Events

Electroacoustic Evening, Belo Horizonte, Brazil

Fourth Meeting of Latin-American Composers and Performers, Belo Horizonte, Brazil, 25 May–1 June 2002

Reviewed by Carlos Palombini
Belo Horizonte, Brazil

The Fourth Meeting of Latin-American Composers and Performers (www.encontrocompositores.org.br) took place from Saturday, 25 May, to Saturday, 1 June 2002, in the Artistic Education Foundation (caleidoscopio.art.br/fundacao) of Belo Horizonte, Brazil, which held similar meetings in 1986, 1988, and 1992. Saturday morning, speeches by representatives of local, state, and national authorities opened the event—conjuring up images of the 1940s and 1950s, when the “great composer” was an important component of the state apparatus—to an audience of long- if receding-haired masters. In the evening, Teodomiro Goulart’s piece for 12 spinning guitars and twelve static performers triggered off a series of 18 concerts, showing that non-electroacoustic experimentalism is alive and well in the Southern Cone. Named Minasonora [SoundMine] but dubbed Os violocopteros [The Guitarcopters] by its players, the piece attracted a following of its own. Electroacoustic works by Dante Grella, Flo Menezes, Daniel Quaranta, Rodolfo Coelho de Souza, and Rogério Vasconcelos appeared amid non-electroacoustic pieces in subsequent programs. In addition, the early evening of Friday, 31 May, was entirely devoted to the art of electroacoustic composition.

The Foundation’s Sérgio Magnani Music Room is an acoustic jewel. Equipped with a set of four loudspeakers, however, it is hardly the ideal setting for an electroacoustic soirée. It is difficult to say anything about Sérgio Freire’s recent Quatro sketches em movimento [Four Sketches in Movement], for live percussion, prerecorded sounds, and real-time signal-processing, other than that it would have benefited from a dress rehearsal. The excellent percussionist, Fernando Rocha, performed as best he could but was eventually knocked out by not exactly the right sound coming in not exactly in the right place.

Ana Cláudia de Assis interpreted Eduardo Reck Miranda’s Grain Streams (2000), for piano, prerecorded sounds, and real-time signal-processing, taking advantage of the antagonism between a highly eclectic piano part—where major triads rub shoulders with Boulezian écritoire—and the sound morphologies of the processed material. Whether such dichotomies constituted the piece’s weakness or its strength was a matter of debate among the cognoscenti.

Maurício Loureiro presented Fernando Iazzetta’s Tangerina [Tangerine], for clarinet and real-time sound-processing. Using Max patches in a subtle, almost decorative, manner to enhance and amplify the instrument’s resources, Mr. Iazzetta hit a note with the majority of the audience, whether familiar with electroacoustic idioms or not.

Rodolfo Caesar provided a suitable climax with Ranap-Gaô (2001), for recorded sounds and a video by Simone Michelin. The Tupi-sounding name, an anagram for araponga, evokes the campanero or bell-bird of South America, whose unmusical calls, resembling the strokes of a hammer on an anvil, Mr. Caesar synthesized (a real araponga apparently having turned up at the composer’s window as soon as the piece was finished). In a similar way to the surreal images of Ms. Michelin’s video, Mr. Caesar’s sounds retained all their ambiguity, their nature—elektronische or concrète?—always a mystery. The audience responded with great excitement and only one doubt: “Will he be able to keep it up?” This he did, in great style. The compactness of the ambience and the flatness of the sound diffusion enhanced the impact of the piece.

The concert concluded with Neder José Nasarros’s 2000–2001 Concreto Armado [Reinforced Concrete] for soprano, sung by Doriana Mendes, and pre-recorded electronic sounds. Subjecting an instance of what has become known as concrete poetry (“the hammer hammers,” etc.) to a plethora of manipulations, Mr. Nasarros engendered a sense of high modernist malaise in whose presence no one booed.

Youthful, knowledgeable, and warm, the audience was a highlight and packed the 200-seat room beyond capacity on a daily basis. Passing on knowledge of and taste for contemporary music to the new generations of the Minas Gerais state has been the charge of Berenice Menegale, the contemporary music education coordinator. On 25 May, the Audiences hit a note with the majority of the audience, whether familiar with electroacoustic idioms or not.

Rodolfo Caesar provided a suitable climax with Ranap-Gaô (2001), for recorded sounds and a video by Simone Michelin. The Tupi-sounding name, an anagram for araponga, evokes the campanero or bell-bird of South America, whose unmusical calls, resembling the strokes of a hammer on an anvil, Mr. Caesar synthesized (a real araponga apparently having turned up at the composer’s window as soon as the piece was finished). In a similar way to the surreal images of Ms. Michelin’s video, Mr. Caesar’s sounds retained all their ambiguity, their nature—elektronische or concrète?—always a mystery. The audience responded with great excitement and only one doubt: “Will he be able to keep it up?” This he did, in great style. The compactness of the ambience and the flatness of the sound diffusion enhanced the impact of the piece.

The concert concluded with Neder José Nasarros’s 2000–2001 Concreto Armado [Reinforced Concrete] for soprano, sung by Doriana Mendes, and pre-recorded electronic sounds. Subjecting an instance of what has become known as concrete poetry (“the hammer hammers,” etc.) to a plethora of manipulations, Mr. Nasarros engendered a sense of high modernist malaise in whose presence no one booed.

Youthful, knowledgeable, and warm, the audience was a highlight and packed the 200-seat room beyond capacity on a daily basis. Passing on knowledge of and taste for contemporary music to the new generations of the Minas Gerais state has been the charge of Berenice Menegale, the contemporary music education coordinator. On 25 May, the audience hit a note with the majority of the audience, whether familiar with electroacoustic idioms or not.

Rodolfo Caesar provided a suitable climax with Ranap-Gaô (2001), for recorded sounds and a video by Simone Michelin. The Tupi-sounding name, an anagram for araponga, evokes the campanero or bell-bird of South America, whose unmusical calls, resembling the strokes of a hammer on an anvil, Mr. Caesar synthesized (a real araponga apparently having turned up at the composer’s window as soon as the piece was finished). In a similar way to the surreal images of Ms. Michelin’s video, Mr. Caesar’s sounds retained all their ambiguity, their nature—elektronische or concrète?—always a mystery. The audience responded with great excitement and only one doubt: “Will he be able to keep it up?” This he did, in great style. The compactness of the ambience and the flatness of the sound diffusion enhanced the impact of the piece.

The concert concluded with Neder José Nasarros’s 2000–2001 Concreto Armado [Reinforced Concrete] for soprano, sung by Doriana Mendes, and pre-recorded electronic sounds. Subjecting an instance of what has become known as concrete poetry (“the hammer hammers,” etc.) to a plethora of manipulations, Mr. Nasarros engendered a sense of high modernist malaise in whose presence no one booed.

Youthful, knowledgeable, and warm, the audience was a highlight and packed the 200-seat room beyond capacity on a daily basis. Passing on knowledge of and taste for contemporary music to the new generations of the Minas Gerais state has been the charge of Berenice Menegale, the contemporary music education coordinator. On 25 May, the audience hit a note with the majority of the audience, whether familiar with electroacoustic idioms or not.
International Conference on Auditory Display 2002

Advanced Telecommunications Research Institute, Kyoto, Japan, 2–5 July 2002

Reviewed by Bob L. Sturm
Santa Barbara, California, USA

The latest edition of the International Conference on Auditory Display, ICAD2002 (www.icad.org or www.mic.atr.co.jp/icad2002/page/welcome.html), was held at the Advanced Telecommunications Research [ATR] Institute in Kyoto, Japan on July 2–5. This conference brings together a variety of professionals, researchers, and students in fields such as sonification, data visualization, auditory perception, human computer interaction [HCI], virtual acoustic environments [VAE], as well as a few interdisciplinary artists. This year’s presenters came from Europe, Australia, Japan, and the USA, and a few from Canada and Singapore. In addition to the academic presence, there were several participants from professional sectors: Nokia, France Telecom Research & Development, Minolta, Canon, Matshita Communication, NASA Ames Research Center, Rockwell Scientific, as well as the United States Naval and Air Force Research Laboratories. The corporate presence signifies the growing interest in, and applicability of, auditory display techniques for commercial products such as cellular phones and digital cameras, as well as ongoing work in virtual reality and data-set visualization.

Auditory display [AD] is the use of sound to communicate between machine and human, and to explore and understand one’s environment. Some examples are the Geiger counter, computer error beeps, crosswalks for the blind, and hospital vital sign monitors. More complex examples are SONAR, sonification of multidimensional data-sets, and complex military simulations. AD can provide an eyes-free and non-intrusive medium to communicate essential information about a situation. For example, in the operating room, eyes should be devoted to the procedure and not distracted by having to watch a record of a patient’s vital signs.

ICAD2002 was significant in that it marked the ten-year anniversary of its inception at the Santa Fe Institute [SFI]. Gregory Kramer, who conceived and helped organize the first ICAD in 1992, gave the keynote address in Kyoto. He talked about the history of ICAD and how its legitimacy was established by two key publications: the proceedings of the first conference published by SFI in 1994 [Kramer, G., ed. Auditory Display: Sonification, Audification, and Auditory Interfaces. Santa Fe Institute Studies in the Sciences of Complexity, Proc. Vol. XVIII. Reading, Massachusetts: Addison-Wesley, 1994], and a report funded by the National Science Foundation [USA] on the field and status of AD [Kramer, G., B. Walker, et al. 1999. Sonification Report: Status of the Field and Research Agenda, ICAD, Santa Fe; online at www.icad.org]. Mr. Kramer talked at length about the multidisciplinary nature of AD, emphasizing that its successful application requires knowledge of sound, psychoacoustics, audio programming, and HCI. This makes a conference such as ICAD to be “both focused and open,” allowing for a mixed interplay of disciplines and participants. Mr. Kramer’s address was also focused and open when he invited on the spot several participants to speak who have been instrumental in ICAD’s continual success.

Elizabeth Wenzel, who researches spatial hearing at NASA Ames Research Center in California, was essential in organizing the first ICAD, and continues to actively participate. The current ICAD president, Eric Somers, talked about how he became involved through his sound-art work. Stephen Barrass and Bruce Walker were both asked to discuss how ICAD added legitimacy to their doctoral research, which is entirely devoted to AD. Matti Gröhn, multimodal virtual reality researcher at Helsinki University, Finland, attended every ICAD and remarked on its progress. These participants demonstrate the wide base of disciplines that have been and continue to be active in this international research community.

During the four days of the conference there were five tutorials, several paper and poster presentations, two demonstrations, a multimedia installation, a brief concert, and the traditional open-microphone session. One was able to attend everything since ICAD is a single-track conference.

The first day was devoted to five tutorials, but only two of them fit that function. Simon Carlile, from the University of Sydney, Australia, presented a useful overview of auditory dimensions. He talked in detail about the sensitivity of our ears and the benefits and detriments of each aural dimension, such as pitch, loudness, and auditory streaming. William Martens, from the University of Aizu, Japan, presented a nice review of current work in spatial AD. Most insightfully, he addressed the tension between the developers who want demos and the scientists who want data.

Paper and poster topics included: sonification techniques, sound as navigational aids in cellular phones, auditory perception in three dimen-
sions, VAEs, and experimental results in auditory perception. One interesting idea was customizable Head Related Transfer Functions (HRTFs), whereby only a few parameters of a generic HRTF can be changed to suit any user. One paper demonstrated the inability of sighted listeners to accurately estimate the distance of a sound source greater than one meter away. Though it had little to do with sonification, one paper presented a tool that reduces an audio signal to a MIDI approximation. Most memorable was the transformation of speech into MIDI marimba. This software has compositional curiosity, but is only available for Japanese Windows-based computers (www.dcaj.or.jp).

Most of the papers and posters were excellent, but quite a few were redundant or had little to do with AD. Had these been eliminated some posters could have become papers, and more time could have been spent going through the posters. One poster that should have been a paper was the work of Thomas Hermann et al., who are creating novel techniques for exploratory data analysis using acoustic data representations. One such technique involves virtually placing a multidimensional data-set into a haptic device that resembles a potato with buttons. Shaking, twisting, squeezing, and hammering the device makes the data-set react and create sounds that provide insight into the data.

Only two demos were presented, even though they were a bit under-advertised. The first was of a hypersonic sound system that produces frequencies from 20 Hz to 100 kHz. In a soundproof room, they played a soundtrack of the Japanese animation movie Akira that was recorded at a sampling rate of 3.072 MHz. Their research argues that while humans cannot hear above 20 kHz, higher frequencies affect the regional blood flow in and around the brain. This creates a measurable positive effect that they term the “hypersonic effect.” Unfortunately, there was no standard sound system there with which to make a comparison.

The other demo was of the Sound Lab (SLAB), developed at the NASA Ames Laboratory, which creates a dynamic VAE that responds to listener position. The demo consisted of a laptop and headphones equipped with the small Polhemus Fastrak electromagnetic tracking sensor. The VAE had a man and a woman speaking in a room, and each voice could be positioned and made to travel different trajectories. There was a realistic difference when the source was either moving in front of or behind my virtual head. In an “off-ICAD” presentation by Joel Miller, the programmer of SLAB, I auditioned two of his compositions that impressively use SLAB and binaural recording. This software is developed for PC computers running Windows 98 and 2000, and is now available for free from human-factors.arc.nasa.gov/SLAB.

In addition to the demos, there was a multimedia installation entitled Acoustic Acclimation by Coscilia (Lulu Ong and Damien Lock, Singapore). Within a quadraphonic loudspeaker array was a complex handmade controller with a large spinning potentiometer, four slide controllers, and a button. On the projection screen in front of this was an inviting though confusing graphical user interface. The visuals were 360-degree still shots of environments from Singapore, such as a reservoir, a beach, or a neighborhood. The sounds were all recorded on location and could be altered, mixed, and panned through Max in response to the user’s controls. Rotating the potentiometer makes the visuals and sounds pan in the same direction. Each of the four sound layers could be faded with slide controllers. Even though this installation had little to do with aesthetic uses of sonification, it inspired thinking about the sense of meaning contained in an AD, and provided a comfortable escape from the conference.

The concert was short and provided a limited but pleasant experience of traditional and modern Japanese music for two kotos and one shakuhachi. There was also a piece for solo cyber-shakuhachi, which senses the movement of the performer’s head, shoulders, fingerling, and the sound of the instrument. This was rather like the usual sort of piece for such an instrument, demonstrating every sensitive feature over a long period of time. But the piece did have its moments of beauty and insight.

At ICAD2002 there was certainly more focus on data rather than demos. Too few presenters used the room’s sound system to demonstrate their research. In his keynote speech Mr. Kramer said that there has been a significant under-representation at ICAD of those who are actually synthesizing sound, and even more so of people who intimately know how to work with sound, such as musicians and composers. Of 68 papers and posters this year, I counted only eight that deal with synthesizing sound from data. Two of these papers touched upon the artistic use of sonification.

In response to this artistic dearth, ICAD2002 Secretary Rodney Berry reserved a part of the open-mic session to the few artists in attendance. The open mic is generally a time to give critiques and suggestions, as well as to advertise upcoming events. Computer programmer/artist Alan Dorin discussed his LIQUIPRISM, a work for video and MIDI sound gen-

**Events**

85
erated by cellular automata. Composer Eric Somers discussed his use of polyphonic spoken text in a recent piece informed by the “cocktail party effect.” Composer/scientist Bob L. Sturm presented his 4-min composition Torrey Pines: 200110-200112, a sonification of the inner and outer buoy data at Torrey Pines State Beach, La Jolla, California. There are ongoing discussions that future conferences should incorporate more artistic content, for instance a curated concert of compositions that utilize sonification and AD techniques.

Overall, ICAD2002 was a successful and informative event in an inviting and historical locale. ATR, the Kansai Technology Park, and the research occurring there are impressive, and the people there were very welcoming. Congratulations to Chair Ryohei Nakatsu and his wonderful team for making ICAD2002 a successful and memorable event.

ICAD2003 (www.cns.bu.edu/~ICAD2003) will be held in Boston, sponsored by the Boston University Hearing Research Center, chaired by Professor Barbara Shinn-Cunningham.

Publications

Brandon LaBelle and Christof Migone, Editors: Writing Aloud—The Sonics of Language

Softcover, 2001, ISBN 0-9655570-3-0, 279 pages, illustrated, CD-Audio, US$ 20.00, Errant Bodies Press, Los Angeles, California 90093, USA; Ground Fault Recordings, P.O. Box 4923, Downey, California 90241, USA; electronic mail mail@groundfault.net; Web www.groundfault.net/. Distributed by Distributed Art Publishers, Inc., 155 Sixth Avenue, 2nd Floor, New York, New York 10013, USA; telephone (+1) 212-627-1999; fax (+1) 212-627-9484; Web www.artbook.com.

Reviewed by John Dack
London, England, UK

Writing Aloud—The Sonics of Language addresses many issues which must be considered in any serious investigation of the expressive powers of language. For example, the self-reflexive nature of language inevitably creates problems for anyone attempting to write about it. We are forced to ask: what type of language is appropriate or adequate when describing and examining the structures of language itself? This kind of problem was, of course, a preoccupation for many poets in the late 19th century. All attempts to establish exact correspondences between concepts or objects in the world and the words used to denote them were unsuccessful. The webs of private meanings that surround each word prevent any precise mapping from author to reader. The result has been the proliferation of literary theories emphasizing the demise of authorial intention.

Language imposes its own structures, and subtexts are produced over which writers have little, if any, control. All attempts to analyze a text and fix its meaning (or meanings) simply produces another text which can in turn be subjected to analysis resulting in another text . . . and so on. So, is there an alternative? In fact, does this resistance to stability create the very tensions that artists can exploit?

No book can investigate all the ramifications of these problems but this extremely interesting publication examines language by a combination of scholarly work with reflections by practitioners in addition to presenting actual art works. Writing Aloud reasserts the concrete nature of the sounds of language and explores some of their relationships with the written forms of language. Thus, the “primacy” of the spoken word (or, strictly speaking, the “articulated utterance,” given that several authors are concerned with extended forms of vocal communication) begins once again to occupy the central position in the work of many artists and writers using language as their principal medium.

Furthermore, the inclusion of a compact disc containing audio works by several of the authors in addition to other artists such as Michel Chion and Vito Acconci is an inspired strategy. The inexpensive nature of CD recordings now makes the dual presentation of text and sound a feasible proposition for many publishers. A well-known example is the CD provided in the reissued version of Charles Rosen’s book Sonata Forms. Mr. Rosen’s performances of Beethoven’s sonatas Op. 106 and Op. 110 illustrate his intelligent commentaries on a musical form which resists simplistic description. The recording itself emphasizes the problem which analysis cannot avoid: what is the relationship between the notation and the actual concrete musical realization. Do we analyze the score or a
performance! Where precisely does the musical meaning reside?

In Writing Aloud, the mere inclusion of two media—the written page and the audio CD—by editors Brandon LaBelle and Christof Migone prompts the sorts of questions that should concern us all. It could be argued that when books such as this deal with interdisciplinary approaches the use of a CD is practically indispensable. Thus, the catalogue of Sonic Boom (an exhibition held two years ago in London exploring the use of sound in art) and the book Sight of Sound: Of Architecture and the Ear (another excellent publication by Errant Bodies Press, co-edited by Mr. LaBelle and Steve Roden) would be difficult to imagine without their accompanying discs. I have recently purchased books on the history of media art and forms of narrativity in film and video, both of which include indispensable CD-ROMs. Extending the traditional medium of print for scholarly discussion and interpretation is, therefore, a welcome supplement to the way academics communicate their ideas.

The editors wisely chose not to produce a book consisting only of academic essays. Consequently, there is a wide variety of contributions ranging from authoritative articles on subjects such as sound poetry, interviews with both Robert Ashley and Alvin Lucier, to a poetic “mediation” on the music of Michel Chion, as well as writings by practitioners on their own works. The mix of scholarly articles, original artworks, and commentaries on the audio works is impressive. Nicholas Zurbrugg, for example, relates the work of sound poets Haraldo de Campos and Henri Chopin to contemporary multimedia artists like Stelarc. Mr. Zurbrugg asserts that the experiments of such sound poets were not merely typographic; they were also rooted in experimental performance practice which in turn relied on technology. The connection between what at first might seem a purely literary preoccupation with words and the use of technology in performance is clarified by such analyses.

Bart Plantenga’s chapter, “Yodeling to Rouse the Echoes,” is a witty and informative account of this vocal art and manages to achieve the impossible; he actually made me want to listen to yodeling. I confess during all my previous encounters with yodeling—usually “traditional” folk music in southern Germany—I felt the will to live rapidly ebb away. This despair was only numbed by drinking copious amounts of strong German beer rendering me incapable of differentiating any external stimuli at all. Mr. Plantenga’s enthusiastic style of writing demonstrates even to a sceptic like me that there is more to this vocal art than I could ever imagine.

Mr. LaBelle’s contribution deals with the important issues of identifying language’s own agenda—its own “laws” and predispositions which exist independently of any attempts to fix them. He celebrates the sheer physicality of sounds and investigates the potential for exploring their “interior” life. Drawing on Roland Barthes (the phrase “writing aloud” originates in his book The Pleasure of the Text), Mr. LaBelle correctly considers the wider social implications of speech acts which contrast to the “tiny pleasure zone of private reading.”

With chapters by others such as Christof Migone, Sean Cubitt, and Vincent Barras, Writing Aloud provides much thoughtful and stimulating material. Three texts by David Dunn, Gregory Whitehead, and Joceylyn Robert are particularly interesting. They supplement their audio works on the CD and can be followed like musical scores. In this way the subtle relationship between the written word and a time-based realization is illustrated. Another noteworthy example is the track by Vico Acconci. Although it originates in an installation, Mr. Acconci’s piece can be heard as an evocative sound work in its own right.

What, then, is the relevance of this book for computer musicians? Other than the fact that spoken language constitutes potential source material for composition, is there any connection between writers (in the broadest sense) and musicians? I believe there is. As the editors successfully demonstrate, there is a vast range of work being created by artists using language and the voice as their chosen medium of expression. Inevitably much of this work will overlap with musicians (Lionel Marchetti’s chapter on the French electroacoustic composer Michel Chion is an obvious example, as is Douglas Simon’s interview with Alvin Lucier). In addition, many practitioners are experimenting with technology as an additional resource for extending the expressive powers of language. Mr. Zeebrugg, for example, remarks on the fact that the “machine poetry” of Brion Gysin made use of three tape recorders. By contrast, he also acknowledges that other writers such as William Burroughs and Haraldo de Campos did not find technology and its potential for cyberculture their “natural” mode of working.

Even a brief glance at the biographies of the contributors reveals the interdisciplinary nature of their work. It is obvious that for these artists one discipline informs and influences another. This is, surely, a situation with which all computer musicians must be familiar. Many
composers are willing to describe themselves as “sound artists.” Furthermore, many are involved with art forms such as installations, which refer to Fine Art practices as much as to music. The medium of recording—whether analog or digital—has ensured that any sound has potential for inclusion in a musical context. Moving sounds in space will be informed by dance, theatre, and architecture. All this indicates that for anyone involved with computers and music a clear distinction between art forms is virtually impossible to identify. Thus, this book indicates that practitioners are crossing boundaries in their search for innovative means of expression by reasserting the sound and physicality of language and by the intelligent application of technology. We, as musicians, cannot [and usually do not] ignore their efforts. This book offers a number of different and stimulating viewpoints to these challenging areas.

In conclusion, I found the design and typeface of *Writing Aloud* pleasing to the eye. While this might seem a relatively trivial point, it is, I believe, relevant. With the aforementioned expansion of media by which information can be exchanged, the “book” can sometimes seem under threat (though its demise is often predicted it has not yet happened—I’m pleased to say!). One aspect of books which can still generate aesthetic appeal is the look and feel of the object itself, as well as the layout of the typefaces and their design. The weight and shape of a book, the physical feel and rustle of pages as we flick through, cannot be reproduced on a computer monitor. In this respect Christof Migone, Brandon LaBelle, and the designer Petra Michel must be congratulated.

**Curtis Roads: Microsound**

Hardcover, 2002, ISBN 0-262-18215-7, 409 pages, illustrated, references, appendices, name index, subject index, audio CD, US$ 47.95; The MIT Press, Five Cambridge Center, Cambridge, Massachusetts 02142-1493, USA; telephone (+1) 800-356-0343; electronic mail mitpress-order@mit.edu; Web mitpress.mit.edu/.

Reviewed by Margaret Schedel Covington, Kentucky, USA

As a confessed bibliophile, the first thing that struck me about Curtis Roads’s *Microsound* was simply its appearance. The slightly squarish proportions and abstract cover design set it apart from most computer music texts. Luckily, the contents live up to the expectations generated by its striking physical exterior. This is a valuable resource for anyone interested in the realm of quantum acoustics.

*Microsound* may surprise some readers expecting a companion volume on granular synthesis to the author’s earlier text, *The Computer Music Tutorial*. This new book is much more personal and subjective, concentrating heavily on Mr. Roads’s own research and compositions using sound particles. The secret to understanding the tenor of *Microsound* lies in the Acknowledgments section. This publication derives from Mr. Roads’s 1999 doctoral thesis, “Synthèse et Transformations des Microns.”

Just after the Acknowledgments is a nice overview of the nine chapters that constitute *Microsound*. In the first couple of chapters, Mr. Roads takes the reader on a journey through the history of time structures in music, leading to the history of “microsound,” which he defines as a broad class of sounds that extends from the threshold of timbre perception up to the duration of short sound objects spanning the boundary between the audio frequency range and the infrasonic frequency range. The middle chapters deal directly with sound particles, discussing the different types and their possible transformations. The later chapters are more personal, covering compositional applications, aesthetics of composing with microsound, and a commentary on the future. Occasionally Mr. Roads jumps around from mathematical and historical facts to personal opinion rather quickly, and as a result some of his beliefs are presented without an adequate qualifier, but he usually keeps these two worlds separated.

Chapter 1 reminds me of the visualizations that start off with a view of the universe and zoom in closer and closer—galaxy, solar system, earth, city, house, person—until a single strand of DNA fills the screen. Mr. Roads travels through time scales in a similar fashion, zooming from the infinite to infinitesimal in nine steps. He places Microsound at
the sixth level between Sound Object and Sampled Sound. This chapter is useful because it helps contextualize where exactly microsounds lie in the time domain. It is very easy to say that sound particles last between 1 and 100 msec, but relating this length to other units of perception places the subject of this book in a nice framework.

Chapters 2 and 3 are a wonderful blend of history and mathematics sprinkled liberally with relevant quotes from expected sources such as Henry Cowell, Karlheinz Stockhausen, and Iannis Xenakis, but also from philosophers, poets, and physicists such as Titus Lucretius, Margaret Cavendish, and Stephen Hawking. These two chapters offer a comprehensive overview of the development and implementation of granular synthesis. Mr. Roads feels that these chapters prepare the reader to understand concepts presented later in the book, but I think they give the computer music community a resource it has been sorely lacking—namely, a single, well-documented source for the composer or researcher who wants to begin working with sound particles.

For people already familiar with the basic ideas and techniques of granular synthesis, chapters 4 and 5 are the heart of this book. Here Mr. Roads explains the different types of particles, including glissons, grainlets, pulsars, and trainlets. Table 4.4 on page 177 is a well-organized reference detailing the envelope type, waveform, and characteristics of each of the grain types discussed in the chapter. Chapter 5 nicely explains the synthesis and transformation of microsounds, without the use of windowed spectrum analysis. Chapter 6 covers more documented topics including short-time Fourier Transforms, phase vocoding, and an introduction to the Gabor transform. This revises and updates material already covered in The Computer Music Tutorial, but the author justifies their inclusion in this text because “windowing is akin to synchronous granulation.” The author not only gives technical explanations of the transformations (windowed and non-windowed), he also gives descriptions of the resultant sounds; this is very useful for a composer who is more interested in the sonic result of a transformation rather than the mathematical process. The enclosed compact disc has examples of straightforward particle synthesis that clearly illustrate the types of grains and their transformations as well as excerpts from ten compositions.

The final chapters constitute the more personal and subjective section of the book. Here Mr. Roads discusses the uses of microsound in composition—focusing mainly on his own works, the aesthetics of composing with sound particles, and what he thinks the future of this field will be. I found chapter 7 to be unfulfilling, the pieces Mr. Roads writes about are all worthy of study, but I felt his descriptions fall between a catalog synopsis and a true theoretical analysis. As a composer, I would be better served by either a fully realized exploration of technical and aesthetic implications, or a simple list of salient works with a short listening guide. Chapter 8 repeats some of the points found in earlier chapters, but is still valuable for commencing a discourse on aesthetics, a topic too often overlooked by the computer music community. Chapter 9 contains musings on the future of microsound and is a mere two-and-a-half pages long, it feels brief. Mr. Roads is an eloquent writer with a far-reaching understanding of the history, mathematics, and possibilities of microsounds; I would have been very interested in a more thorough exposition of his ideas about the potential directions of this new frontier in music.

Microsound should appeal to composers and theorists alike; it seamlessly blends all aspects of quantum acoustics from history and mathematical theory through compositional practice and aesthetics, rewarding the reader with wonderful quotes, programming hints, and compositional inspiration.

Robert Rowe: Machine Musicianship

Hardcover, 2001, ISBN 0-262-18206-8, 399 pages, illustrated, references, index, hybrid CD-ROM/CD-Audio, US$ 47.95; The MIT Press, Five Cambridge Center, Cambridge, Massachusetts 02142-1493, USA; telephone (+1) 800-356-0343; electronic mail mitpress-order@mit.edu; Web mitpress.mit.edu/

Reviewed by Steven M. Miller Santa Fe, New Mexico, USA

As the author Robert Rowe states in the first paragraph of the first chapter, “Machine Musicianship is both an exploration of the theoretical foundations of analyzing, performing, and composing music with computers, and a tutorial in writing software to pursue these goals.” As such, it proceeds simultaneously, and largely seamlessly, as an overview of fundamental concepts and issues in music analysis, composition and performance, a programming tutorial with example implementations in both C++ and Max, a review of related research literature, and a survey of compositional uses of interactive
techniques. As fundamental concepts of musicianship are introduced, they typically are directly encapsulated into general algorithms and then into C++ code and working example applications. In many cases, fragments of Max patches are used as examples, as well.

Organized into ten chapters, Machine Musicianship groups its materials under cognitive, technical, and musical rubrics. Chapter 1 lays out the motivations behind creating software that incorporates detailed knowledge and “understanding” of traditional music theory and practice. It then briefly introduces the general concepts of algorithmic composition and analysis, including pointing out ways that these tasks can be aided by software which encapsulates and draws upon basic knowledge of musicianship—materials, relationships, and context. Following this is a brief overview of the remaining text, and an introduction to the “Machine Musicianship Library” of C++ source code. This library, included on the accompanying cross-platform hybrid CD-ROM/CD-Audio, is an extensive set of base classes that the author has used to implement the working example applications included on the CD-ROM. As source code, these classes are fully user-extensible and modifiable.

C++ programmers should find this a valuable resource with which to pursue their own projects. Unfortunately, Max programmers are not so well provided for; no attempt has been made to implement these base classes as Max objects.

Chapters 2, 3, and 4 present materials organized around the cognitive concepts of symbolic processes, sub-symbolic processes, and segments and patterns, respectively. The focus in these chapters is on developing software implementations of the concepts and techniques of traditional music analysis. Defining symbolic processes as those that are “based on representations of objects and relationships and manipulations of those representations according to some set of rules,” chapter 2 introduces several general techniques for algorithmic analysis and composition, and a number that focus specifically on the handling of pitch (of the “standard” 12-tone equal tempered variety, not frequency per se). Chord theory, in terms of classifying, representing, recognizing, and spelling triads [here taken to mean any three-note chord], and by extension individual pitch classes and sets, independent of context, is covered in detail, followed by the introduction of context sensitivity to determine both “missing pitches” and chord type [major or minor]. From there, induction of key for a specified passage is considered and several techniques for carrying this out are examined in detail. The final section of the chapter introduces the C++ base classes of the “Machine Musicianship Library” that are at the core of the working examples in the text.

In doing so, concepts of object orientation are briefly introduced, and the underlying details of implementing the musical concepts and issues are established.

Chapter 3 introduces a number of sub-symbolic processes, here defined as processes that “learn their behavior from exposure to material . . . this learning engenders models that do not rely on a fixed set of rules.” In other words, through training, they learn to map states of inputs to desired output states, and can then recognize and successfully handle novel inputs and arrive at desired outcomes without reliance upon explicit rules or procedures. The classic example of this sort of sub-symbolic process is the neural network. The first section of the chapter introduces the general concept and theoretical underpinnings of neural networks, and then discusses an implementation of a neural network for key induction. In doing so, it also introduces the concept of a “sequential neural network” which—freed from the usual restrictions in neural networks of requiring simultaneous inputs for parallel processing through the use of feedback paths—is able to induce key over a passage of music in real-time. Following this, the chapter shifts to the recognition and integration of time structures and rhythm, furthering the goal of context sensitivity in modeling human musicianship skills and tasks. Quantization of time, beat tracking through multiple attractors, adaptive oscillators, and meter induction are covered in detail. The chapter ends.
with a section detailing the process of recasting C++ objects, classes, and code into Max externals, allowing C++ programmers to directly and efficiently implement the concepts and examples discussed in the text in Max.

The first two sections of chapter 4 deal with the cognitive concepts of segmentation of the input stream into perceptually meaningful units and identification and processing of patterns. As before, the cognitive concepts are directly demonstrated in algorithms and working example applications. Chapter subheadings include Grouping Preference Rules, Gestalt Segmentation, Dynamic Processing, Intercognitive Representation, Segmentation and Matching, and Pattern Processors. The third section of the chapter introduces auditory models and details the processes of dealing directly with auditory input in the form of digitized audio rather than through the generalized representation of music in the form of notes inherent in the MIDI protocol. One of the techniques covered for doing so is the self-organizing map, which, unlike a neural network, uses unsupervised learning, also referred to as competitive learning, to train itself to produce the desired outcomes.

Chapters 5 and 6 focus on the technical issues of algorithmic composition and performance, namely, generating musical materials, largely in conjunction with or in response to the analytical information gleaned through the techniques of the previous chapters. This completes the "machine musicianship" model of awareness and response to musical materials. It also lays the groundwork for interactive music systems that exhibit some degree of musical knowledge and sophistication. A number of "real world" examples of compositions and performance and improvisation systems are covered in order to illustrate the topics at hand.

The overall organization of the book is clear and logical. It builds upon itself in a way that introduces complex concepts and relationships in an orderly fashion, one step at a time. From simple examples, more complex and "useable" algorithms are developed. Concrete programming examples for each concept are introduced which illustrate actual uses in composition, performance, and analysis. Extremely useful is the inclusion of the disc with example applications, C++ source code, Max patches, audio examples, video examples, and so on. It is extensive and covers all of the major areas of the text. In the sections on composition, the text cites and examines numerous actual compositional examples by the author and others. Again, this clearly illustrates actual uses of the concepts and algorithms. Along the way, the text brings together fields such as artificial intelligence, music cognition, and computer science with music theory, performance, and composition.

One major weakness of the text is a near total focus on traditional music and theoretical concepts. No attempt is made to demonstrate the applicability of the term "musicianship" beyond traditional concepts. The ideas and techniques are predominantly framed in terms of more or less traditional concepts of melody, harmony, and rhythm, making it largely inapplicable to music that does not exploit discrete pitch (notes, chords), pitch grids (scales, keys), and discrete, quantizable rhythms. Though it serves these rather limited areas quite well, the universe of computer music and interactive performance is clearly much more vast than this text lets on. Inclusion of more material on algorithmic control of synthesis, signal processing, spatialization, and mixing in response to external stimuli would greatly expand the applicability of the text. Even the small section in chapter 5 that deals with the use of Fast Fourier Transform techniques focuses on pitch detection in order to map detected pitches onto the range of MIDI Note numbers. No attempt is made to demonstrate, or even broach, either non-discrete pitch content, or timbral analysis. Although several mentions are made of pieces and/or composers who have gone into these areas, no specific information or techniques are forthcoming.

Another weakness is that the enclosed disc feels rather like an afterthought. It could have been much more thoroughly integrated with the text. For instance: there is no index of its contents in the book, the Index.html file on the CD-ROM lists contents by order of appearance in the text only, leaving an alphabetical index out altogether; there is no separate track-by-track index of the CD-Audio in the Index.html file, which means you have to wade through the CD-ROM contents to find out what's on the audio portion of the disc; there is no index/explanation/Read Me file at all concerning the Max patches on the CD-ROM (which correspond to Max patches in the text, for the most part). All in all, what could have been an excellent and integrated resource to make the material just that much more user friendly has been made needlessly hard to navigate and less than totally useful in its present form.

A final weakness is that not all programming examples in the text are included as Max patches either in the text or on the CD-ROM; many appear only as C++ examples. And,
as stated above, the C++ base classes of the “Machine Musician-ship Library” at the heart of the author’s implementation are not translated into Max objects. Those not conversant with C++ are in many ways left out of the loop entirely [no pun intended].

Overall, while somewhat narrow in scope in terms of “musicianship,” this text by Mr. Rowe does an admirable job of covering the concepts and techniques included. The inclusion of the CD-ROM, despite several serious flaws, is a much-appreciated feature. The writing is clear and readable; the structural organization is logical and easy to follow. Although the book doesn’t break any new ground or extend any of the basic assumptions of musicianship or computer applications in music, it does a good job of covering the issues of the field and collecting them together into one well-organized and accessible text. And finally, this inability, or unwillingness, to deal with “non-standard” musical materials beyond the standard pitch classes and quantizable rhythms is philosophically, as well as practically, a major shortcoming of any such book on computer music. It sidesteps or ignores the vast resources of frequency, time, texture, and timbre that have been hallmarks of the most enduring and important music of the genre. By not delving into these resources for interactive systems based on “musical” knowledge and understanding, this book shortchanges the field and the reader. Just two specific examples serve to illustrate the types of music with which this book, ultimately, has nothing to say whatsoever, and nothing to contribute toward creating music based on these models: Poème électronique by Edgard Varèse, and almost any piece of computer music by Barry Truax. At this point in the development of the field, this is a major omission and a disservice to its readers.

Multimedia

DSP: Digital Sound Processing

CD-ROM, 2000, US$ 27.00; Norwegian Network for Technology, Acoustics and Music [NoTAM], P.O. Box 1137, Blindern, N-0317, Oslo, Norway; Web www.notam.uio.no/DSP/; available from CDeMUSIC, 116 North Lake Avenue, Albany, New York 12206, USA; telephone [888] 749-9998; [518] 434-4110; fax [518] 434-0308; electronic mail emf@emf.org; Web www.cdemusic.org/.

Reviewed by Bill Sack
Buffalo, New York, USA

Very little is currently available in the field of sound creation software for young people, and the few examples that come to mind are little more than toys. Enter DSP, a feature-filled and educational computer music program for children.

The first version of DSP was developed by Jørøn Rudi at the Norwegian Network for Technology, Acoustics and Music [NoTAM] in 1997 to teach computer music techniques and repertory to children in Norway. The product under review is the second version, which has been translated into other languages, including English. DSP is a stand-alone program consisting of software tools for the creation and manipulation of sounds, plus extensive hyper-text documentation about the program as well as short tutorials on the physics of sound and the basics of digital audio.

DSP can install and run on any IBM-compatible PC with a 486 or better processor running Windows 95, 98, or 2000. Hardware requirements are a CD-ROM drive, a graphics card capable of displaying thousands of colors, and a 16-bit sound card. The program makes modest system demands and can run on the sort of aging hardware that might be encountered in publicly funded schools. It installs from its CD through the familiar Windows installation dialogue. A copy of Microsoft’s Internet Explorer 5 is included; the program needs it to display documentation. The installation process will upgrade older versions or can be skipped if an equivalent or newer version is already present. The DSP executable file is copied onto the machine’s hard drive, while the documentation and demonstration files remain on the CD. However, and contrary to the program booklet, the CD must be in the drive in order for the program to run.

DSP’s graphics have a stylized, “aged” look reminiscent of Myst, a popular computer game from several years ago. The program’s widgets and buttons are witty and clever: instead of a static trash can icon, there is an animated fish with exaggeratedly large teeth that “eats” unwanted...
Multimedia

soundclips which are dragged to it. This part of the program seems to have been designed to appeal to younger computer users whose previous experience with computers may have been through gaming.

The main interface is the Mix window, a five track timeline on which monaural sounds can be easily arranged by dragging them around with a mouse (see Figure 1). Volume and pan settings for each track can be set using graphic breakpoint envelopes, and the result can then be played back through the audio output or mixed down to a stereo 16-bit WAV file.

Functions for recording, editing, and synthesis are located in sub-menus of the Sound menu. The integrated sound editor can be used to record new files through any sound card input. It has buttons for adjusting the volume of a sound, fading in and out, copying, cutting, and pasting. Unfortunately, only one editor window can be open at a time, making it impossible to cut and paste between two different sounds. Available synthesis functions include FM, Karplus-Strong plucked string, two-formant filtered buzz, eight-partial additive, and white noise, all with parameters controlled by graphic breakpoint envelopes.

Some of the most interesting features of DSP are available through the Distort menu. Tools here include Granulate (granular processing), Time Stretch, Scratch (forward and reverse variable speed playback), Spectral Shift, Spectral Sieve, and Algorithms. Spectral Sieve and Spectral Shift are FFT-resynthesis tools; the former filters a sound by selectively removing spectral components and is useful for certain types of noise reduction, while the latter produces drastically altered sounds by shifting analyzed partials up or down. The Algorithms submenu provides functions for a simple algorithmic composition program (see Figure 2). One of four algorithms can be chosen to control the frequencies of the resulting melody: Normal distribution (random, but mostly in the center of the range), Brownian motion, Fractal (1/f noise), and Chaos (the Verhulst Equation).

A more standard array of sound processors can be found within the Effects menu: a multi-function filter, chorus, ring modulation, harmonizer, reverberation, and delay. The parameters for each of these, as well as for the Distortions, are controlled by the same type of time-value breakpoint envelopes used in the Mix window. There is no way to enter precise numeric values to any of these parameters—everything is accomplished graphically. I do not see this as a drawback to the program, but rather as a feature: an intuitive, “sound-oriented” approach to composition is encouraged, and the resulting music will sound very different from that made with sequencers, samplers, or other software tools. I only wish that there was a way to delete a breakpoint. An inadvertent click of the mouse can put an unneeded breakpoint into a graph, and once created it cannot be removed.

Projects in DSP are saved as a collection of sound files and a single text file which contains data about their time positions, pan, and mix values. Sound files which have been created but not yet needed in the Mix window can be stored with the project for later use. All effects and distortions are similarly non-destructive, which is to say that the resulting sound is automatically saved with the project as a new file with a unique name. This is not the case with the editor, however. It is possible to duplicate a sound and then perform some editing operation on the copy, but there is no Save As... option. Any action taken on a sound in the editor is irrevocable once the OK button is pushed.
The sound tools are fairly powerful and fun to use, but the tutorial program and help files are the most impressive parts of the program. The centerpiece of the documentation is a 2.5-min composition by Jøran Rudi titled *And the Birds...*. An accompanying text tells the story of how the piece came to be written, and describes, section by section, the techniques used in the creation and modification of the sounds. The project file for *And the Birds...*, as well as all of its soundfiles, are included with the documentation. A good way to become acquainted with the program is to open this project, disassemble it, change parts of it, and put it back together in a new way.

In addition to this demonstration, there is a wealth of context-sensitive help. Clicking on the Question Mark button in any of the windows opens a browser that describes in clear, non-technical terms what can be done in that window. Additionally, there are links in the text that open examples of the function in use; the parameters in these can be changed and tried out by the user. The documentation even includes examples from the computer music repertory; for example, the help file for “Brownian motion” includes a 30-sec excerpt from Iannis Xenakis’s *La Légende d’Eer*!

I found the tutorial aspect of this program to be very well thought out, and it would make a wonderful addition to the curriculum of a junior-high or high-school general music class [is there such a thing in the United States anymore?]! DSP would even be useful in entry-level college computer music courses as a supplement to the standard texts and listening. Aside from its use in schools, it could provide a life-changing experience to a young person interested in the composition of music with sounds, but without previous access to the necessary tools, language, or ideas. What prior generations of young proto-composers accomplished with old tape recorders, current and future generations could do with programs like DSP.

### Recordings

**Freight Elevator Quartet:**

*Fix It In Post*

Compact disc, Cycling74 c74-001, 2001, available from Cycling ’74, 379A Clementina Street, San Francisco, California 94103, USA; telephone (+1) 415-974-1818; fax (+1) 415-974-1812; electronic mail c74label@cycling74.com; Web www.cycling74.com/c74.

Reviewed by Margaret Schedel and John Young Covington, Kentucky, USA; Bethesda, Maryland, USA

What do a cello, a didjeridoo, a Boss Dr. Rhythm, and a Buchla 100 synthesizer have in common? They are the four pillars at the foundation of FEQ—the Freight Elevator Quartet. *Fix It In Post*, their most recent release on the experimental boutique label of Cycling ’74, follows the band from their humble beginnings across four years of live performances and their first four albums from 1997 to 2000. They refrained from calling it a “Best Of...” and so will I (used throughout this review in place of “we”), but if you’re not familiar with FEQ yet, *Fix It In Post* is the perfect place to start.

FEQ formed to fill a void as a party band—at the Columbia University Computer Music Center. Monthly gatherings, dubbed Knuckles, were ostensibly funded by the University to promote interdisciplinary collaboration. We should all be so lucky! FEQ came together at the behest of grad student Mark McNamar to provide musical diversions in the bar—which, as legend has it, happened to be inside the building’s huge freight elevator. FEQ is primar-
from DAT recordings of their early concerts, which were all more or less improvised with little intent towards structured composition or discrete tracks. The album was cut without overdubs or remixing, so it emerged as a nearly pure document of the group's sonic signature. As such, it was surprisingly coherent and musical, though sparse and exploratory compared to subsequent, more heavily produced efforts. *Jungle Album*, a conscious leap toward the trendy electro-flavor of the time, gave FEQ an opportunity to expand their musical horizons beyond what could be achieved in one live take. The time in the studio resulted in a markedly more mainstream sound, as was presumably the point. These songs are tight, focused, and pulse with energy and direction, without losing the identity established on the debut. *File Under Futurism*, a collaboration with Paul Miller, a.k.a. DJ Spooky that Subliminal Kid, took everything to a new level of intensity. The atmosphere darkened, the remixes acquired a more organic feel, and FEQ emerged in a sort of technodystopian shroud. Perhaps most impressive about *Future* is that the artists stamped their personalities on the music in equal measure, exposing and highlighting elements of each others' character that had previously been obscured in the shadows—the beautifully subversive essence of collaboration.

If the first three albums comprised childhood and adolescence, *Becoming Transparent* was the mature realization of all that had come before. As the convergence and unification of FEQ's developmental journey, it had an air of inevitability about it, but was still a significant achievement because so many musicians never reach even this first landmark fulfillment of their potential. If anything, this one emerged too flawless, without the engaging uncertainty, the meticulous homage, or the creative tension that humanized their prior work. They were no longer experimenting, they had figured out who they wanted to be, and in boldly and exquisitely stating so, they left a little bit of innocence behind. But enough musty archetypes—when I would play FEQ for my "normal" friends or crank it on my car stereo while gleefully hurtling toward oblivion, *Becoming Transparent* was the pick. If you're one of those people who thinks authenticity has to be rough around the edges, then you should move on and find some other group whose talent has not grown so obvious.

Which brings us back to *Fix It In Post*. It appears to accomplish two goals. First, FEQ clearly enjoys the spontaneous and unpredictable dynamics of live performance. After three increasingly studio-riffic albums, they probably had an itch to reconnect with their roots. Second, it's a natural point for the group to look back, take stock of where they've been, and grab a deep breath before lighting out for the aesthetic unknown. Every musician has at least one important thing to say. At this point, FEQ has said it, about as perfectly as they could hope for, and now they have to figure out what's next—always a daunting challenge. So, now that you've been burdened with all this context, how does the current disc hold up?

*Pomoerotic*, which kicks off the album, leads with a first minute that would not be out of place on an electroacoustic concert. Then the beat tiptoes in, moments later the bass switches on, and the real groove begins. Here we have the basic ingredients of FEQ: a layer of percussion, a layer of electronic atmospherics and...
The layers really interact here, handing off to one another, commenting, extending—tricks from the classic compositional playbook. There’s even a sense of exposition and development, departure, return, and coda, which almost seems like cheating in the 21st century, but hey—they work! In contrast, Seeming is almost trancelike. It hovers and twirls around itself, revealing a surprising sensuality. It concludes with a male voice lecturing on the principles of contemporary music, breaking the mood with some self-consciously clever irony. Acmend’s Revenge is pleasantly innocuous, redeemed by finally giving the didjeridoo a leading role, at least until it gets overwhelmed by a plodding timpani and eerie howls. The middle is so obviously upbeat that it must be meant tongue-in-cheek, and then the end just dwindles away, a complete non sequitur.

Transparent fuses FEQ’s inclinations towards the manic and the melancholic with a sheaf of avant-garde accessories. More subtle than Downtime, this piece has almost equal seamlessness. An autumnal tone on the cello, a stylish snare flourish, synthetic choral ambience, and didjeridoo undercurrent are all crafted toward a consistent mood. The listener drifts between layers, sometimes freely, sometimes guided by the mix, content to be carried along. How Does It Feel To Be Going Out Of Style is one of four tracks freshly produced for this album. It has a deliberate coolness, accentuated by a repeating guitar riff, off-kilter drum patterns, and lazy electronic harmonies. This tableau grows increasingly disrupted by the static of heat waves warping the desert air at sunset, completing the soundtrack to nowhere.

Dancing atop a tasty breakbeat, Gilgamesh moves from reflection to celebration and back again. A barely intelligible speech opens and closes the piece, with intonations of doom lending a vague sense of unease to an otherwise lighthearted vibe. Bring Me My Mental Health flirts with aspects of trip-hop—dark, dangerous rhyme, slow, halting drums, and everything detuned as if slowly bleeding electricity. These colors are employed to great numbing effect, like struggling towards consciousness after a digital hangover.

Cellophane is another new track, a brief, solemn duet between cello and didjeridoo. It’s a beautiful, meditative contrast to the rest of the disc, and could easily have been developed to double its length without harm. As it stands, it feels like a welcome breather, an opportunity to cleanse one’s sonic palette.

On the previously unreleased Ahmed Goes to Heaven, the cello swaps roles with the electronics, leading with detached rhythmic notes that resist being woven together. Long, low fuzz tones fill in at the bottom end, along with wall-shaking subterranean bass. Soon any acoustic character is submerged beneath a synthesized cacophony, building in volume and complexity then diminishing until the cello can be heard again. If this is heaven, Ahmed must be a robot DJ . . .

The latest incarnation of Infrared may be the most altered out of all the remixes on Fix It In Post. It warms up with an extended introduction reminiscent of ticking clockwork, nearly half its length spent in introspection of passing time or Persistence of Memory. Electric bass and guitar ground the gradual building of momentum until the theme—unusually complete, with contrapuntal and cadential segments—is finally presented by the
Recordings

Future Perfect: The Nature of Time

Compact disc, innova 558, 2001; available from innova Recordings, The American Composers Forum, 332 Minnesota Street #E-145, St. Paul, MN 55101, USA; telephone (+1) 651-251-2823; fax (+1) 651-291-7978; electronic mail innova@composersforum.org; Web www.innovarecordings.com.

Reviewed by Ian Whalley
Hamilton, New Zealand

Based in Minneapolis, Minnesota, Future Perfect is a collection of multi-instrumental musicians and visual effects artists coordinated by Chris Strouth. Their Web site notes that the group is “a cross cultural concept mixing classic and popular electronica, tape loops, found sounds, and concept music.” They aim to “create a trance inducing soundscape . . . presenting it in a challenging and interesting environment: DJ’s, musicians, visual artists, and social historians working together to define a new musical frontier, while showing the world in which we live in a different light.”

The Nature of Time was “commissioned for the Sonic Circuits International Festival of Electronic Music and Art, underwritten by the American Composers Forum with funding from the Jerome Foundation” (CD...
notes, p. 6). A goal of the Sonic Circuits event has been to address the barriers separating different aesthetic approaches to electronic music making. The CD is released on innova Records, the American Composers Forum label, where Chris Strouth is also Director of Artists and Product. The recording is an extension of performances at the Fredrick R. Weisman Museum of Art, Minneapolis, in March 2000. It collects together renditions recorded in individual artists’ studios, mixed by engineer Bob DeMaa.

Advertising for the disc on the innova Web site notes that the Future Perfect sound “can be described as experimental, electronic, acoustic, quiet, loud, and any number of other contradictory adjectives . . . Suffice it to say that it isn’t easily categorized, though you might put it into the modern Electronic bin somewhere near Amon Tobin’s Supermodified but not too far from Main, Cluster, or Bomb 20.”

Mr. Strouth elaborates on the theme “The Nature of Time” in the opening pages of the CD booklet, and the innova Web site notes that the recording is “a seamless blend, to be enjoyed as an experience in and of itself. The record is about time. Time as allegory, time as measure-ment, time as distance, and emotion. Time as it is, beyond just the simple act of counting the moments between events.” It adds that “life is a series of transitions. Think of this record as allegories and abstractions of time, eleven pieces forming a whole.”

One is then left to assess outcomes against the intentions set out to be achieved, the traditions drawn on, and the extensions to it attempted.

Of the eleven tracks on the disc, three feature the work of the group Zaftig, with text and narration by Mr. Strouth. Reading through the introductory booklet notes and listening to the narration on the disc, I am whimsically reminded of Frank Zappa’s description of rock journalism as “people who can’t write interviewing people who can’t talk for people who can’t read.” Musically, one is also reminded of the limitations of contemporary parochialism in the face of a significant past body of work in commercial and non-commercial music from the analog era, and of thinking that new modes of production simply equate with superior or unique artistic outcomes. In combination, the impression gleaned is that the intended audience for the disc should have a limited grasp of the Western intellectual tradition and of the range of musical works within the western popular canon.

Having said this, the production quality on the disc is generally excellent, and there are fleetingly delightful sonic moments.

The opening track, The Nature of Time by A Most Happy Sound, is a collaboration between Lorren Stafford and Mr. Strouth. The notes (p. 5) indicate that this is “dedicated to smashing artistic and intellectual barriers” and combines “elements of Pop, electronica, and New Music to create a genre that will frighten everyone equally.” In fact, it is reminiscent of Vangelis’s science fiction film scoring. The layering is interesting, but the rhythmic blandness in parts obscures the more interesting soundscapes.

Zaftig’s Thin Air (featuring Meleck Davis, Len Madsen, Brian White, and guest Ben Connelly) uses a “battery of percussion and string instruments constructed by band founder, Jeff Federson” [p. 4]. The track again features text and narration by Mr. Strouth. Apart from the rambling monologue, the soundtrack delights with moments of percussive delicacy.

Track 3, by Big Daddy, Jr. & the Spook, made up of Terry Hannen, Jason Ducklinkski, and Tim Ritter, is called Thank Your Stars. In context it sounds very dated, somewhat like Jean-Michel Jarre’s Oxygène with a funk influence, but without Mr. Jarre’s instinctive sense of structure.

Christian Erickson’s The Boxer is the next track, and features the composer [vocals and sequencing], other vocals by Janey Winterbauer and Angela Orluck, and additional sequencing by Tim Ritter and Peter Anderson. This is a rendition of Paul Simon’s original with a collection of rhythmic layers and sequenced arpeggios. Some of the harmonic sense and dramatic orchestration of the original is lost in the translation, undermining the word setting. The hypnotic effect is interesting in contrast.

Alpha 61 [Paul Horn and Jason Shapiro] contribute Remote Delay on track 5. This “ambient” piece is generated through combining layers of timbres into a carefully controlled texture, similar to 1970s-style analog synthesis practices. The semiotic sense here helps to reinforce a better feeling for structural control than on many tracks.

Zaftig returns on track 6 with Longitude. Again, the unique instruments and performance make the piece worthwhile, weaving a gamelan influenced texture that shows promise for future work. In contrast, the dialogue is aimless and inconsequential.

Track 7, Sex and Violins, is contributed by TS [T. Sothiphakkak] & Filmore Diggz. This is a “cut and paste” rhythmic mosaic that combines body sounds, dance riffs, cartoon references, and snippets of
dialogue, and is reminiscent of the mid-1980s British "sample and re-mix" production techniques. This is an energetic track with a surprisingly mixed set of metaphors.

The Radar Threat (Benjy Gross) follows with *Infengal Decrapulation*. Jittering pointillism is juxtaposed with an organ loop, high sweeps, and white noise spectral shaping, building rhythmic layers. This is a coherent and disturbing track with careful control of shape. The effect is more interesting given the note in the booklet (p. 5) that "no computers were used in the composition or playing of this track." The approach is refreshing in context.

Track 9 is by Drone (Dave Jarros) and is called *Psycho Dub*. Mr. Jarros is described as "one of the pillars of Future Perfect" (p. 5). As the title suggests, this is a Dub-influenced track, with a slow, repetitive, and spatialized male rap lead part.

Zafig again returns on track 10 with *Tres Elements* with Mr. Strouth narrating tediously on the central theme of time. Again, it is the instrumental backing that makes the work interesting, and it seems a pity to have not given the group more space to develop on the CD.

The final track is *Essence* by Plodding (Jason Ducklinski, Terry Hannen, and T. Sothiphakhak), who develop a "cut and paste" work. This is the only group that did not play at the original performance in March 2000. A brief monologue is embedded into the texture here more successfully, and the multi-layered texture quickly evolves with fine control. This short track perhaps needs more time to unfold on the disc.

As a "concept album" the disc falls well short of its predecessors in the genre, and the grand sonic goals it set out to achieve prove to be artistically naïve when compared to the output. The disc also makes one appreciate the strengths of the electronic tradition of which much of *The Nature of Time* sounds derivative. However, there are moments on the disc that show promise for further developments.

**Tetsu Inoue and Carl Stone: pict.soul**

Compact disc, Cycling74 c74-005, 2001; available from Cycling '74, 379A Clementina Street, San Francisco, California 94103, USA; telephone [+1] 415-974-1818; fax [+1] 415-974-1812; electronic mail c74label@cycling74.com; Web www.cycling74.com/c74.

**Reviewed by Andrew Kaiser Pittsburgh, Pennsylvania, USA**

Tetsu Inoue and Carl Stone have produced a collaboration in *pict.soul* that is enigmatic, beautiful, and rich in ideas. Each composer is established in his own right, with aesthetics drawn from post-ambient field recordings and heavily manipulated samples that create slowly evolving patterns. Both styles are present in *pict.soul*, but the individual participants remain anonymous. The label that has released this recording, Cycling '74, is also the developer of Max/MSP technology, which is featured on the recording to good effect by both Mr. Inoue and Mr. Stone.

It may no longer be useful to speak of music that moves beyond traditional expectations, particularly to the audience that will come to *pict.soul*. Rhythm is better described as concepts of pulse, articulated in nuanced layers of electronic timbre. If we could visualize a spectral analysis of the music, there would be discrete understood contract with the audience in terms of how the material will be articulated, and then there is music that defines its own internal consistency with each listening. *pict.soul* is of the latter type, and it requires the listener to arrive at some pathway through the unfolding sonic events.

This approach to listening is a matter of attention, of mindfulness even, and we are given direction with the liner notes. Here, we find two haiku, worth quoting in full:

Gazing at the sea—
preparation for holding
this shell to my ear.

The soft breeze that stirs
this vast undulating field
defeats the spider.

There is corporeality to the musical gestures. That word is chosen carefully: "corporeality," with all the biological processes involved in running a body system, and all the sensual implications of physicality. The sounds we hear when we hold a shell to the ear and the rhythms of the body form the basis for *pict.soul*. Rhythm is better described as concepts of pulse, articulated in nuanced layers of electronic timbre. If we could visualize a spectral analysis of the music, there would be discrete
frequency ranges given to the period defined by human breath, overlapping a gesture that maps to the heartbeat. Intertwined between both are patterns that seem to come directly from the firing of synapses. Other larger gestures reference patterns of speech, recalling the filtered conversation pieces of Paul Lansky.

Not that the album sounds like a metro car crowded with gasping hominids, or a gym full of pumping cardiovascular units. We may be immersed in the rhythms of the body, but the craft of the composers is nowhere more evident than in the marvelous display of colors used to mark out the motion of these pulse time units. Often restrained, there’s an elegance to the manipulation that creates a sense of specific timbral coordinates. Motion between these coordinates propels the evolution of the music, while each plane remains constant in its process. A fantastic moment occurs in track 4, ‘transparency.’ After three minutes of stuttering, descending clicks and buzzes, a unison emerges. It is one of the few places where a specific pitch is made explicit, and the effect is of creating not just a new timbral coordinate, but of actually adding a new axis to the spectrum.

It’s nothing new to view electronic music as demarcated frequency planes of activity. The same kind of language is used to describe the instrumental music of Edgard Varèse or György Ligeti. In the music of these earlier composers, the feeling is of enormous interstitial geometric patterns, all the more remarkable when created with acoustic instrumental ensembles. Mr. Inoue and Mr. Stone work for a different affect, one that raises the question of whether there are biological constants which can be mapped to musical gestures. There’s a—probably apocryphal—anecdote describing the reaction of John Cage after he visited an anechoic, sensory deprivation chamber. Perhaps this was part of an ongoing quest for silence: in which case, he was to be disappointed. Cage was confronted with many layers of sound, one of which he later identified as his heartbeat. A second level, some high-pitched frequency, was later identified as the workings of his neural system. Perhaps Cage was being suitably poetic, and the actual documented overlap between the impact of music and the resonance of the human physiology remains to be demonstrated.

*pict.soul* is a recording of subtle beauty, the inner buzz of our biologic pulses. Heartbeat, breath, and some other indefinable space: a space triangulated between neurobiology, a deafened spider, and a synthesized simulation of tinnitus.

### Interface: /swank

Compact disc, *Cycling74 c74-002, 2001*, available from *Cycling 74*, 379A Clementina Street, San Francisco, California 94103, USA; telephone [+1] 415-974-1818; fax [+1] 415-974-1812; electronic mail c74label@cycling74.com; Web www.cycling74.com/c74.

Reviewed by Margaret Schedel and John Young
Covington, Kentucky, USA; Bethesda, Maryland, USA

When I (used throughout the review in place of “we”) found out that Interface had released a compact disc on the Cycling74 label, I was excited to listen to their first official recording. I have seen the duo several times in concert and the experience has always been amazing. Watching two such fine musicians interact with each other, their instruments, and their computers is always a treat. Dan Trueman, a talented violinist, uses his R-Bow, a traditional violin bow outfitted with motion and pressure sensors, to control the shape and direction of the electronic processing with just a slight change of angle, a delicate touch, or a quick flick of the wrist. Sometimes he forgets the acoustic violin entirely, controlling sound with bow sweeps in mid-air. Curtis Bahn is likewise an innovative performer—he has covered his five-string solid body bass in a variety of sensors, including a touch-sensitive mouse pad under the fingerboard. Other controllers include several slide sensors, force sensitive resistors, rotating potentiometers, and a biaxial accelerometer mounted on the bass so that he can easily reach them while playing. He uses the sensors without artifice; they have become part of his instrument and he performs with graceful skill. Watching Mr. Trueman and Mr. Bahn play together is witnessing live interactive music at its best. They are two masterful artists who have seamlessly extended their technique to integrate sensors, a variety of analog pickups, and extensive real-time computer processing into the act of improvisation. There are numerous highlights on the CD (and a love-it or hate-it track-
naming scheme). spogo opens ethereally, with long, whispery, skittish acoustic harmonics in the violin, pizzicato bass interjections, and clear electric insect sounds with reduced partials, ornamented by quickly decaying harp- and bell-like tones. The track grows in intensity and rhythmic interest, evolving in contrapuntal complexity but maintaining a haunting, evocative spirit. Judicious panning and placement on scrb creates a wonderful sense of space and depth, which really helps the listener interpret the sound-object interrelationships and textural development. I thoroughly enjoyed the warped calliope sounds at the beginning of sediment, and this turned out to be my favorite track. It delivers eloquent moments of expanded tonal chords which flash and dissolve into a layer of aural mist. As time passes the chords begin to detune, while tremolo effects create another level of thematic sonorities amidst a halting, delicate hints of (Morton) Feldman-esque sonorities amidst a halting, chaotic soundscape, as if gently bustling the listener back out of the world of Interface's imagination.

On sdoo Perry Cook brings his “DigitalDoo” [a tricked-out didgeridoo] to the party and the mood changes completely. One of the great things about Interface is its flexibility. The musicians each use a single [huge, painstakingly crafted] Max/MSP patch as their primary instrument, yet they are able to use this same system to evoke many different atmospheres. They have created a truly supple musical environment with their solid-bodied viols, sensors, and computers. sdoo is a delightful nocturne replete with chirping insects, howling dogs, and croaking frogs. I could imagine a more daring new-age radio show programming it on the night shift. Over a strong beat, samples weave in and out with distorted abandon to a fevered crescendo, after which the jamboree ever-so-slowly runs out of steam. Here I can really picture Mr. Bahn using the slide control on the neck of his bass to lower the tempo by almost imperceptible increments, revealing the complexity behind the beat or perhaps adding more material as the pace gradually slows.

The title track seems to accurately capture the personality of Interface: it strikes me as an animated dialogue in a highly developed and expressive alien tongue. Nasal synthesizer tones converse with chattering low tones, then partially masked samples of real voices emerge, with occasionally comprehensible speech pecking through the curtain of noise. The word “listen” appears more than once, though this could be just a cognitive psychoacoustic tease. .swank is the longest track, but an elegant arch form helps give it direction and cohesion. Finally, .sacute contributes delicate hints of [Morton] Feldman-esque sonorities amidst a halting, chaotic soundscape, as if gently bustling the listener back out of the world of Interface’s imagination.

/swank was recorded during two public performances in September 2000. I usually prefer the energy and character of live albums, but I don’t feel that this disc truly captures the potential beauty of Interface. I think one has to see them in person to really appreciate the exceptional control they have over their shared sonic canvas. Unfortunately, the virtuosity which is so evident when watching them perform does not translate well to a recording. Without observing Mr. Trueman tilting his bow, or Mr. Bahn turning a pan-pot while ripping out a pizzicato riff, it’s impossible to connect their gestures with the music. And as with much improvisation, the most fascinating aspect of the work is in the interpretation—that the performers create from their raw materials. Without a strong sense of those materials, and the transformative gestures that turn a simple stroke of the bow into a complex evolution of timbre, the magic of Interface becomes elusive. Often the CD sounds excessively active and dense, but I have never had this impression during their live sets. I don’t think the music is any different, but somehow without the benefit of gestural cues, it becomes difficult to appreciate the elegant lyricism I associate with their performances.

As a result, Interface is at their best on this disc when they are restrained, allowing space for the subtle shaping of timbre and phrase to emerge and develop without obstruction. There are certainly moments of this exquisite beauty on .swank, but without any visual feedback to help decipher the sonic data it was not easy for me to fully comprehend their musical language beyond a certain textural density. Experiencing Interface live, one can anticipate and understand their sophisticated dialect, and the process of its creation, rather than merely grasping at fragments or surrendering as a passive listener. It’s always a particular challenge to capture the finest qualities of live electronic music on a static recording. So, if .swank doesn’t move you, just be aware that it doesn’t really do justice to the unique strengths of Interface—go see a performance.

New Zealand Sonic Art

Compact discs, 2000 [NZSA 2000], 2001 [NZSA Volume II], available from The University of Waikato, Department of Music, Private Bag 3105, Hamilton, New Zealand MDWU1201; Web www.waikato.ac.nz/music/nzsonicart/.
Reviewed by Jim Hearon  
San Francisco, California, USA

New Zealand Sonic Art 2000, and New Zealand Sonic Art Volume II, are compact discs from the Digital Music Studios of the Department of Music at The University of Waikato, Hamilton, New Zealand. These two CDs feature electroacoustic compositions selected from a group of lecturers, composers, and senior lecturers following a call for works from New Zealand citizens and permanent residents. The first recording was made possible by an initial grant from the School of Humanities Research Fund at the University of Waikato. The series is produced under the artistic direction of Ian Whalley, with studio engineering and graphic design assistance from Kim Walker and William Dart. The result is an excellent series that continues to grow, with plans announced for Volume III (www.waikato.ac.nz/music/nzsonicart/nzsonicart3.shtml).

The first two discs pay homage to one of New Zealand’s most famous pioneers of electronic music: composer and teacher, Douglas Lilburn (1915–2001). During the 1930s, after winning a composition prize offered by Percy Grainger, Mr. Lilburn attended the Royal College of Music in London and became a student of Ralph Vaughan Williams. In the 1960s he visited Darmstadt and also worked in the electronic music studios at the University of Toronto. In 1966 he established the Electronic Music Studio at Victoria University in Wellington, the first in New Zealand or Australia. It was in 1975 that he turned his attention exclusively toward the composition of electronic music. It’s a pity none of Mr. Lilburn’s pieces have yet been included in the series.

As compilations go, these CDs work very well in terms of unity of mood, technique, and pacing. The final mastering is very well done and provides a smooth listening experience from beginning to end. New Zealand Sonic Art 2000, the first in the series, features works by John Young, John Elmsly, Michael Norris, Miriama Young, Chris Cree Brown, John Rimmer, Matthew Suttor, Lissa Meridan, and Dugal McKinnon.

Emphasizing electronic and digital processes presented in refined technical detail, the works on the CD are all consistent with high quality academic digital music studio production. As a point of researching influences, it would be interesting to compare some of Mr. Lilburn’s electroacoustic works with the pieces in the current collection, but his LP recordings are now out of print. The Kiwi-Pacific 3-LP boxed set, New Zealand Electronic Music (KIWI SLD-44/46, 1975), for example, featured some of Mr. Lilburn’s early electronic works and showed some of his experimentation in the medium he valued so highly, the new found love of which he apparently passed along to many young composers. Another LP, Soundscape (KIWI SLD-59, 1979), was entirely works by Mr. Lilburn, but both are unavailable, and have not yet been remastered for digital media.

New Zealand Sonic Art Volume II (2001), the second of the series, features works by Lissa Meridan, John Rimmer, and Chris Cree Brown—all composers from the first, as well as compositions by Daniel Beban, Kit Powell, and Craig Sengelow. Mr. Beban’s Herakles is fuel for an entire CD in itself, featuring humdrum sounds from the gym and squash court, the clang and clatter of dumbbells, high-pitched screeching of rubber tennis shoes against the squash court floor, as well as the grunts, groans, and shouts of weightlifters. The natural sounds all help to create a kind of rhythmic randomness and cacophony akin to a high-octane, Derek Bailey improvised guitar solo. Therein lies the affinity to utilizing natural sounds in an experimental manner where Mr. Beban along with groups such as Dooblong Tondra and International Observer are heirs apparent to the legacy of Mr. Lilburn’s experimentation in the electronic medium.

Libraries, schools, researchers, and individuals interested in the sonic references of New Zealand will find these CDs a valuable addition to any growing international collection, and well worth the cost of the purchase.
Products

BitHeadz Unity DS-1 Software Sampler and Retro AS-1 Software Synthesizer

US$ 449 (Unity DS-1, version 3), US$ 259 (Retro AS-1); available from BitHeadz, Inc., 4400 Capitola Road, Suite 202, Capitola, California 95010, USA; telephone (+1) 408-465-9898; fax (+1) 408-465-9899; electronic mail info@bitheads.com; Web www.BitHeadz.com/. Reviewed by Ian Whalley Hamilton, New Zealand

BitHeadz’s Unity DS-1 and Retro AS-1 put an analog hardware sampler and analog synthesizer, respectively, as software onto Windows or Macintosh platforms, and allow them to integrate with packages like Digital Performer, Digidesign ProTools, Emagic Logic, and Steinberg Cubase. Using both BitHeadz packages in the studios at Waikato University in various configurations and versions and under various models of Macintosh for some time has afforded a sense of their practical implementation. The motivation for initially using these packages was the cost when compared to buying further hardware modules.

The packages assume a traditional way of thinking about sound generation, in contrast to more flexible contemporary software packages. It is then most fitting to judge the DS-1 and AS-1 in comparison to hardware units.

It is impossible in a review of this length to give a full evaluation of all the possible configurations on all platforms, or to give a full appraisal of every aspect of the software packages. Recent reviews on both programs in various incarnation and combinations can be accessed through the BitHeadz Web site. Based on this, most reports of the software are very positive. This reflects my experience, with the caveat of my having access to the latest Macintosh machines, sound cards, and extensive RAM upgrades. Without these, experiences may vary, according to accounts on the review page of the Web site.

The comments made here refer to current and previous versions of the Macintosh editions, used mainly in combination packages specified. [Editor’s Note: Bitheadz is now packaging the AS-1 and DS-1 together as Unity Session, for Macintosh platforms only, including OS X. Unity Session also includes Osmosis, a software sample converter, as well as a large collection of samples, synthesizer pre-sets, and physical models.] Both programs are quick to install and are relatively simple to integrate with ProTools and Digital Performer, assuming familiarity with the MIDI and audio drivers in the respective packages. Early problems with patch list integration in Digital Performer have been overcome, and the packages are compatible with FreeMIDI, PC300, OMS, and CoreMIDI. MAS, VST, RTAS, DirectConnect, and ReWire protocols are all supported. Depending on the computer processing power, the stand-alone Unity DS-1 will support up to 256 possible stereo voices; Retro AS-1 supports 128-voice polyphony. Both ensure a true phased-locked stereo signal path throughout.

A brief outline of the current specifications from BitHeadz is first worth noting. Both packages have two assignable stereo filters per voice and 13 filter types, including 4-pole resonant low-pass, high-pass, band-pass, all-pass, notch, and state-variable. Multiple inputs allow parallel and/or serial filtering, and there are per-filter cut-off, resonance, cut-off modulation source/amount, and overdrive controls.

The DS-1 package comes with one GB of samples, and allows these to be played from RAM or streamed from the disk within environments such as ProTools. It can play 24-bit Sound Designer II, AIFF, CD-Audio, DLS, SoundFont 2.0, SampleCell II, and WAVE files. Multi-samples allow up to 128 samples per MIDI note, selectable via velocity or controller cross-switching, and there is control of sample volume, tune, pan, sample start, FX send, envelope, and mute grouping. Sampling allows selectable interpolation (Linear, Quadratic, Lagrange, or none), and a built-in sample editor includes a stereo record function with level controls. Signal-processing functions include normalize, gain, fade, reverse, cross-fade loop, equalization, and so forth.

Only computer processor power limits DS-1 modulations and routings, and most parameters are available as a modulation source and/or destination. There are six-stage envelope modulators (delay, attack, decay, sustain, sustain decay, release), selectable linear or exponential curves for envelopes, and six low frequency oscillator (LFO) waveform shapes. LFOs can be synchronized to the MIDI clock, and four continuous MIDI controller modulation sources are available simultaneously.

The AS-1 synthesizer package comes with over 1500 different sounds. MIDI plug-ins include arpeggiator chord, arpeggiator played, channelize, chord, key, and transpose. Full control of layers, splits, and the arpeggiator is provided. The unit allows three stereo oscillators and two stereo filters per voice, and has an eight-octave range per oscillator. Frequency modulation is allowed
from any oscillator or filter, and a ring modulator is also included.

AS-1 effects plug-ins include chorus, compressor, degrade, dual chorus, dual delay, dynamic filter, flange, overdrive, parametric EQ, phaser, pitch bend, pitch shift, quad delay, reflection, reverb, shelf EQ, single delay, stereo chorus, stereo compressor, stereo delay, stereo flange, stereo phaser, and stereo pitch shift. There are two additional stereo global (parallel) effects processors, and the delay times can be synchronized to MIDI clock.

Both packages are driven in a similar fashion though a suite of modules used according to what task is being completed. AS-1 includes an Editor, MIDI Processor, on-screen Keyboard, and a Mixer (see Figure 3). Other windows allow for routing and setting the processor overhead. The arpeggiator is set in the MIDI screen, as are layers settings and splits. The Editor module allows the creation and modification of sounds, and has tabs for Main, Modulation, Effects, and Global pages. Global controls influence parameters such as volume and pan.

The main edit module allows the construction of patches graphically, patching things together in much the same way as an analog device, but without the physical inconvenience of weight and wires. Flicking between the module windows is often necessary to get the desired results.

DS-1 modules include five applications, offering the full range of options of a hardware sampler with the advantage of full-screen editing. The editor is the main module used for audio sampling, DSP processing, multi-sample grouping, and program creation. Modulation routings and other synthesis generation options are also included here. The Keyboard module gives the opportunity to play sounds when no external trigger is connected, and the Mixer module allows access to global effects and programs in the multi-timbral sequencer to be effected with user facilities such as pan and level.

The MIDI Processor module is where program layers and splits are assigned and the MIDI arpeggiator unit controlled. Finally, the Control modules allow one to make set-up decisions like CPU power allocation, buffer size, RAM reservation, and the number of voices allowed. One aspect of the software not seen in the modules is the sample engine that all the modules access, and this also gives access to samples from external applications integrated with it.

In terms of stability, both packages are best when used as stand-alone applications, properly configured, on fast machines. Alternatively, significant amounts of RAM may also alleviate many problems, as we found attempting to run AS-1 with Digital Performer on i-Macs. With high-end machines there are fewer problems, and the trick of using both packages is to “live within your means.”

DS-1 compares well with hardware-based samplers particularly when integrated with ProTools. It is both easy to use and quick to learn provided the hardware equivalent is understood. The sample quality, with some tweaking of the pre-sets, is more than adequate, and the very minor latency problems encountered are negligible with various workaround solutions. The software upgrades have addressed each aspect of the limitations of each previous version well, making the software increasingly usable and trouble-free.

One helpful feature is being able to import sample libraries from other hardware units such as Akai, as well as the key-groups. The range of export sound formats is not quite as flexible, but poses few limitations in context.

Final sound-quality output and
flexibility of course depend on what computer hardware you use. DS-1 will operate with an ASIO-compatible PCI audio card, and the more of these, the greater the flexibility in using the sampler combined with other software packages, still making the combination cheaper than a full-specification hardware sampler. A further advantage is the built-in General MIDI banks that can be used as a substitute for the limited Quicktime pre-sets.

DS-1 is, then, a flexible, powerful, and cost effective package in the face of hardware competition. Provided you accept the limitation of the software design model on which it is based and integrate it with other sound generation programs to develop more experimental sounds, it provides a solid alternative sampling core to the digital studio.

AS-1 opens up far greater sonic possibilities, and is astounding value for the money. “Slow-down” problems on older computers can be addressed by programming sounds off-line rather than attempting this while synchronized with other programs and trying to control many parameters over a number of MIDI channels. Again, additional RAM and proper configuration helps solve many problems.

AS-1 gives a full range of analog sound possibilities, from traditional sounds to expressive pads, to complex and evolving textures. The graphic windows have made it increasingly easier to manipulate than traditional hardware approaches. It has also proven to be a good pedagogical tool for learning about traditional synthesis. In addition, it gives one back the benefits of analog synthesis in a digital studio with far more flexibility than many equivalent hardware units.

Sonic Implants Amps + Pickups SoundFonts

US$ 149.95; available from Sonic Implants; telephone (+1) 888-769-3788; electronic mail studio@sonicimplants.com; Web www.SonicImplants.com/.

Reviewed by Eric S. Strother
Lexington, Kentucky, USA

ChordWizard Chord Reference Software

US$ 26.95; available from ChordWizard Software Pty Ltd., P.O. Box 67, Dulwich Hill, New South Wales 2203, Australia; telephone (+61) 2-4969-7688; fax (+61) 2-4969-7699; electronic mail support@chordwizard.com; Web www.chordwizard.com/.

Reviewed by Eric S. Strother
Lexington, Kentucky, USA
chordshapes’), and is easily customizable to fit the user’s needs.

The installation process is simple and allows the user to begin customizing the software through a series of dialog boxes. The software offers three skill-level settings (beginner, intermediate, and advanced) to control the available chord and scale types. By switching between these levels, the user can expand or limit the information she or he receives from the program. The software also has five standard instrument libraries from which to choose (guitar, mandolin, banjo, ukulele, and bass guitar), and even gives users a choice about the orientation of the fretboard on the screen.

Once the software is set up, the program displays a lot of information without being cluttered. The default look is for the fretboard to be across the top of the window with two chord lists on the bottom [see Figure 4]. One list is the chord library, which displays every chord available in that library, and the other is the matching chord list, which displays the chord names that correspond to the chordshapes shown in the library. When a chord is selected from the library, the program plays the chord and displays the finger positions on the fretboard. It also indicates what notes are being played and their functions within the chord [i.e., 3, 7, #9]. Chords can also be played by clicking on an icon at the top of the window or by pressing the right mouse button while strumming across the strings.

The software allows users to modify the chord libraries, chordshapes, and instrument libraries, as well as to choose how chords are sorted and grouped, whether imperfect matches are permitted, and how to handle...
bridging. Further, users can filter chord libraries by chord quality and other criteria to make searching for chords easier. Chordshapes can be created or altered simply by clicking on the fretboard or using the Suggestion option, which scans for all chords that match the specified criteria. Instruments can be created and modified using the New Library and Library Instrument menus, where the user can choose the appearance of the frets, the tuning of the strings, and whether or not to use a capo.

Other features include menu options which show the relationships between chords and help the user find chords and scales that include particular notes or fit certain progressions. The software also allows the user to print out chord books and scale charts based on either the full library or filtered lists.

Unlike many software packages, the Help file for ChordWizard is quite useful. The Help window opens by default, and from there the user can access a variety of options. The most useful is a quick “how-to” guided tour of the program. The Help window also includes a music theory primer and a user’s guide.

All in all, this software package is versatile, easy to use, and fully customizable. The software is available for downloading at www.chordwizard.com; it allows 10 sessions before requiring the user to pay the US$ 26.95 registration fee. [Editor’s Note: A newer edition, ChordWizard Gold, v2.0, has been released since this review was undertaken.]

**Beatnik Mixman StudioPro 4.0**

**Remix Software DM² Digital Music Mixer**

US$ 69.95 [StudioPro 4.0], US$ 119.95 [DM²], available from Mixman Technologies, Inc., P.O. Box 330042, San Francisco, California 94133, USA; electronic mail info@mixman.com; Web www.mixman.com/.

Reviewed by Eric S. Strother  
Lexington, Kentucky, USA

**Mixman StudioPro 4.0**

For years, Mixman Studio has been the standard in remix software. Beatnik, Inc., acquired Mixman Technologies in 1999, and the latest version of the software, StudioPro 4.0, gives the user even more options for creating and disseminating their mixes.

Installing the PC-based software is simple, but can be time consuming if the user loads all of the sample files. By default, the program opens in the Control Room, where users can select from four different studios to create and tweak their mixes. This multi-studio dimension is what sets the StudioPro software apart from the Mixman Studio software. The Remiking Studio is the heart of the system and the most likely choice for creating the mix; the Recording Studio allows users to record new sounds to use in their mixes; the FX studio provides tools to alter the characteristics of the sounds; the Editing Studio enables users to fine-tune their mixes to create a professional sounding finished product. The mouse or keyboard controls the commands and processes of each studio.

Unlike MIDI sequences, which can be created one track at a time in step-time, Mixman mixes are created by combining up to 16 tracks of audio files in real-time. In the Remiking Studio, each track is assigned a position on one of two virtual turntables and can be turned on or off by selecting or unselecting its position.
on the turntable. When loading each sound, the software uses a series of algorithms to match the tempo of the new track to the tempo of the mix, either by altering the time or pitch of the track, depending on the user’s preference. Up to eight macros can be created to activate or deactivate multiple tracks at the same time. Controls on the virtual turntable adjust the panning, pitch, and volume of each track, as well as the tempo and balance of the mix. The Remixing Studio also features a Wideband Audio Real-time Processor (W.A.R.P.) control that allows the user to add special effects to the mix while recording, such as flanges, delays, phasing, and other distortions.

Because mixes are created in real-time, users will likely want to use the Editing Studio to adjust their mixes. This studio helps users make precise adjustments by adding, removing, and moving track data. Pitch, volume, and panning effects can be edited, and data can be quantized from whole note to 128th-note for uniformity.

StudioPro 4.0 has a number of options for saving and distributing completed mixes. Files can be converted to popular formats, such as WAV, MP3, WMA, and RealAudio, as well as the proprietary TRK and RMF formats. Mixman mixes can also be exported to the Soundfont 2.0 format to be used with Sound Blaster and other Soundfont-compatible sound cards.

The latest version of StudioPro gives two options for Internet mix sharing. The first, My Mixzone, is a customizable Web page at www.mixman.com that allows users to share either a RealAudio preview of the mix or a remixable file. The other option is Mixman Radio, which broadcasts mixes to other Internet users who can listen to and rate the mixes.

**DM² Digital Music Mixer**

Although it is possible and enjoyable to create these mixes using the computer keyboard and mouse, some users might want a more tactile approach to the process. For that, Beatnik has created the DM² Digital Music Mixer. This is a USB controller which allows users to take a more “hands on” approach to creating their mixes. The controller looks like a pair of turntables with a few buttons, a 360-degree joystick for W.A.R.P. effects, and a crossfader. The installation of the software is simple, but the hardware can be tricky. If the controller is plugged into the USB port before the drivers are installed, Windows may not detect the device. Once it was properly installed, I found that creating mixes with the controller and accompanying software felt more natural than using the mouse and keyboard.

The DM² has a couple of features that are not available in the StudioPro software. One is the “scratching” ring around each turntable. Scratching is available in StudioPro as a W.A.R.P. effect, but the rings make it easier to control. The other feature is a set of transformer buttons which allow the user to override the crossfader for specific effects.

My initial reaction to this controller was that it is a good idea but would probably not have much appeal to the serious musician. In many ways it looks like a toy rather than a musical instrument, and I believed it would only be used by amateurs to create mixes for fun. After using it for only a few minutes, though, I was convinced that it can be a serious tool as well.

There were some problems with the initial release of the DM², the most prohibitive being that it worked only under Windows 98 and Me. I felt this was a major flaw in planning since the initial release of the DM² occurred only months before the release of Windows XP. Beatnik has since addressed this issue, however, by creating a downloadable patch which enables the DM² to run under Windows 2000 and XP. Hopefully, new installation discs will be able to install normally under these operating systems because the patch installation is a little awkward to work with.

Another problem with the DM² was that the software that was bundled with the controller was a much more limited version of the Mixman software than StudioPro 4.0 (containing only three W.A.R.P. effects and four macros), thus forcing users to choose between using the hardware controller and using the more feature-rich software. To solve this problem Beatnik released StudioPro 4.5 as a downloadable upgrade for StudioPro 4.0 users. There are still differences in the features of the StudioPro software and the ones available on the controller, which means users still need to use the mouse or keyboard to select some effects and macros. I hope that Beatnik carries through with this concept and develops a new design for the controller, perhaps a “Pro” model that will eliminate the need for multiple input devices.

Mixman StudioPro 4.0 lists for $69.95 and the DM² lists for $119.95. The on-line store at www.mixman.com also lists a special price of $179.95 for a bundle package of the DM² controller and StudioPro 4.5.
Native Instruments: Reaktor 3
Software Synthesizer

US$ 499.00, available from Native Instruments Software Synthesis, GmbH, Schlesische Strasse 28, D-10997 Berlin, Germany; telephone (+49) 30-611-035-30; fax (+49) 30-611-035-35; electronic mail info@native-instruments.de; Native Instruments USA, 6477 Almaden Expressway, Suite D2-F8, San Jose, California 95120, USA; telephone (+1) 800-665-0030; fax (+1) 408-266-6591; electronic mail info@native-instruments.com; Web www.native-instruments.com/.

Len Sasso: Native Instruments Reaktor 3—Wizoo Guide


Reviewed by Jonathan Segel
Oakland, California, USA

Reaktor 3

Reaktor, Version 3, is Native Instruments’s premiere software synthesizer. As such it is a very large collection of tools that allows the user to build their own synthesizers, sample manipulators, sequencers, and effects processors, utilizing a vast array of pre-made modules and objects as building blocks.

The manual that comes with the application contains some how-to information, but its strength is that it holds a large reference compendium of the available objects, their functions and uses. Len Sasso’s Reaktor 3 Guide, written for Wizoo, is the appropriate how-to manual to fill in the gaps and get the user started on the road to creating their own instruments.

In Reaktor 3, a patch or instrument is always represented on two levels: the front level is a GUI panel that mimics a machine interface, where the controller knobs, buttons, and sliders live, as well as any scopes (see Figure 5). A double-click on the face of an instrument brings up its structure: here is where you manufacture the instrument. In this environment, you place the available objects or modules, and draw patching lines between their inputs and outputs (see Figure 6). When opening an individual object, you also specify this object’s behaviors and its appearance in the front panel. I believe that this structure lends itself very well to helping a new user understand basic synthesis, or to help a student bridge the gap between using hardware synthesizers and understanding computer-based synthesis.

Reaktor 3 is used worldwide by many recording and performing musicians, and although much of its use...
Computer Music Journal

is geared toward popular or dance music production, I believe it could be a feasible learning environment for teaching software synthesis. A brief conversation with Native Instruments’s sales representatives informed me that their educational pricing is half of the list price, unfortunately making it fairly expensive for use at multiple stations. The software is protected by a USB dongle, and one additional dongle can be purchased for US$149.

The application comes with a large set of pre-made instruments in the form of a library divided into three folders: Essentials, Premium, and User. The Essentials folder contains many pre-made basic ensembles of various types of synthesizers, drum machines, sample player/manipulators, and sequencers, as well as tutorials and a folder of the macros used to make these instruments. The Premium library contains a smaller number of more complex instruments of these same sorts, which have been manufactured with many preset sounds to show off their capabilities. The User library contains hundreds of ensembles and instruments that have been made by Reaktor users over the past few years. Many more are available from the on-line library (www.native-instruments.net). The manual gives a brief overview of how to use a few of the provided instruments, and a brief description of the processes involved in making a synthesizer in this application. The remainder of the manual concerns itself with describing the operations of the modules that one can use to make a synthesizer.

**Len Sasso’s Guide Book**

Mr. Sasso’s book could easily be used in place of the manual to learn the process of making instruments within Reaktor, although the manual is definitely useful as a reference guide. Mr. Sasso begins with a description of the installation process and what is included with the software, and then goes over many of the pre-made instruments in the libraries that are provided, briefly explaining how each one functions. This serves not only as a great overview of the possibilities of the application itself, but as a refresher course in sound synthesis! It certainly can’t hurt to review how, for example, different forms of modulation work when learning how they function in a new instrument.

From these introductory chapters, the author leads us through the step-by-step construction of a simple subtractive synthesizer, explaining in detail how and why each component is used. From this point, he assumes the reader can utilize the same construction methodology and so begins to discuss construction using macros, which are encapsulated parts of a synthesis instrument. Based on this model, he then goes through the manufacturing steps to create various frequency modulation (FM), amplitude modulation (AM), ring modulation (RM) (Reaktor does not do phase modulation), wavetable, and vectored wavetable synthesizers.

The fourth chapter of the book deals with Reaktor 3’s sampler modules, several of which have automatic tempo calculation for synchronization. He starts by explaining the basic sample playback module and expands from there, using sample players as oscillators in the previously modeled synthesizers or using the different sample lookup functions in the beat loop modules.

Reaktor 3 has three different granular synthesis modules, with different control structures for creating
different methods of granulating the samples. Along with explaining their respective uses, Mr. Sasso briefly explains granular synthesis in general and how it can be used in resynthesis.

The next chapter deals with building a sequencer from the ground up, and introduces the ideas of using pulse clocks or sync. He then describes manufacturing step sequencers and event table sequencers.

The following chapter deals with creating filters, delays, reverberation, and other effects processors, which Reaktor 3 is extremely competent at doing. There are many modules available that make shaping effects highly controllable. Of particular interest are the waveshaping objects, controllable as static or dynamic processes. Storing effects as macros allows the user to incorporate them easily into the structure of their instrument, but of course delays and reverbs are processor-intensive. A simple command exists for calculating CPU usage while audio is enabled, which disables the audio output and calculates each module’s load.

The last section contains various descriptions of useful control objects and methods of utilizing Reaktor’s vast collections of objects, including buttons, control randomizers, matrix routing, automation, as well as descriptions of the math objects included as part of the package.

Summary
Although Reaktor 3 is an extremely versatile piece of synthesis software, it is not as personally configurable as something like Max/MSP. However, that very nature makes it perhaps an easier starting point in the computer music world, wherein users would be able to manufacture their own synthesizers and produce music in a relatively short time. The actual sound quality of the software is quite good, and it has choices of several sampling rates in which to do its calculations, regardless of the output sampling rate. There are a few small things that could be looked after, like velocity zone mappings for the sample players (!), or an easy visual map for sample-to-MIDI-note assignments. These issues are balanced by the ease with which most operations are taken care of; for example, MIDI mapping to external controllers is as simple as highlighting the on-screen control you would like to be mapped, hitting the MIDI Learn button and then moving the controller that you desire to map from. It maps automatically.

Native Instruments keeps this software up-to-date for both Macintosh and PC platforms, and it has spawned a number of other applications that they have based on the processes in Reaktor. In my opinion, this package is one of the best and most comprehensive applications in the world of commercial software synthesizers.