

“There is compatibility between local universes and global universes. These are artifact points of view.”¹

It’s been twenty-six years since the first release of David Rosenboom’s *Future Travel*—long enough to meaningfully ask, what part of its metaphor of the future still rings true? The reissue of this music, long unavailable since its release in 1981 on a 12-inch vinyl disc well before digital recordings were ever sold, provides the opportunity to look back at where we have come since music went digital. But this sonic spaceship is also a time capsule, reflecting the vision from that brave new world of digital culture and music that Rosenboom had a pioneering role in creating. New music is conventionally labeled as being “ahead of its time.” The cartoon-colored rocket illustration on the *Future Travel* record sleeve reinforced that promise; but looking back, its music instead becomes a mirror that reflects its time.

This was one of the first recordings made primarily with a digital synthesizer—and like many such recordings since, it was made by a single composer working in a recording studio, playing all of the music by himself, using the synthesizer, a few acoustic instruments, and the studio itself as his orchestra. The synthesizer was the Buchla Touché, fresh from the workshop of the Berkeley, California, inventor Don Buchla, shaped by his collaboration in its design with the composer, pianist, and visionary electronic musician David Rosenboom. In a very real sense, this instrument was the child of their collaboration, and *Future Travel* was the Touché’s first musical product released to the world, one which demonstrated that a real-time digital instrument was capable not only of producing a wide range of innovative sounds, but of achieving what Rosenboom boldly claimed as “intelligence.” *Future Travel* was, among other things, a “proof-of-concept”: that a digital music instrument could be played in real time by a virtuoso performer, creating a music that pushed the boundaries of both popular and experimental music genres. It predicted a future in which composers would perform live with computers, and would be free to adopt with them musical roles normally assigned to any traditional instrument, including melody, harmony, bass, and percussion—and beyond that, that they would be capable of playing new music using rhythms, tunings, timbres, and textures that had never been possible before. The significance of this recording may be seen in this light as one of the early steps in the development of a cyborg musical art: a music made by humans interacting with the electronic instruments in which they had embedded compositional behaviors.

This history began with James Tenney’s work in the early 1960s at Bell Labs in New Jersey, creating the first significant digitally synthesized music using algorithms written in a computer language.² Later, in 1969, John Cage and Lejaren Hiller’s exploration of composition with computers at the University of Illinois resulted in HPSCHD, a monumental multimedia sound environment, which included digitally synthesized music programmed by Hiller.³ Meanwhile Gordon Mumma, collaborating with David Tudor, invented what he called “cybersonic” music, using circuitry he designed and built as wearable, real-time instruments.⁴ These were essentially analog computers that performed real-time analyses of acoustic sounds and physical spaces, storing information that subsequently influenced the generation of live electronic sounds. And by the early 1970s, David Rosenboom was performing “brainwave” music by analyzing the low-frequency electrical waves generated by his and other performers’ brains, using the results to control analog sound-generating circuits.⁵

The 1970s also saw the commercial release of analog electronic music synthesizers, which became small and cheap enough to move from exclusive residence in electronic music and recording studios and onto the popular stage, where they became part of the vocabulary of rock, jazz, and funk music. They usually included conventional keyboards and gradually became capable of expanded polyphony, making them competitive with the older electronic organs, but with a more flexible and new timbral palette. Electronic music thus split into popular and experimental branches. Experimentalists continued to pursue new music based on explorations of pure waves, feedback, noise, and the quirky characteristics of electronic crystals, electromagnets, capacitors, tubes, and transistors, without trying to shape them into conforming with older musical traditions. Popular musicians, on the other hand, quickly merged synthetic sounds into older styles still based on conventional tunings, scales, and harmonies. The quirks of the analog electronic medium were problems they had to overcome, rather than resources to exploit, while manufacturers continued to upgrade their instruments on a trajectory headed toward the digital synthesizer, which arrived in mass production by 1984. (Survivors of this older analog synthesizer era have now become heirlooms, admired for the same quirks of their character that made them disposable in the market when digital synthesizers came into being.)

But there were other branches of experimenters seeking a way to bring the potential of algorithmic composition into live performance using digital, as well as analog technologies. Composers around Mills College in the San Francisco Bay Area, including Paul DeMarinis, Frankie Mann, John Bischoff, David Behrman, and the League of Automatic Music Composers, began using primitive microcomputers to make digital music as soon as they became available to the hobbyist

community in the mid-1970s.⁶ The synthesizers made by Don Buchla in Berkeley, whose instruments had long been favored by composer/performers from within this community (including Morton Subotnick and Pauline Oliveros), always included some digital modules. David Rosenboom became one of Buchla's close collaborators, both in musical projects and in offering design suggestions and feedback as new hybrid digital-analog instruments were developed, like the Buchla 300 (also heard on this release in *And Out Come the Night Ears*). By the late 1970s digital technologies had developed enough that it became feasible for Buchla and Associates to make its first performance-oriented keyboard instrument using full-blown digital sound generation, the Touché, which was later followed by the more general-purpose Buchla 400. But Buchla's forte was always for technical and musical innovation, not business. So while the Touché preceded the release of other far more commercially successful digital keyboard instruments by a few years, only a few Touchés were ever made; they were essentially prototypes that never went into full production.

This transience that characterizes the history of electronic music instruments has been both its beauty and its curse. While composers have been inspired by the new musical experiences they offer, they have also struggled mightily to catch the genie in a bottle before it disappears. The fluidity of this medium is part of its attraction, but it works against a composer's efforts to develop repertoire that can continue to be performed. Like the sand that its silicon circuitry is made from, electronic music instruments slip through the fingers. Observing their development over the past century one asks, Are we simply at the beginning of a process that will eventually result in an instrument family, which eventually stabilizes? Or is this part of a technological process whose nature is to continue to change into the foreseeable future, evolving more like a virus than a species that reaches any stable form? Is it possible that musical instruments are by necessity physical objects, and that electronic instruments, being based on the physics of a microscopic scale, must necessarily evolve with a different relationship to human performers, which can never be in a fixed relationship to the manipulations of the human body? And if this is true, what will the future of this musical evolution really be? What happens to repertoire, and instrumental technique, when the instruments that are used to create new masterpieces are no longer produced within a few years of their invention?

David Rosenboom's work provides clues to answer these questions, and by considering them we can deepen our understanding of what he meant with the title *Future Travel*. His music models possible trajectories of our awareness and participation within evolutionary processes. The themes suggested by his titles, the words chanted in the dialectical poetics of his lyrics, the mathematics represented symbolically in the selection and interaction of musical materials, and the concepts stated explicitly in his theoretical writings⁷—all stress his interest in defining music precisely as a methodology for exploring the potentials of human, and post-human, evolution. He makes it clear that he sees the evolution of our species as transitioning into forms that expand beyond our own physical bodies, and that the collaboration of humans and electronic machines in music is both a metaphor, and a practice, for the conscious, and thus *intelligent* development of that evolution.

Future Travel is the last of a series of nine pieces collectively called *In the Beginning* realized between 1978 and 1981. Written for a variety of ensembles and media, including solo electronics, large and small ensembles, and even film/video, all use a compositional system based on a series of numerical ratios that are used to influence both micro and macro-structural form in each composition. From his introduction to the published scores Rosenboom writes,

All of the works focus . . . on the development of a unique harmonic, rhythmic and melodic language. This language takes inspiration from research on a model of proportional structures in music and on an evolving, topologically modeled theory of musical "shape" perception. There is programmatic content in the works which relates to human beings' propensity to attempt to double themselves in both religion and technology and which develops a scenario for the evolution of human consciousness toward the birth of a macroscopic Earth-organism to which all individual entities contribute. . . .

The *In the Beginning* system of proportions is used to construct cycles of growth and decay, resulting from the natural reinforcement of proportions with each other, moving toward maximum resonance and away from it. . . .

The composition mirrors nature in the creation of singularities, particles, or differentiated units of perception. It does this by making use of the idea of resonance as a key to creation within an initially smooth medium, like undifferentiated space or the undisturbed surface of a calm lake. Resonance represents the force of drawing together in patterned relationships which outline natural ontological evolution . . . the system of proportions articulates growth when interactions produce reinforcement and decay when they produce collisions.⁸

The entire record was created feverishly during a week-long session at Francis Ford Coppola's Zoetrope Studios in San Francisco, with Rosenboom performing all of the tracks, and collaborating with recording engineer Kathy Morton on the mixing and post-production. Rosenboom had already embedded this compositional system in a program written for the Buchla 300 synthesizer used in the solo electronics piece *In the Beginning IV*. For *Future Travel* he extended it to control the Touché as well, using its algorithms to generate bed-tracks of digitally synthesized sound that took full advantage of the new timbral capabilities of the instrument. The system of proportions can be recognized most readily in the rhythmic relationships within these textures, in the pitch structures of the arpeggiated chords, as well as in the harmonic progressions that map "cycles of growth and decay"—essentially, motion from complexity to simplicity and back—that govern the form of the pieces. Over these tracks he then overdubbed thick layers of improvised lines from the Touché keyboard, as well as with violin, piano, and several percussion instruments.

Future Travel is also a time capsule of musical styles. The record project was conceived in response to an invitation by Jose Cruz, a friend who was starting a popularly oriented record label in Detroit called Street Records. A couple of months after a wild party in Berkeley celebrating the launch of the Touché, Cruz visited Rosenboom, saw the new instrument in his studio, met some of his friends in the experimental music community, and "became impressed by how hard people in this world seem to work and how unswervingly dedicated we are to new ideas that push and struggle against the boundaries of acceptance by popular culture at large."⁹ Being already familiar with some of Rosenboom's music and enthralled by the possibilities of this futuristic instrument, Cruz offered him the opportunity to create a music that would package his experimental sounds in an accessible musical form.

Rosenboom is also a fully versatile musician, capable of playing and writing in any number of conventional styles. He notes that "by adopting an attitude that *stylistic imperatives are meaningless* [my emphasis] . . . (and) drawing from a wide range of cultural referents to be expressed in electronic orchestration and improvisation, I might be able to make an example of music that could cross over the divides of the many stratified and illusorily coagulated identities in the musical culture of that time."¹⁰ So while the surface of this music gleams with an early-eighties poppy brightness, underneath it embodies a synthesis of the formidable styles that Rosenboom cut his teeth on: minimalism (he played with LaMonte Young's Theater of Eternal Music band), stochastic music (as an acquaintance and admirer of Iannis Xenakis's formalized music), and a free improvising pianist (whose keyboard pyrotechnics married the dissonant fire of Cecil Taylor with the cyclical virtuosity of Terry Riley). Perhaps it also was meant to build on the improvised space-music legacies of Sun Ra ("space-is-the-place"), Alice Coltrane, and Parliament-Funkadelic. It was of course hoped that the record would find a much larger market than it did, but within a few years, Street Records was out of the business. And the *Future Travel* style has perhaps never been heard before or since: a fusion of jazz, rock, and experimental music in the service of futuristically philosophical themes.

Altogether, both style and technology reflect the idealism of their time, a utopian vision that was part of the *Zeitgeist* of the birth of the digital age in Silicon Valley. Rosenboom describes himself as "being susceptible . . . to occasional waves of intoxication with an unreasonably optimistic tendency to imagine a potential for the spirit of humanity to ascend on higher evolutionary pathways";¹¹ he was not alone in this proclivity during that era. It may be difficult to restore the feelings of creative awe that accompanied the activities of computer music experimenters in the Bay Area during the 1970s, but this music embodies that spirit. The Rosenboom-Buchla collaboration provides one of the best examples of technologists and musicians whose access to the newly developed microcomputers encouraged them to invent a different kind of musical future. Living that future today, we are surrounded by a proliferation of musical styles, both popular and experimental, that depend on an interactive relationship between musicians and their computerized music machines. Perhaps yet to be realized in that relationship is the elusive *intelligence* that Rosenboom foresaw as the ultimate purpose of this symbiosis, as so much of our musical present is still dominated by simplistic, one-way paradigms of information exchange. But even the ability to play sound, or to randomly access a sequence of musical events stored in a digital memory—these tasks that seem so normal today still produced a sense of wonder then that spilled over into rosy-hued visions about the possibilities of the future. New forms of collaboration, means of communication, and especially an accelerated evolution of ideas seemed to be promised by the advancing trajectory of technological progress. Looking back, it evokes a nostalgia for that innocence, along with a disappointment that the world has not changed in more significant ways. Or has it?

“*Future Travel* is a journey in sonic imagery. It is set sometime in the future and its starting point is Earth. The traveler, whose point of view we imagine, is a spirit being, representing the first awareness of a new form of consciousness to which humans have evolved. At an earlier point in the evolution of the Earth human beings had become aware of the unstoppable momentum of the course they had set and the unlikelihood of their surviving. Consequently, attention was turned towards learning to direct the process of their evolution to a new form. This form is a macroscopic one, a large-scale organism, to which all, individual entities of earlier Earthly forms contributed. The first awareness of this new form of existence is beginning now.”¹²

—Chris Brown

Chris Brown, composer, pianist, and electronic musician, is Co-Director of the Center for Contemporary Music at Mills College in Oakland, California. www.cbmuse.com.

Composer’s Note

“From the very beginning of my musical life, my interest in composition has been guided by intense wonderment that musical activity can admit an enormous range of investigations into human consciousness and knowledge. In music one can unfold the dynamics of human relationships and culture, investigate perception, represent philosophical systems, express emotions, embody systems of metaphor and cognition, symbolize dramas of history and evolution, and enact real models of nature and the cosmos. I love encountering forms that dynamically emerge and offer opportunities for audiences to become interactively immersed in their evolutionary trajectories. Enfolding aesthetic, philosophical, and artistic notions inside unfolding, somewhat unpredictable processes, with both visceral and intellectual results, that’s part of the goal.”¹

Both *Future Travel* and *And Out Come the Night Ears* exemplify these points of view. Both are, indeed, *emergent forms* of musical composition. Their genesis lies in the results of animating corresponding generative models, which when blended in imaginative applications brings forth myriad new forms.

One of the reasons I develop and use so-called *systems of composition* is not because I’m single-mindedly interested in abstraction, or because I’m looking to remove influences of personal choice to maintain a kind of purity of structure, but because if they are successful for me, they often lead to discovering new musical territory that I might not have found if I had relied solely on intuitive choice-making. In addition, these systems are often propositional models of universes made sonic that I seek to explore with musical binoculars or microscopes (*propositional music*). I often blend complex systems with spontaneity by imbedding these so-called systems inside the structures of what I, and some others, call *intelligent instruments*, and then play them on an interface between structure and improvisation.

In his insightful essay, Chris Brown has already made much of this explicit with reference to the world of experimental electronic music and *Future Travel* in particular. To create *Future Travel*, I freely played a generative system imbedded in software and hardware and being stimulated by the inspiration of musical discovery, allowed myself to fancifully orchestrate the emerging forms into hopefully transporting tunes, songs, and compositions, loosely organized by an underlying and subtly present narrative. Like the music, this narrative *emerged in the studio process*.

And Out Come the Night Ears is a solo for piano interfaced with an electronic system developed through a particular improvisation practice that manifests anew in each performance. Because this practice has an identity in my mind associated with specific piano exercises I composed for myself, certain musical materials, particular interactive electronics techniques, and a body of performances, I think of it as *a piece* that is *not a piece* and I call it *a piece*. The recording presented here is extracted from an approximately one-hour-long performance given in a concert that was coincident with the rollout of the then new Buchla 300 Electric Music Box. I sometimes think of the piano as if it was an orchestra, and in this rendition, the Buchla 300 provided a means of extending that orchestra. The piano’s frequency spectrum was partitioned into a set of narrow bands and applied to the electronic system’s analyzing inputs. In this way the dynamical characteristics of events emanating from separate areas of the keyboard could determine both the initiation of sounds and aspects of how they were generated, while always maintaining a direct relationship to the dynamics of performing actions. The piano was transformed into an ensemble that was structured somewhat like a band, with bass-like, percussion-like, and auxiliary instrument-like sounds. Everything heard that doesn’t sound like a piano is electronic. Playing in particular, defined ranges of the keyboard with certain dynamics initiated and controlled all the electronic sounds. It may also be worth noting that this was an analog circuit-driven process with no computer programming and no discrete digital control

except for the impulses that initiated sound envelopes or responded to threshold crossings. For me, the sometimes-fuzzy boundaries with which analog control areas are defined, warping a bit in response to dynamics, are an essential part of the instrument. The acoustic and control uncertainties are critical to the feeling of the process. This is particular and rich, a special kind of instrument.

The original liner notes accompanying the 1978 release, containing a somewhat different excerpting of *And Out Come the Night Ears*, included the following quote.

“There are two basic principles of musical structure I rely on. The first is expressed by the force of attraction, (gravity, love, concentration, creation), and the second lies in the idea of repetition, (materialization, duration). My mindfulness of this constitutes the only score. I find I must wait before the beginning of each performance until I am surprised by the first sound I make and the fact that it is made. Then, I feel ready to proceed.”

The process of composition can be for me, at least in part, a way to model an understanding of the evolution of *kosmos*. This necessarily involves a willful and motivated manipulation of the distinctness of separate entities, one from another, which, when one travels the path of increasing distinctness, demands skill in the facilitative technology of counterpoint and, when moving towards indistinctness, requires the control of fusion, clear insight into unity, and a vision of the wholeness of the universe. In my view, active creative listening is also composition, perhaps the most important kind. When the *night ears* come out—(no matter the *hour*)—, freed from obfuscation and open to pure listening, they remind us:

Order and disorder are mental constructions,
like consonance and dissonance;
the universe is a “pure land” through and through;
while our *per-capio* dancing around its *forms* may distress,
dances illuminating suchness engender peace—
unsupported thought—creative flight.

¹ Artist’s Statement, author’s Web site.

David Rosenboom (born 1947) is a composer, performer, interdisciplinary artist, conductor, author, and educator. Since the 1960s he has explored ideas about spontaneously emerging musical forms, languages for improvisation, new techniques in scoring for ensembles, cross-cultural collaborations, performance art, and multimedia, the interactive music of the infosphere, an approach to compositional modeling termed *propositional music*, and extended musical interface with the human nervous system. His work is widely published, recorded, distributed, and presented around the world, and he is known as a pioneer in American experimental music. Since 1990 he has been Dean of the School of Music at California Institute of the Arts, where he now holds the Richard Seaver Distinguished Chair in Music, and has also been a conductor with the New Century Players, co-director of the Center for Experiments in Art, Information and Technology, and a board member with the Center for New Performance. He has worked in numerous innovative institutions, including the Center for Creative and Performing Arts (SUNY Buffalo), Electric Circus (New York), Aesthetic Research Centre (Canada), the Banff Center, Simon Fraser University, San Francisco Art Institute, California College of Arts and Crafts, Bard College, and Ionian University (Greece). In the 1980s he held the Darius Milhaud Chair at Mills College, where he was also director of the Center for Contemporary Music, head of the music department, and a professor of music. In the 1970s he was a co-founder of the music department at York University (Toronto) where he became a professor of music and interdisciplinary studies. He studied at the University of Illinois in the 1960s with Salvatore Martirano, Lejaren Hiller, Kenneth Gaburo, Gordon Binkerd, Paul Rolland, Jack McKenzie, and Soulima Stravinsky, among others, where in 1995 he was awarded the George A. Miller Professorship in conjunction with a residency celebrating the centennial of the School of Music.

For further information, please visit: <http://music.calarts.edu/~david>

SELECTED DISCOGRAPHY

Bloodier, Mean Son. Daniel Rosenboom, trumpet. Includes *Zones of Coherence*, *Music for Unstable Circuits* (+ drums + trumpet). Ninewinds Records NWCD 0238.

Brainwave Music. EM Records 1054CD.

Chanteuse. Jacqueline Humbert, vocalist. Includes *Attunement* and *Oasis in the Air*. Lovely Music LCD 4001.

Invisible Gold: Classics of live electronic music involving extended musical interface with the human nervous system. Pogus Productions 21022-2.

Suitable for Framing. David Rosenboom, J.B. Floyd, pianos; Trichy Sankaran, South Indian percussion. Mutable Music, 17517-2.

Systems of Judgment. Centaur Records CDC 2077.

Two Lines. David Rosenboom, MIDI grand piano, HFG-influenced sampled piano; Anthony Braxton, saxophones, clarinet, and flute. Lovely Music LCD 3071.

Related titles on New World Records

Columbia-Princeton Electronic Music Center 1961–1973. New World Records 80521-2.

Kenneth Gaburo. *Five Works for Voices, Instruments, and Electronics*. New World Records 80585-2.

Gordon Mumma. *Electronic Music of Theatre and Public Activity*. New World Records 80632-2.

Pioneers of Electronic Music. New World Records 80644-2.

James Tenney. *Selected Works 1961–1969*. New World Records 80570-2.

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———. *Collapsing Distinctions: Interacting Within Fields of Intelligence on Interstellar Scales and Parallel Musical Models*. Santa Clarita, CA: David Rosenboom Publishing, 2003. Also available online at: <http://music.calarts.edu/~david/writings/books.html>

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Future Travel

The sounds of *Future Travel* were created primarily with Touché, a computerized keyboard instrument utilizing digital sound generation, expanded to also control a 300 Series Electric Music Box, both from Buchla & Associates. Musical computer programming was by David Rosenboom with Patch-IV and FOIL (*Far Out Instrument Language*).

Other instruments appear as follows:

Station Oaxaca: violin, pod rattles, Tibetan cymbals, and tambourine

Corona Dance: Syrian dumbek, ocarina, hand clapping, and African mbira

Palazzo: piano and Ghanaian gankoguis

Nova Wind: piano and violin

The original recording was made at Zoetrope Studios, San Francisco, 1981, with engineering and special electronic processing by Katherine Morton.

In *Station Oaxaca*, *Desert Night Touch Down*, and *Nova Wind*, Jacqueline Humbert reads texts by Rosenboom.

Special thanks go to Executive Producer Jose Cruz, from Street Records, whose crucial support at the right time made the creation of *Future Travel* possible along with its release on Street Records, SRA-002, 1981.

And Out Come the Night Ears

Instrumentation: piano and 300 Series Electric Music Box, from Buchla & Associates

An original, much longer, live recording was made by Robert Shumaker during a concert performance at 1750 Arch Street, Berkeley, California, in 1978. This CD contains selections taken from that recording. Different, though overlapping, selections were also released on 1750 Arch Records, S-1774, 1978, with the kind support of Thomas Buckner.

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BACK BOOKLET COVER:

DAVID ROSENBOOM (b. 1947)
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Future Travel (1981) 43:48

A journey in sonic imagery

1. Station Oaxaca	3:26
2. Time Arroyo	5:14
3. Corona Dance	4:10
4. Nazca Liftoff	2:20
5. Desert Night Touch Down	5:10
6. Palazzo	8:17
7. Nova Wind	14:59

David Rosenboom, Buchla Touché & 300 Series Electric Music Box, piano, violin, percussion, texts

8. *And Out Come the Night Ears* (1978) 28:13

David Rosenboom, piano and Buchla 300 Series Electric Music Box

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¹ David Rosenboom, *Future Travel*, liner notes, Street Records, 1981.

² James Tenney: *Selected Works 1961–1969*, New World Records 80570-2.

³ *HPSCHD*, CD, EMF Media, EM 138.

⁴ *Live Electronic Music*, CD, Tzadik 7074.

⁵ “Extended Musical Interface with the Human Nervous System,” *Leonardo Monograph No. 1, ISAST, International Society for the Arts, Sciences, and Technology*, Berkeley, CA, 1990; revised version (1997) available through Leonardo Electronic Almanac, Electronic Monographs.

⁶ “Lovely Little Records,” Lovely Music Ltd., LP 101–06.

⁷ “Propositional Music: On Emergent Properties in Morphogenesis and the Evolution of Music,” in Zorn, J. ed., *Arcana, Musicians on Music*, Granary Books/Hips Road, NY, 2000, pp. 203–232.

⁸ David Rosenboom, “IN THE BEGINNING: A Collection of Works 1978–81,” Descriptive Note, p. 1, Frog Peak Music, Ros01.

⁹ Rosenboom, private communication with Chris Brown, 2007.

¹⁰ Ibid.

¹¹ Ibid.

¹² David Rosenboom, *Future Travel*, liner notes, Street Records, 1981.