™ Microtone/Brainwave Generator” (available at [www.seriouscomposer.com](http://www.seriouscomposer.com) for \$159), which will allow any MIDI keyboard to adapt 39 different tunings all based on systems other than the 12-tone equal-tempered scale (what almost all of today’s keyboards are ruthlessly tuned to at the factory). Among Kirby’s selection of obscure Western and non-Western tunings, abstract mathematical tunings, and several hypothetical

tunings proposed by synthesizer pioneer (and Bob Moog collaborator) Wendy Carlos, lurks a whimsical tuning Kirby calls “Atomic Reciprocals—Lawrencium Lowest & Hydrogen Highest.”

During a telephone conversation Kirby explained that “this tuning is based on spectrographic analysis of each element of the periodic table in which the measurements of the various light frequencies are ‘octavized,’ that is, taken down several ‘octaves’ (where simply halving any numerical value constitutes an ‘octave’ since acoustically an ‘octave’ is a 2:1 proportion) ‘until the values equal frequencies in the audible pitch range.’ Using what’s left of your high school chemistry, you might just find an enticing application for such tunings on your own equipment (safety goggles and protective apron not included).

To create the custom hardware for his “RoyEl,” the Futureman also employed the skills of David Van Koevering ([www.vankoevering.com](http://www.vankoevering.com)), a veteran advanced keyboard designer. Where the traditional keyboard uses 12 halfsteps per octave, the “RoyEl” squeezes in seven more keys per halfstep. A color scheme helps keep track of where the 12 tones of the traditional keyboard are. RoyEl also discards the traditional ordering of the elements as arranged on Kirby’s software, placing them—from “low” to “high”—

according to what he hears as a central pitch in each of the 103 chord-like timbres.

“It’s more than just an experiment now; it’s a milestone in music,” claims Van Koevering, convinced that this atomically tuned instrument will “surpass our traditional, 12-tone, equal-tempered scale and way of thinking about music altogether.” He even speaks about a near-death experience a few years ago and compares what he then experienced to RoyEl’s microtonal solo performances. “I was literally weeping when I heard these sounds again,” admits Van Koevering.

#### Moog changes

Actually, Van Koevering started his career collaborating with Bob Moog on the legendary Minimoog in the 1970s (now being rebuilt by a Welsh company called Moog Music Limited). He might, therefore, have good reason to believe his newest work with atomic numbers is on to something equally legendary.

RoyEl gladly assumes the role of wizard or alchemist who can unravel the true mysteries of the Kirby/Van Koevering creation (all somehow in the “key” of Moog). He envisions a great melding of language and music as well, since the symbols for the elements on his instrument resemble word fragments (i.e., phonemes) and he creates nonsensical words with them in the heat of improvisation.

Because his curiosity for numbers and his newest instrument represent a vastly different direction than what the Flecktones do, RoyEl has been experimenting with forming his own ensembles, trying to get trained musicians to hear and play the new intervals on traditional instruments. At times, he compares himself to Oppenheimer (the inventor of the atomic bomb): “I gather the best minds I can find, manage their clashing egos and talents, and hope, in the end, to make a breakthrough into new, important musical discoveries,” he declares.

Other times, he even compares his ascent into the cryptic abyss of symbols and new sounds with Champollion, who cracked the code of the Rosetta Stone: “First say the words, then play the words,” he urges. “We live in the information age and that’s what this music reflects.”

Information Theory, after all, originated 50 years ago, inspiring much of what the Darmstadt serialists did, not to mention what RoyEl is now discovering for himself on a similar but new path. Yet the question begged 50 years ago is still begged today:

runover

How much of this music's effect depends on the actual numerical calculations, and how much on the myths our imagination creates about these numbers?

"After all, Einstein said that imagination is more important than knowledge," RoyEl reminds us. Who knows? One day he might hit the right chord and, poof! disappear before our very eyes.