Chroma

Newsletter of the Australasian Computer Music Association, Inc.

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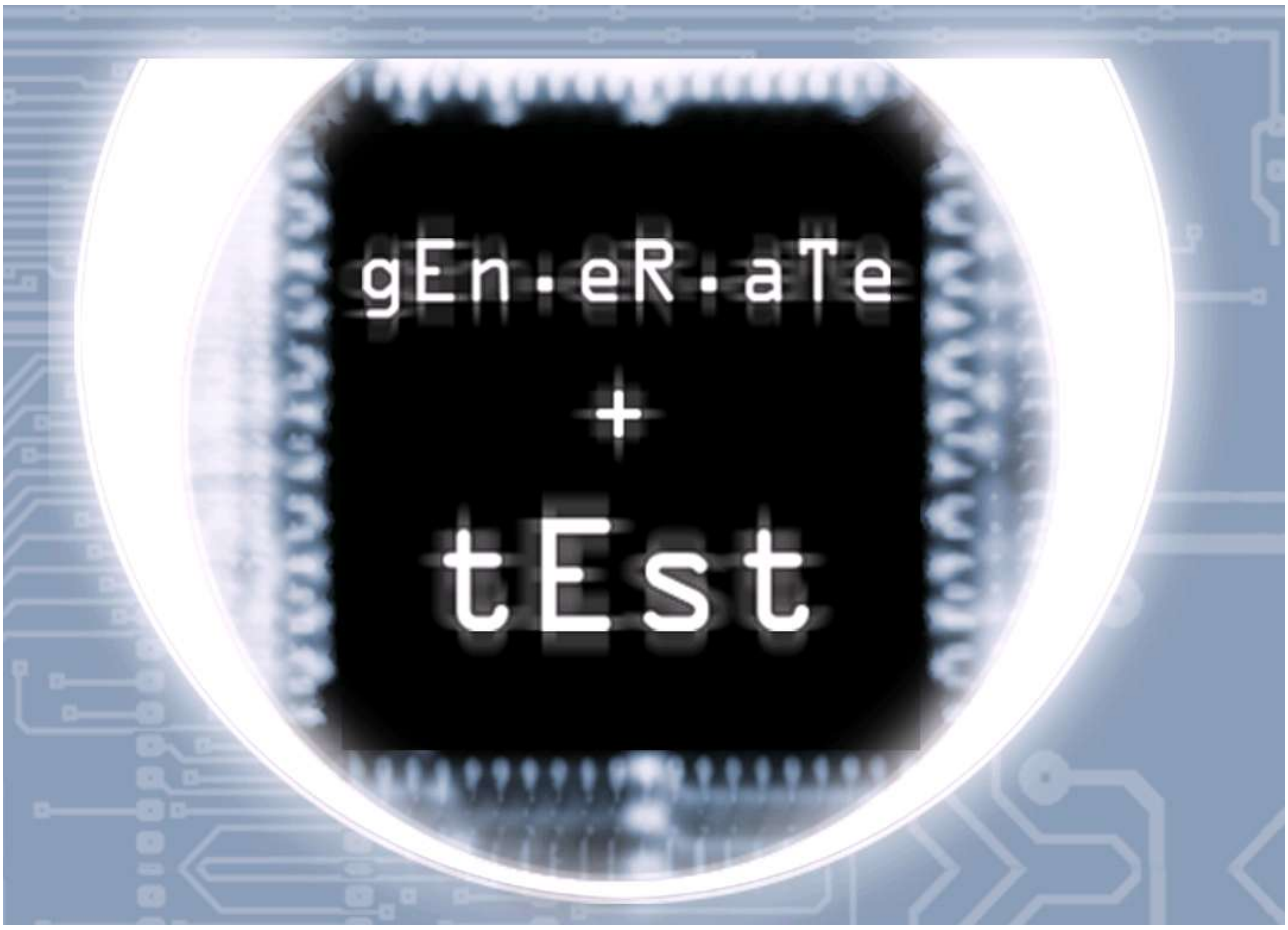

Editorial

It seems like only four weeks ago, Greg Jenkins, Andrew Brown, Rene Wooller and myself were sitting in an Indian Restaurant in Wellington discussing if and how we could run an ACMA conference in Brisbane in 2006. Time tends to contract rapidly when there is a huge workload ahead of you. I am sure Einstein mentioned it in some scientific publication. Anyway, despite planning a huge conference, something I plan not to do again without a long long rest, I have finally put another edition of Chroma together.

This edition offers a wide range of ideas and topics ranging from mathematics to aural intrusions. I just want to remind the readers that the opinions offered in this newsletter are the opinions of the authors, and not ACMA. I am sure that all of the authors are quite willing and even hoping to discuss their opinions with you. There is at least one article here that I envision will generate a large and heated discussion. There are discussion forum times planned for ACMC05 – so make the most of them.

This edition has been an experiment in publishing exclusively with open source software. I hope you enjoy Chroma 36, and I hope we all have a great time at ACMC05.

Timothy Opie

Presidents Note

I hope to see you all at the ACMA AGM in Brisbane on the 14th of July at 9am.

Paul Doornbusch

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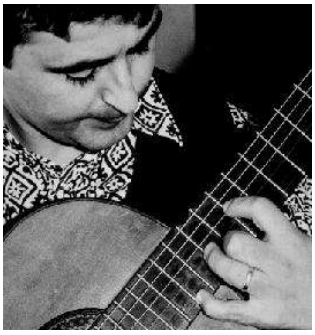


Angelo Fraietta

How did you first get into computer Music?

That fact that I got into music at all, let alone computer music, is a total amazement to me and something that I would never have dreamed would happen.

I came from a Calabrese background where hard work and providing for ones family were all that were really important. From the age of five, I sold flowers at "the farm," which was a market garden in Dee Why. I worked there until my father became ill. Music was not a part of our lives at all; on the contrary, we were discouraged from playing music. I remember when I was about ten, trying to make a flute out of the bamboo that we had growing nearby; however, I had no idea of what to do to make one. My first introduction to any music was in fifth grade where I was put in Mr. Lloyde's class, where he played guitar and we sang. I remember seeing the children in Miss Bolt's class playing the recorder, and I was very envious! Providence had it that I was placed in her class in sixth grade, and so I sang in the choir and learned the recorder. In my first year of high school I excelled in music. My teachers tried to encourage my parents into buying me an instrument; however, only Gypsies and bludgers take that path! Music had been taken from my life, so I rebelled.

I joined the RAAF at fifteen as an apprentice Radio Technician and went to Melbourne. I remember buying myself an electric guitar and playing it while everyone else was studying; there was no link for me at this point between music and electronics. When I had finished at Radio School, I was posted to Newcastle, where my only interest was playing the guitar. In 1987, I started studying classical guitar under Terry Latham, which was a turning point in my musical outlook. I was posted to Penrith and started studying guitar under Gregory Pickler from the Sydney Conservatorium. I applied to study Music at UWS in Penrith because I was impressed with Michael Atherton. I remember getting a promotion to sergeant, finding out my wife was pregnant with our second child, and then immediately putting in for a discharge to study music full time when I received notification of my acceptance. Only my wife and a few close friends were supportive of this decision—many people thought I was a fool (some people still do!).

During my study at UWS, I was introduced to computer music through Jim Franklin and Julian Knowles. I was a full on guitarist, gaining my A.Mus.A. at the end of first year; however, when we started Max programming in second year, my mind was completely blown out and computer music became an obsession. In third year, I was involved in two collaborative projects: the Laser Harp by Alex Cockburn, and the Virtual Drum Kit by Guy Robinson. The Laser Harp is an instrument that is performed by cutting laser beams with the body, while the Virtual Drum Kit entails a performer playing an invisible drum kit. I remember wishing that Max was available for PC, so I wanted to develop Algorithmic Composer for my Honours project. In that year, I moved back to my house in Newcastle and learned C++ programming from books. During that year, I also did electronic assembly work for Neil Kilgour and Associates, where I really learned a lot about designing hardware.
Although I graduated that year with First Class Honours and was awarded the Sydney Mechanics School of Arts Award in Theoretical Studies for the project, I felt that I had personally failed. I was so totally obsessed with computer music; I failed as a husband, father, and son-in-law. I promised that that would be the end of computer music for me—or so I thought.

I was offered a job at Hunter Watertech (HWT) as a programmer for real-time embedded systems. During the interview, I pushed the point that engineers are artists: they bring into existence that which did not previously exist. I also pointed out that "real-time" in music was more critical than their systems. I remember the others talking about their electrical engineering degree while I bragged that I got in with a music degree. It is funny to think about, because Greg Schiemer has his Ph.D. in electronics but is a full on composer. I look at his MIDI Tool Box (MTB) and am completely blown away by what it actually

does. I am looking forward to finishing my Ph.D. so I can have time to play with one.

While at HWT, I developed a simulator of the RTOS that we would be using on the embedded hardware. The simulator, which ran on windows, was based it on multimedia timers—a feat I learned while making Algorithmic Composer—and was used before we had hardware. This is one idea that I encompassed for the Smart Controller. There was a program there called ISaGraf, which is a programmable logic control package that can be used to program hardware devices using function blocks and virtual wires—just like Max. I used to program the hardware to generate polyrhythmic patterns on relays in order to test the performance. The software was not suitable for musical usage due to the time delays. This became the seed for the Smart Controller. I applied for a Scholarship at UWS to develop the concept of the Smart Controller. The university rang me in December 1999 and asked if I wanted to accept the scholarship. I told them that I could not as I had too much responsibility, and was not sure of what I wanted to do, and they should give the scholarship to someone else. The university rang me again in March and told me that my name had come up on another scholarship; I didn't have to decide until the following Monday. I was terrified to tell my wife about it. That weekend, I went to the Katoomba Mens' Convention and heard Ravi Zachariah preach, where he mentioned some children being unable to relate to other people because they are so involved with machines. He stated that it would be terrible if machines totally replaced people as artists, making people redundant. I spoke to him about the scholarship I was offered and he said that God needs his people there too. When I went to church the next night, the preacher spoke about wasting the gifts that God has given you. The next morning, the day the decision was required; my wife told me that she knew it was God's purpose for me to go back to university.
So that is how I got here. I do want to stress; however, that I treat it like a normal job so I have time with my family (I have four children now).

What Influences you in what you do?

Often, we hear about composers and artist whose art is based upon their cultural belief; for example, Australian Aboriginal, Eastern philosophy, and even atheistic Darwinism. Islamic music, for example, is not even seen as music as an abstraction; but rather, it is seen as an inseparable part of worship. In our western culture, we often take music completely out of its original context and enjoy it as art. Bach's sacred cantatas are only one example of many. I believe that an attempt to abstract these aspects about myself without placing them in an ethno musicological context would be incomplete and possibly inaccurate.

Whether we like it or not, we all base what we do on what we see as fundamental truth. Even those who say "there is no truth" hold this as a truth within itself. They hold this as an absolute; and so I do the same with what I hold as truth. This is the case in all areas of life, including science (see www.answersingenesis.org for a great web site). All my music, art and instrument building is based upon the fundamental and literal truth of the Bible. I like to focus my music on the entire Bible, a fact blatantly obvious if you listen to any of my music (www.users.bigpond.com/angelo_f). My motivation for being an artist is fixed in the first book of the bible: Genesis. In the book of Genesis, we see the creative power of God, and all mankind created in that creative image. It says "So God created man in his own image, in the image of God he created him; male and female he created them" (Gen 1:27 NIV). This is the fundamental and literal truth I hold onto as an artist—all men and women have been created with the ability to bring into existence that which did not exist previously. This is creation out of nothing. This is very important as I believe this is the creative element of all people and is one of the things that differentiates us from animal—the fact that we can be artists. I believe other creatures, like birds that sing or dance, are like MIDI sequencers or samplers controlled by God's big Max patch, performing the art or music that has already been composed and programmed into them by the Master. We as humans, have the ability to be actual composers in life.

In looking at the justification for producing art, I had to find purpose for my art. When I was young, I was not allowed to play music at home. The only useful purpose was to work and provide for one's family. The concept of "Art for Art's sake" was not something I was brought up with. I used to think that

composers of computer music were people who were too lazy to actually do hard work or too unskilled to play a real instrument.

One might try to find a justification or purpose in music because it might make another person feel better, for example Music Therapy, but this is not "Art for Art's sake." The justification that I find for the concept of "Art for Art's sake" is in the Bible, where we read "And the LORD God made all kinds of trees grow out of the ground—trees that were pleasing to the eye and good for food"(Gen 2:9 NIV). The fact that they were pleasing to the eye validates aesthetic value—not just functional use. Another example was when Mary poured the perfume on Jesus' feet, which was criticised by Judas, but justified by Jesus (John 12:1-8). This demonstrated the validity of doing something beautiful. In asking "why did God create?" the answer is "you created everything, and it is for your pleasure that they exists and were created" (Rev. 4:11 NLT). This gives me justification to create artistic works and build instruments for my own pleasure. I believe that my design and building of the Smart Controller is an Artistic work within itself. The enjoyment of the creative process is justification, even if nobody else used the instrument. One ACMA member proposed that the Smart Controller would be a meaningless and purposeless pursuit in the context of "Creative Art" if it was not used in the context of a musical work or installation. I disagree with this with the very essence of my being. Although a few composers have used my Smart Controllers, and more than a few have used the Dumb Controllers, the validity of the creative process has nothing to do with the popularity of the instrument, commercial success, or even if the device works good enough to be confidently used by any other artists. I enjoy the creative element of making them simply for the pleasure of it. This is a balancing act for me as a Christian where we put Christ and then others before ourselves. In the film Chariots of Fire, Eric Liddell says "I believe God made me for a purpose, but he also made me fast, and when I run I feel God's pleasure" Later he says "To give up running would hold him [God] in contempt." The same is for me as an artist, composer, and instrument builder.

What are you currently doing?

Apart from trying to get my Ph.D. finally written up, the last few months have been particularly busy for me. I have just released an OSC to MIDI converter under the auspices of the Sounding Out initiative, released a new range of Mini-MIDI controllers, worked with Anne Norman on the Bell Garden in Melbourne, and written and presented an introductory electronics course for Rev at QUT. The new MIDI controller range enables people to have a low cost entry level CV to MIDI / MIDI to CV converter with an option to upgrade to wireless. The three days I spent with Anne resulted in me seeing her program the Bell Garden, with the Smart Controller playing back sequences mechanically on the Bells with a precision that I didn't expect. We used OSC to monitor what was happing with the bell stalks. Anne is going to be working with composers at the University of Wollongong in April this year, getting students to compose with the Bell Garden / Smart Controller.

The four day electronics course resulted in the students being able to design and build some sensors and understanding how they work (I'll see how much they really understood when I see their exam results). Although I could see that some brain cells started to smoke up toward, the satisfaction of being able to help these students get a foothold in electronic design is very satisfying.

Instead of doing this work with artists, I could have chosen to just write software for Quikscribe, which is what I do to feed my family. Making art costs me financially; however, my life is not my own—I believe it belongs to Christ. I believe whole-heartedly that I have a spiritual calling in this.

What you would like to see in the future?
I would like to see people having fun with what they are doing, being as creative as they can be. I have been particularly happy with the support that I have received from ACMA and I would like to see that continue, where we support one another as best we can. I have been really impressed with what happens at QUT, where they develop their own technology and foster usage within their own community. Last year, the Fraietta Discretionary Trust provided a prize at QUT that gave the most promising student the opportunity to start working with interactive instruments by wining a free Dumb Controller. This will happen again for the next two years. I would like to see more of this. UWS have started doing a similar thing in that they have bought

some Smart and Dumb Controllers from me, and have worked with some of those students. I am very excited about what might be happening in Wollongong now that they have Greg Schiemer, Warren Burt, and Julian Knowles. I'll check them out when I see them in April with Anne. I am very much for Australian made and Australian played, because that is who we are—Australians. In short, I would like to see one big family where we look out for and encourage one another.

I give my warmest regards to my fellow ACMA members and their families.

a c m a
australasian computer music association

Special Offer to ACMA members:

Angelo is taking $10 off the price of MIDI controllers for all ACMA members

http://www.users.bigpond.com/angelo_f

for product details

CLATTERBOX
Attention experimental instrument builders in Australia

clatterbox is undertaking a survey of people building experimental music/sound instruments in Australia.

Completing the survey is easy. Download the form at :
http://www.clatterbox.net.au/survey.doc

Fill out your responses and SAVE the form.

Email your SAVED form back to :
sean@clatterbox.net.au

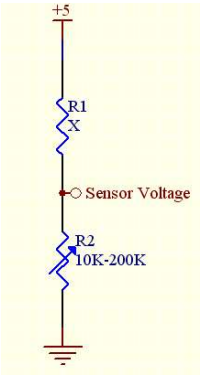
Your responses to this survey will help me continue to develop the clatterbox website and other possible projects.

Calculating the Optimal Fixed Resistor Value in Voltage Divider Sensor Circuits

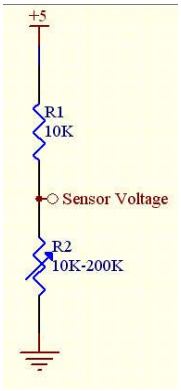
Angelo Fraietta, Toby Gifford, and Ashley Kelso

When making a sensor using a variable resistor, it is important to note that you are using a voltage divider network. The goal is to have the sensor generate the maximum possible voltage swing that can be input to you CV to MIDI converter. This in turn means that your CV to MIDI converter will be able to generate the maximum possible number of MIDI messages. For example, if the output swing is 0 to +5V, the converter will generate controller messages whose values are 0 to 127. If the voltage swing is from +2.5VDC to +5VDC, the converter will only generate controller message values from 63 to 127. This has effectively halved your resolution. (Although many CV to MIDI converters, including new ones purchased from me have a 10 bit scaling capability that would reduce the effect of this problem, the point is that you need to maximize the swing without increasing the rail voltages).

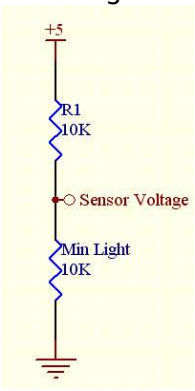
Let's say that we are building a sensor based upon a light dependant resistor (LDR) that you get from Jaycar. You measure the LDR with your multi-meter and it exhibits a resistance of approximately 10kΩ when under the maximum light, and a resistance of approximately 200kΩ when there is minimal light. We need to select a value for the fixed resistor R1 in the voltage divider circuit, which we will say has a value of X, as we have not calculated its value yet.



If we select a value for R1 of 10kΩ, let us calculate the range of voltage that we would read at the sensor point.



When the LDR has the maximum amount of light, its resistance is 10kΩ, resulting in the following effective circuit.



The value at the sensor, which is the voltage dropped by R2, is determined by the voltage divider

$$VR2 = V\frac{R2}{R1+R2}$$

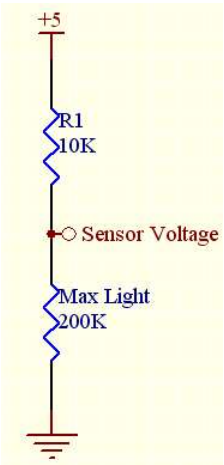
$$VR2 = 5\times\frac{10k}{10k+10k}$$

$$VR2 = 5\times\frac{10k}{20k}$$

$$VR2 = 5\times\frac{1}{2}$$

VR2 = 2.5V

Let us examine the LDR with minimum amount of light, causing R2 to be 200kΩ.



The value at the sensor, which is the voltage dropped by R2, is determined by the voltage divider

$$VR2 = V\frac{R2}{R1+R2}$$

$$VR2 = 5\times\frac{200k}{10k+200k}$$

$$VR2 = 5\times\frac{200k}{210k}$$

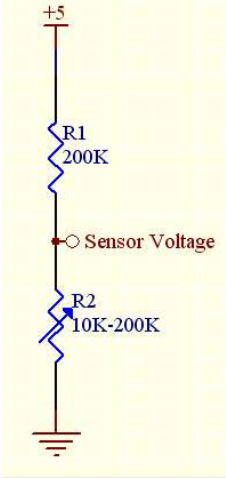
$$VR2 = 5\times\frac{20}{21}$$

VR2 = 4.76V

The voltage swing is therefore the voltage difference between the minimum light and the voltage at maximum light

Min = 2.5V, Max = 4.76V. The voltage swing is 2.26V—this is less than half.

Let us now calculate the voltage swing if we used a fixed resistor value of 200 kΩ.



At the maximum light, R2 = 10kΩ.

$$VR2 = V\frac{R2}{R1+R2}$$

$$VR2 = 5\times\frac{10k}{200k+10k}$$

$$VR2 = 5\times\frac{10k}{210k}$$

$$VR2 = 5\times\frac{1}{21}$$

VR2 = 0.238V

At the minimum light, R2 = 200kΩ.

$$VR2 = V\frac{R2}{R1+R2}$$

$$VR2 = 5\times\frac{200k}{200k+200k}$$

$$VR2 = 5\times\frac{200k}{400k}$$

$$VR2 = 5\times\frac{1}{2}$$

VR2 = 2.5V

The voltage swing is from 2.5V to 0.238V, which is approximately 2.26V—about the same as using a 10kΩ fixed resistor for R1.

The amount of voltage swing is effectively

$$V_{swing} = V_{\max} - V_{\min} = \frac{VR_2^{Max}}{R_2^{Max}+R_1} - \frac{VR_2^{Min}}{R_2^{Min}+R_1}$$

or

$$V_{swing} = V\left(\frac{R_2^{Max}}{R_2^{Max}+R_1} - \frac{R_2^{Min}}{R_2^{Min}+R_1}\right)$$

What happens if we pick a resistor value for R1 halfway in between 10kΩ and 200kΩ—say 105kΩ?

At the maximum light, R2 = 10kΩ, at minimum light, R2 = 200kΩ.

$$V_{swing} = V\left(\frac{R_2^{Max}}{R_2^{Max}+R_1} - \frac{R_2^{Min}}{R_2^{Min}+R_1}\right)$$

$$V_{swing} = 5\left(\frac{200K}{200K+105K} - \frac{10K}{10K+150K}\right)$$

This gives a swing of 2.84V, which is an improvement. Try one more value for R1: say 50kΩ.

$$V_{swing} = 5\left(\frac{200K}{200K+50K} - \frac{10K}{10K+50K}\right)$$

This gives a voltage swing of 3.16, which is much better than the original swing of 2.26V for R1 values of 10kΩ and 200k, and better than the value of 2.84V using a value of 105kΩ for R1. So how do we calculate what the optimum value would be for R1? There are at least two ways of looking at it. We can look in terms of the ratios between the R1, $R2^{Max}$ and $R2^{Min}$, or we can calculate the value using differentiation.

When we originally looked at the problem, we chose an alternate value of 105k, half-way between the 10kΩ to 200kΩ variable resistor range. We often think of this as the average value, being the sum of the values divided by the number of values. This is known as the arithmetic mean.

$$R_{arithmetic\ mean} = \left(R_2^{Max} + R_2^{Min}\right) * \frac{1}{2}$$

For example,

$$R_{arithmetic\ mean} = \left(200K + 10K\right) * \frac{1}{2}$$

This value equalled 105kΩ; it was found, however, that a value of 50kΩ produced a greater swing; and therefore, the arithmetic

mean is not the optimal value. This is because the swing either side of the central point is based upon the ratios between R1: $R2^{Max}$ and R1:$R2^{Min}$. Leon Battista Alberti (1407–1472) states "We shall therefore borrow all our Rules for the Finishing our Proportions, from the Musicians, who are the greatest Masters of this Sort of Numbers, and from those Things wherein Nature shows herself most excellent and compleat[sic]"; therefore, perhaps a musical analogy would be efficacious.

Imagine we have two musical notes, C^{Min} and C^{Max}. Suppose that C^{Min} is a middle C at 256 Hertz and C^{Max} is two octaves up at 1024 Hertz. What would you say is the note halfway between these? Would you take the arithmetic mean of 640 Hertz? More likely you would take the C at 512 Hertz which is one octave above C^{Min} and one octave below C^{Max}. This is because we tend to think of pitch on a logarithmic scale, which in turn is because our perception of pitch intervals relies on the ratios of the frequencies.

The situation with our voltage divider network is similar in that what determines the voltage at the sensor point is the ratio of R_1 and R_2, so in choosing the resistance 'halfway' between R_2^{Min} and R_2^{Max} we should take the halfway point on a logarithmic scale. This point is called the geometric mean. The geometric mean is like the arithmetic mean except that instead of adding the two values and multiplying by ½, the values are multiplied and the put to the power of ½.

$$R_{geometricmean} = \left(R_2^{Min} \times R_2^{Max}\right)^{1/2}$$

or

$$R_{geometricmean} = \sqrt{\left(R_2^{Min} \times R_2^{Max}\right)}$$

Relating this back to our musical analogy, 512 Hertz is the geometric mean of 256 Hertz and 1024 Hertz; the ratio of 256 : 512 is the same as the ratio of 512 : 1024 Hertz (they are both equal to 2).

So how do we prove that the geometric mean is the sweet spot? The standard approach to solving an optimisation problem such as this is to use differential calculus. Given a function y(x) the derivative $\frac{dy}{dx}$(x) of this function is the slope of the graph of y at the point x. If we are looking for a maximum value for y, then we need to look for a point where the slope of the graph of y is zero.

In our case we are seeking the maximum value of the Voltage Swing

$$V_{swing} = V_{\max} - V_{\min} = \frac{VR_2^{Max}}{R_2^{Max} + R_1} - \frac{VR_2^{Min}}{R_2^{Min} + R_1}$$

We will use the standard result that for a function of the form $y = x^n$ we have the derivative $\frac{dy}{dx} = nx^{n-1}$. This formula is valid for all values of n, even when n is negative. Considering the voltage swing as a function of R_1 we obtain

$$\frac{dV_{swing}}{dR_1} = -\frac{VR_2^{Max}}{\left(R_2^{Max} + R_1\right)^2} + \frac{VR_2^{Min}}{\left(R_2^{Min} + R_1\right)^2}$$

At our optimal point this derivative must be zero. Hence

$$\frac{VR_2^{Max}}{\left(R_2^{Max} + R_1\right)^2} = \frac{VR_2^{Min}}{\left(R_2^{Min} + R_1\right)^2} \text{ or}$$

$$\frac{R_2^{Max}}{\left(R_2^{Max} + R_1\right)^2} = \frac{R_2^{Min}}{\left(R_2^{Min} + R_1\right)^2}$$

Cross multiplying and expanding yields

$$R_2^{Max}R_1^{\,2} + 2R_2^{Max}R_1R_2^{Min} + R_2^{Max}R_2^{Min^2} = R_2^{Min}R_1^{\,2} + 2R_2^{Min}R_1R_2^{Max} + R_2^{Min}R_2^{Max^2}$$

Then collecting terms and solving for R_1 gives

$$R_1^{\,2} = \frac{R_2^{Max}R_2^{Min^2} - R_2^{Min}R_2^{Max^2}}{R_2^{Min} - R_2^{Max}} = \frac{R_2^{Max}R_2^{Min}\left(R_2^{Min} - R_2^{Max}\right)}{R_2^{Min} - R_2^{Max}} = R_2^{Max}R_2^{Min}$$

Therefore.

$$R1 = \sqrt{R2Min \times R2Max}$$

In the case of our LDR with a range of 10kΩ to

200kΩ, we get the following:

$$R1 = \sqrt{10k \times 200k}$$

$$R1 = (\sqrt{10 \times 200})k$$

R1 = 44.72 kΩ

Any resistance value for R1 greater or less than this value will give you a smaller voltage swing. The further away from the optimal value, the less your voltage swing.

Also when building your voltage divider sensors using variable resistors, don't forget to factor in any known input impedance into your calculations.

Upcoming events:

3rd Iteration Conference
November 30th to December 2nd, 2005 : Melbourne, Australia.
For more information about the conference and the call for works see:

http://www.csse.monash.edu.au/~iterate/TI/

ICMC 2005 - Free Sound
Barcelona, September 5-9, 2005

http://www.icmc2005.org

Thoughts on Volume: an Email Exchange with Robert Sazdov

Warren Burt
(WARNING: Adult Concepts)

Robert Sazdov, a composer who lived in Perth, and now lives in Sydney, wrote to me on 24 October, 2004. UoW is the University of Wollongong.

(Unedited email)
Dear Warren
I am hoping to apply for a doctoral program at UoW. [SNIP – irrelevant paragraph removed] Hope to have a chat on Friday night.
Regards Robert.

I replied to him, and, in a friendly, but intentionally provocative way, asked him about the volume levels he intended to play at. The Wellington referred to here is the 2004 Australasian Computer Music Conference which took place at Victoria University, Wellington, New Zealand at the beginning of July 2004.

(Unedited email)
Hi Robert!
[SNIP – irrelevant paragraphs removed]
Yes, let's talk on Friday night. Are you going to play as loudly as you did in Wellington? If so, I'll bring my professional earplugs. We were sitting in the first couple of rows in Wellington, and your piece felt like jack hammers on the skull, and pile drivers in the stomach. I don't think I've ever experienced the sonic equivalent of being in a domestic-violence relationship so vividly! In fact, it's been the reason I haven't talked to you much - I didn't know how to approach you, because I felt your music was so violent! (As you can tell, I have a problem with extreme volume in music - it's not just aesthetic, it's physical, personal, and political as well! :-)) But if you're friendly, I can be friendly too! All best wishes, and cheers - see you Friday night, Warren.

He replied to me, in an equally friendly and accommodating way. ACMC Perth was the 2003 Australasian Computer Music Conference, which was held at Edith Cowan University in Perth, Western Australia. Guilliaume is Guilliaume Potard, a research associate of the Faculty of Creative Arts at the University of Wollongong. He is in charge of research on the CHESS system, Creative Arts 16 channel experimental sound system.

(Unedited email)
Hi Warren
Thank-you so very much for the documents you forwarded! It was very informative and I have to say impressive to read through your application. I really don't know where to start in my answer regarding the piece performed in Wellington. Yes, I would have to agree it was loud and it was meant to carry a lot of high frequency energy. It was an attempt to portray the emotion of the subject matter and political stance. However, with the hall acoustics and other issues I won't bore you with, the frequency spectrum was vastly altered, further increasing those 'harsh' frequencies and projecting them in far more elevated manner. For the 2003 ACMC in Perth, which I hosted with Lindsay, I managed to secure sponsorship from KRK and set-up a 12.2 multi-channel system. With assistance from students I configured the speakers to adapt to various established multi-channel systems, tuned the systems, and ensure it 'sounded good' within the 'classical' acoustic space. The piece I performed sounded great. I guess spatialising within the set-up contributed vastly to the end result. Back to Wellington, during the sound check I tried to EQ some of the frequencies, however, it didn't translate within the space. To sum up it was a bit of a lesson on 'studio' to 'performance venue' translation. Also, Guillaume might still have the piece performed at this years Sonic Connections on the CHESS system. I am sure it won't have the same effect as the piece in Wellington and should give a better reflection of my musical personality. I assure you I am far from being a violent person! Passionate, politically minded, and opinionated, I am guilty of :) Earlier this year I interviewed legendary Japanese noise artist Merzbow for a new music show on community TV in Perth. I could hardly hear what he was saying due to his soft and inward personality. He was a complete contradiction in terms of musically output to personality. These days he dedicates his performances to his ducks and is actively involved in lobbing against KFC due to their treatment of chickens; he is also a vegan. His music was so penetrating, my ear plugs didn't help much as my ears were ringing all night/morning. For Tronicphosis I am planning on a loud, but not a harsh performance. I will be trying out some new techniques and approaches within a stereo environment and it is totally improvised - I will be selecting sound files minutes before I perform. To be on the safe side I would recommend ear plugs, particularly if the Bar has a big PA. Looking forward to your performance and hopefully a lengthy chat after!! Again, thank-you for the documents and taking the time to help out.
Regards Robert

I replied to Robert, and suggested that this correspondence could become an article of some kind, where the issue of volume in contemporary art music was discussed. Here is my reply:

(Unedited email)
Hi Robert!
Thanks for your reply. I'll look forward to talking on Friday, or at length another time, in more placid circumstances. Here's my current thoughts. You said "if the Bar has a big PA." That's the problem, isn't it? My class did their concert a couple of weekends ago. They applied for funding themselves. They wrote the music themselves. They played the pieces themselves. They did the publicity themselves. They did all the tasks, like budgeting, ushering, organizing venues themselves. Then they got "a friend" to come in, who had a sound system, and he put everything through it, and it all sounded the same, and it all sounded lousy, and at the very end, they gave control over that most trivial and inconsequential aspect of the whole thing, THE SOUND, to a guy who might as well have been a total stranger. Well intentioned he may have been, and less than 100% competent he definitely was, but giving up control over the sound like that is an absolute contradiction in what we stand for. Well, what choice do we have? might be the reply. The choice to bring our own sound system, the choice to work with a smaller sound system, the choice to perform in our own living rooms, the choice to do a hundred alternatives, rather than simply let the "sound man", who usually is a slightly deaf boy, govern what the audience actually hears. Of course, that might involve questioning the whole sociology of what we do when we do it. (I'm bringing my own computer monitors to the Unibar. I'm going to play through them. If it sounds anything like moderately adequate, I'm going to tell the sound person I'm not playing through their system. If my sound gets lost in the mix, it will just be like one of those violin lines in a Charles Ives piece which surfaces from time to time, then gets buried again in the mass. Big deal.) But there must be a way to get good sound, at reasonable volume levels, and a reasonable performance situation, without having to go the full institutional route of hiring a monster sound system in a big hall. I'm still working on this one..... By the way, I'm not totally against loud sound. Just last week, Catherine and I were at Stanwell Park station. A big freight train came roaring through - a 3 engine job. All the wheels of all the cars behind it were squealing with high frequencies that would kill a koala at 14 paces. Everyone, and I mean everyone at the station had their fingers in their ears. Man, talk about a sonic assault! Occasionally, Catherine and I would pull our fingers out of our ears for a second, maybe two. Magnificent. Amazing. Physical vibrating of the internal organs through sound. And it lasted, maximum, five minutes. And we had warning that it was going to happen (the whistle, the build up of the sound) so it was not a surprise. All in all, a great experience. Here's my dilemma.

1) An activity that causes people physical pain is a violent activity.
2) These activities are usually only done under consenting circumstances, otherwise they are considered violations. (Think of an S&M club - people go there to experience violence. But if, in the bar, someone punches someone

in the face in a brawl, they're still prosecuted for assault.)
3) If one's sound levels shear some hair cells off the inside of someones semicircular canals, and they lose part of their hearing, that is just as much an act of violence as if one were to punch that person. Remember, torture regimes that "leave no external marks" are just as much disapproved of as torture regimes that do.
4) Is a concert a "consenting circumstance?" I think not.
5) A concert is an occasion of trust. We give control over our aesthetic experience to someone else, on the grounds that we and they have created a special occasion for that to take place. Part of that special occasion is a trust that we have that violent acts will not be committed against us. (Participatory theatre where the actors would attack the audience would have the same problems.)
6) So the question then is: If electronic music becomes an art form that I usually have to protect myself against (because it will physically damage me), then why should I continue to participate in it?
7) If I do decide to continue to participate in it (because it's my aesthetic lifeblood), and I'm not willing to shut up, then what are the alternatives? Is debate an acceptable alternative? Is there room for debate on this issue in the electronic music community?

So that's my dilemma. It would be good to talk about this - maybe even have several people talking and record the conversation and transcribe it for publication in Chroma, or something like that.
Cheers, Warren

The concert took place, but Robert and I didn't have much of a chance to talk, of course, with all the rigmarole that doing a gig entails. A talk is in the future. But the afternoon before the gig, I decided to see how much a sound pressure meter actually cost. It turned out they were $50 Australian. So I bought one, and brought it to the concert. The average sound level during Robert's performance, by my meter, moving it to several different points in the hall, was 90 db, with the central section hovering around 100 db and the loudest part peaking at a sustained 106 db. (C weighting, with both slow and fast transient averaging.) The loudest act of the evening I measured was Ubercube, a duet of Emily Morandini and Monica Brooks - they started out at about 95 db, but soon moved to around 105 db with sustained loud sections at around 112 db. I didn't measure the duet of Aaron Hull and Julius Ambroisine, because at that point, I'd left my meter in my bag backstage, and they were so loud I just left the hall - even my 15db attenuation earplugs weren't enough for that. But even outside the bar, the sound was so loud it was frightening. I don't know what the volume of our trio (Gary Butler, Houston Dunleavy and myself) was, but I suspect that it wasn't that loud - I used small computer monitors - Gary used his guitar amp, and Houston played acoustic instruments through the PA - in fact, he was the only one of us who used the house PA. Both Houston and I occasionally left our seats and wandered through the audience, me playing on a battery powered mini amp, and Houston playing acoustically. Jim Denley played through the house PA - his average level was about 80 db, with occasional peaks at 90 db. During his piece, I noticed the house PA had a bad hum in it. After his piece, I measured the hum. It was 72 db, constant. That's the volume of a normal person talking constantly. During most of the performances, the sound man hired for the night would leave the desk. During Robert Sazdov's piece, he played cards with his friends. Between the pieces, he played recorded music, which averaged at 100db in volume.

When I pointed out to people that 85 db was the legal limit in industry before hearing protection was required, and that 90 db is defined as the beginning of dangerous volume by the US Dept. of Labor Noise Regulations, mostly, they acted sheepish, and tried to make throwaway comments. Or they took the comment seriously, but with that sort of conceptual shrug that says, But what can we do about it? One young man asked me if I drank, the implication being, I think, that just as drinking is a consensual activity where you know you re doing something dangerous, but you do it (hopefully) in a controlled and responsible fashion, so was going to hear loud sounds a similarly consensual but potentially dangerous activity. I was eager for him to pursue this line of argument, but when I told him I didn't drink any alcohol, he simply broke off the conversation and went to talk with another friend. So much for debate.

The following morning, even having worn earplugs throughout most of the gig, I had a tinnitus in my left ear so loud that it was louder than the external sounds coming in. This prompted me to write the following, a development of the dilemma I expressed to Robert above.
1. The ear is a part of the body.
2. The hand is a part of the body.
3. If someone offers me a handshake, and I

accept, I trust them not to, either accidentally or intentionally, crush my hand and break my fingers.

4. If they do violate me in this manner, and crush my hand or break my fingers, this is considered assault, and legally, I can sue them, and ethically, I believe I would be entitled to thump them. (Although with a broken hand, my ability to thump them might be severely diminished!)
5. If someone offers me their sound to listen to, I trust them not to, either accidentally or intentionally, play at such volumes that they shear hair cells off my inner ear and contribute to my loss of hearing or painful experience.
6. If they do violate me in this manner, I would consider this assault (though the law might not), and following the analogy above, I should feel entitled to sue them, or thump them.
7. Or let's try a sexual analogy. If a male places their penis into another persons orifice without their consent, or any person of any gender places their fingers, or other implement, into another person's orifices without their consent, this is considered rape, and the person doing it is a sex offender, and they, if convicted, are place on a register of sex offenders and prevented from having certain types of employment in the future.
8. If someone places their sound into my aural orifice, at such volumes that they, without my consent, cause physical damage to me, can I consider this sonic rape , and am I entitled to prosecute, and demand that they be put on a register of sound offenders ? The language may be (intentionally) inflammatory, but I believe the analogy holds. If it doesn't t, I d like to hear from someone why it does not.
9. To reiterate a point made above - if the damage caused by loud sound is internal, and not visible, does this make it any less noxious than damage which is visible? Again, taking the example from war crimes tribunals - torture which damages internal organs, but leaves no visible marks, is still considered illegal, barbaric, and cruel.
10. These arguments could even be extended to friendship - if someone physically violates my hand or my orifices, I would find it difficult extending the trust of friendship to them. Why is it, that if someone violates my ears, I am still expected to be friendly with them? If I can't trust them with my ears, can I trust them with other parts of my body? Am I the only one who thinks that people should be responsible for their actions, and consistent in the application of ethical principles in their lives?

I admit that these may be extreme positions, but feel that taking them is a good way to define the terms of the debate. I would now like to send this out to people for comment, to see if they feel there is any point in debating this issue. Or, if there is not, and playing at dangerous volumes is now a fact of life in art music (computer music, electronic music, improvised music - call it what you will), and the only response is to shut up and take it , or to wear hearing protection to all gigs (a precaution which I find insulting and the necessity for it indefensible), can anyone tell me why I should not withdraw totally from that scene, and refuse to attend events given by or even interact socially with any members of that scene? I await your responses.
30 Oct 2004

Warren Burt A Post Script - the biological implications of volume.

Having bought my sound pressure meter, my wife Catherine wondered what different pressure levels felt like. Watching the meter, I talked to her, adjusting my voice so that it registered 60db, 70db, 80db, 90db, and 100db. Each time I said This is 60db or This is 70db etc. two or three times for each level. Except for 100db. That took so much effort I could only say it once. The interesting thing was, that even though I tried to say This is 100db in as friendly a manner as I could, it still came out as if I was yelling at her in anger. The necessity of putting a lot of air pressure behind my speaking (or yelling, in this case) to be able to reach 100db meant that I totally lost control of the emotional tone of my voice. This made me realize that the only non-mechanical sounds we hear that are over 100db are either warnings, expressions of extreme emotion, or natural forces beyond our control. In the case of natural forces, like a volcano or a waterfall, the continuous loudness is a warning for us not to get too close. In the case of warnings and expressions of extreme emotion (yelling in anger, a huge whoop of joy, etc.) they are all very short expressions, limited by the breath capacity of the person making them. It was only with the rise of mechanically made sound (the organ (or hydraulis), invented about the 2nd century

BC; or the railway engine, invented about the 1830s) that we began to hear humanly produced sounds which were loud, continuous, and whose duration was not limited to the breath capacity of a single person. So when we use very loud sounds, and do so in a sustained manner, we are, consciously (or unconsciously) violating what might be called the natural hearing behaviour of the human animal , that is, the pre-mechanical way hearing developed over years of evolution. This might not be a bad thing to do - mechanics (and its more recent extension, electronics) allows us to do things the body can't otherwise do. But when doing so leads to us damaging ourselves, then I think we have to ask if the reasons for violating our natural hearing behaviour are sufficient to justify the danger inherent in doing this. Also, I think we have to be aware of the emotional implications of our acts. In the 1970s, the Belgian composer and instrument inventor Godfried-Willem Raes made an instrument called Bellenorgel. It was a set of telephone bells, door bells, warning claxons, etc. They were controlled by a series of telephone relays, so that the order of the bells was always unpredictable. He found that rather than being fascinating, or beautiful, it was almost impossible to listen to the instrument. This was because all the sounds he had used were warning sounds. Each announced the intrusion of the outside into our private space. This was sometimes heard as a threat, sometimes as an annoyance. So no matter how interesting his patterns, or how beautiful the sounds were, in the end, the emotional implications of the bells won out, and hearing the machine felt like a perpetual threat, or at least, an unending state of uneasiness. In the case of extreme volume, if one is using it, one should be aware that usually the only conditions we would hear something that loud would be situations of threat or danger. If one wants an audience to experience a different emotional state than threat, danger, or being dominated through the use of volume, one might be justified in making a public statement before playing alerting the audience that extreme volume was about to occur, and that one hoped the experience would not entail hearing sounds of that volume as a threat. This might involve, again, changing the nature of the social ritual of music making, but I think it's a change well worth making. In any case, as biological beings, we are not free of our history, and if we are going to use extreme volume, we should be aware of what our biologically inbuilt responses to high volume are.

Initial comments from Paul Doornbusch and the editor in regards to questions raised by Warren's debate:

Hearing damage is very real. Even classical and orchestral musicians suffer regularly from noise induced hearing loss. How much more are we at risk when we use amplification in the primary sound production stage.

Clubs in some US cities now must have sound level monitoring and various other public protections in place. The sound level standard is the same for Australia, 85dB average level is the limit for 8 hours of sustained exposure before hearing loss, 88dB for 4 hours, and 91dB for 2 hours.

What is ACMA's responsibility to the audience? Do we need to monitor the levels at our concerts, and reduce or limit those levels if they exceed an acceptable level? Does artistic license outweigh moral obligation?

Time to think and discuss.

Some related web links:

http://www.nohsc.gov.au/smallbusiness/businessentrypoint/hazards/noise/default.htm

http://www.worksafe.gov.au/index_search/default.asp?qu=noise

http://staff.washington.edu/rneitzel/standards.htm

http://www.whs.qld.gov.au/safetylink/noise/noise04v1.pdf

http://www.aafp.org/afp/20000501/2749.html

http://www.hearnet.com/index.shtml

http://www.hearnet.com/images_site/energizer/hip_to_hear_survival_guide.pdf

Music From the Once Festival 1961-1966

New World Records 80567-2
5 CDs, with book

Reviewed by Warren Burt

How we create our history – what we chose to remember, and what gets written about; what gets preserved, and what is spoken about for years afterwards – is an interesting topic. Many factors figure in whether someone's work is available after they do it – proximity to places which disseminate information, their participation in a "scene", what their later career was, how many people heard their work at the time, economic factors, etcetera. Having information freely available on the Internet has been hyped as a distinct change – in theory, anyone can have a web-presence, but in reality, getting people to have access to the net, and then to actually experience something before the files are removed from the server, or the URL changes, actually is as difficult as any of the pre-Internet methods of making things known. History and fame remain fickle, if not capricious, beasts. It's still true what Chris Mann said back in the 1970s: "Historically, all we're left with is the mystification of gossip."

In the early 1960s, a group of young composers, film-makers, architects, theatre people, and performance artists, congregating in Ann Arbor, Michigan (where most had some sort of affiliation – often an informal and occasionally antagonistic one – with the University of Michigan) put on a series of concerts, events, and performances called ONCE. News about this festival travelled widely. There was even an LP available called "Music from the ONCE Festival" which many music students of the time probably heard, and articles about the festival appeared in various new music publications. Then, in the flurry of day to day activity that occurs, music kept moving, and changing, and people, even the ONCE composers and artists, went on to do other things. Some of them even achieved what passes for fame in the new music world. If the names of Robert Ashley, Gordon Mumma, and Roger Reynolds are not exactly household words for the larger classical-and-other-art-musics scene, they ought to be. And anyone serious about new music should be familiar with at least some aspects of their work. But the ONCE festivals themselves seemed to have passed out of sight, living as memories, stories, articles, and tapes on the participants' shelves.

Now, however, New World Records has brought out a handsomely produced 5 CD set, featuring 35 of the more than 170 works that were performed over the 7 years that events were produced under the ONCE banner. Accompanying the CDs is a 137 page book, with a long, meticulous, and information-packed essay by Leta E. Miller, lots of photos of the events and the participants, and program notes and composers' reminiscences by Ashley, Mumma, Reynolds, and Donald Scarvada. As history, the set is invaluable. As information, it's a wonderful and rich resource, and as music to listen to, I personally found almost every piece to be engrossing and engaging.

What comes across mostly from the book and the CDs is the sense of enthusiasm that the participants had. These participants included the public, whose occasional reactions can be heard in these (mostly) live concert recordings. Although some of the recordings have the odd flaw, and a few of the performances are less than highly polished, for the most part these are very high quality recordings and performances, and its great to finally be able to hear and enjoy (yes, very much enjoy) them.

The core of the ONCE group were five composers, four of whom are still with us, and producing work of importance. George Cacioppo died unexpectedly in 1984, but the others, Reynolds, Ashley, Mumma and Scarvada, are still very much alive, and very much kicking. Other composers also featured on the programs. Some, like David Behrman, Pauline Oliveros and Robert Sheff, are quite well known today. Others, like Philip Krumm and George Crevoshay, are not. And one composer, Bruce Wise, on the basis of the works heard here, should be known far more widely than he is. His works constituted for me one of the delightful finds of the set.

In the late 50s, the five central composers began to discuss with each other and their artist friends, such as the radical light artist Milton Cohen, and the avant-garde film maker George Manupelli, the need to put on their

own events, in order to hear both their own music, and the music of others they wanted to hear. Inspired by two older composers – Roberto Gerhard, who visited the University in the early 60s, and Ross Lee Finney, who taught there from the 40s until the 80s – the group, operating on a shoestring, but with contacts in the new music scene of the time (which meant they were able to get professional groups to visit for very little money), put on their first festival in 1961. They were uncertain of success, or whether they would even continue doing this kind of thing – hence the group's name. (Ashley says it was his young son Sam who came up with it.) But to their surprise, audiences came (around 1500 to the 1964 festival!), paid admission, and eventually, they found they had almost covered all their expenses. A local arts organization, the Dramatic Arts Center, came to the rescue with a small grant to cover the difference between income and expenses. This arrangement continued for the next 7 years, with the DAC hosting the event, and bailing out the few hundred dollar loss that each festival incurred.

The works on the first CD, from the first festival, are very representative of what young "avant-garde" composers world-wide were doing at the time. In fact, I don't think it would be ungenerous of me to say that if they had all stopped composing after the 1961 festival, their works, as competent and interesting as they are, would largely be remembered only as promising early works, and that's it. It was the development of their work after this first festival, often in quite amazing directions, that would guarantee their importance. However, even with these works (almost a paradigmatic collection of opus 1's), there is much to listen to. For example, Donald Scarvada's "Groups for Piano", a five movement, one minute work for solo piano,(its brevity was controversial at the time) is full of rapid contrasts, and exciting shapes and changes of direction. The work of the ONCE group fell into three related categories: music for acoustic instruments, electronic music, and theatrical works. It's interesting to hear works in one category from composers who have mostly become known for work in another. For example, Robert Ashley might be best known for his operatic, and music theatre work, but his electronic and instrumental works here are luminous and full of interest. And Gordon Mumma, for those who mainly know his electronic works, unexpectedly reveals himself here as a chamber music composer of delicacy and sensitivity. During the 3rd movement of his "Sinfonia for 12 Instruments and Magnetic Tape", where the instruments fade out as the tape enters, I suddenly found myself delightfully disoriented. I had been listening to acoustic instrument sounds. Then the tape sounds entered. Suddenly I realised that I was listening to a sound world that was radically different from the world of acoustic instruments, but I couldn't recall how I could have gotten there. This kind of timbral sensitivity and interplay was most inspiring to hear. Other skills also surprised. For example, many of the piano works in the set are played by Robert Ashley, who modestly states "I was a relatively good pianist." He was more than that – his control of dynamics and rhythm was almost of the calibre of the virtuoso new music pianists David Tudor or Paul Jacobs. His performances here, of his own "Sonata" or Roger Reynolds "Epigram and Evolution" are astonishing. One of the most underrated of the ONCE composers was George Cacioppo. He was one of the most traditionally oriented of the ONCE composers, in that his work mostly dealt with various kinds of acoustic instrumental music, but his experiments with graphic notation and form were as cutting edge as anything else happening at the time. His "String Trio" is a work I have returned to several times in the course of this review, and each time the work seems richer, and a source of greater pleasure. The first CD also contains a bonafide electronic music classic, Robert Ashley's "The Fourth of July". Made in his home studio – he and Mumma set up their own studios at a time when that was a truly remarkable thing to do – it consists of environmental recordings which cross fade into amazingly sophisticated electronic sounds and sequences. "The Fourth of July" is a work which every young composer – especially those who are now setting up their own home studios in software, should hear.

With the second CD, and the works of the 1962 festival, however, works of real importance begin to emerge. Each composer also begins to reveal their own distinctive voice. Donald Scarvada's "Matrix" for clarinet is a gorgeous and pioneering work. The first piece dealing exclusively with clarinet multiphonics, it's as "electronic" and timbrally oriented a piece as any of the works here produced with circuitry. This piece started a

genre. While listening to it, I thought to myself, "So it still IS possible to change the world, or at least a small part of it. All it takes is a remarkable work like this." Roger Reynold's "Wedge" for orchestra gets a stirring performance by the ONCE Chamber Orchestra. The performances here are much more confident and assured than the previous year, as well. Reynolds' work, to my ear, clearly owes a debt to Ives and Varese, but his own distinctive voice is beginning to emerge. For readers of Chroma, the electronic works will most likely be of greatest interest. There are plenty of them here, and they're all worth hearing. Gordon Mumma's "Meanwhile, a Twopiece" combines dark, thickly textured electronic sounds with piano and percussion work by Robert Ashley, with Mumma himself on French horn and percussion. The piece uses a variety of graphic notations, and the performers move from place to place on the stage as they perform, providing a multi-coloured soundscape that is still exciting today. Other works on this CD are also impressive. Both Mumma and Ashley explore pointillist, sparse textures in their piano duets "Gestures II" and "Details (2b)". This kind of very open, one-sound-at-a -time kind of texture normally doesn't appeal to me all that much, but in these pieces, I found it to be very moving and incredibly beautiful. Another work that combined silences alternating with very intense sounds was Scarvada's "Sounds for Eleven", which grabbed my attention and held it from beginning to end. George Cacioppo's "Bestiary I: Eingang" is a lyrical work for soprano and chamber ensemble that, while reminiscent of Webern, features an expanded timbral pallette that became the hallmark of chamber works composed in this era. In fact, Cacioppo's anticipation of instrumental usage that became common in the new music world in Europe in the 1980s is almost uncanny. Finally, the disk includes an early piece by Robert Sheff, who later became "Blue" Gene Tyranny, now known for his folksy, rock-and-conceptual-art influenced narrative sound pieces. His pieces in the ONCE festival, though, show a quite different side of his personality, with their intense explorations of timbre, breath, and quiet texture.

With so many rich and appealing works to choose from, it's hard to know which works to mention in a review, and which to leave the listener to discover for themselves. The third CD has works mostly from the 1963 festivals. George Cacioppo's "Pianopieces"are quite remarkable. Each of the three movements is notated differently, including the classic graphic score "Cassiopeia", which has been reproduced in a number of anthologies. What is most interesting for me is how the rhythmic "feel" of each movement changes. The use of different notational systems, with a sensitive player, does produce musically different results. If this was "experimental music", then in this case, we can unqualifiedly say that the experiment was a success. And in Cacioppo's "Two Worlds", he explores many instrumental sounds where the instruments are played with sufficient pressure to produce crunching, grinding, rasping, unstable textures. The discovery of these kinds of unstable sounds were the beginning of Cacioppo's later exploration of chaos and non-linear systems in music, an interest where, again, he anticipated concerns of the new music scene of the 80s and 90s. Gordon Mumma has three pieces on this CD, all dealing with different issues. His "Large Size Mograph" for piano is a transcription of seismographs. Information from one system - geology - is applied to another - piano music. His "A Quarter of Fourpiece" for flute, oboe, French horn and double bass reveals once again his ability to write elegant chamber music. I remember the bassist Bertram Turetzky once telling me that he regretted that Mumma had not kept up this side of his work, as he found his chamber music most rewarding to play. In "Greys", Mumma produced a fascinating exploration of a single kind of echoing tremolo-like sound. This piece, too, along with Ashley's "Fourth of July", deserves to be known by everyone studying the history of electronic music. What is also interesting about this piece is its use in the festival - it was intended as a soundtrack for Donald Scarvada's film "Greys", the first of a series of abstract films, continuing to this day, in which he intends the film to be used as a score for performers. His "Concerto for Orchestra" (2003) is a recent example. In these days of DVD productions, might it be too much to hope that someday, a DVD of performances of this, and other of Scarvada's films/scores might become available? Line honours for the most profound and affecting piece on this CD has to go, though, to Roger Reynold's "A Portrait of Vanzetti", for narrator, chamber ensemble, and stereo electroacoustic sound, in which Reynolds pays homage to the unjustly executed 1920s anarchist Bartolomeo Vanzetti. This is a fully mature work, in which all of Reynolds' later interests are already

present. The use deeply meaningful texts, edited by the composer from the works of literary figures, the use of the narrative voice, the use of elegantly produced and spatialised electroacoustic sound, a glittering orchestration, and a feeling that "this is as serious as your life"are all aspects of Reynolds' works of the past two decades, and they're all here in more than embryonic form. This is an important work, moving and engrossing. Anyone who could put this work down as "more of that old fashioned modernism" in my view, has rocks in their head. As well, because of the visual nature of the theatrical side of the ONCE group, not much of it is represented here, so it's good to have Reynolds work here as an example of ONCE's theatre work.

The fourth CD, which features works from the 1963 and 64 festivals has two remarkable works by lesser known members of the group. Phillip Krumm's "Music for Clocks" is a chamber music work that opens with various fractured loops of sound, all out of synch with each other, making a very jaunty sound. In the second half of the piece, the loops slow down, and become unmeasured, creating sound textures that slip and shimmer over each other with a nervous grace and lightness. Robert Sheff's "Diotima" is an unusual work, in that it's for magnetic tape and flute, and not the other way around. That is, the work consists several long sections of electronic sound, which are connected by shorter solos on the flute. The electronic sections also contain silences designed to "erase memory" in the piece - dissolving any sense of progression that might emerge. The piece ends with 63 repetitions of a two second tape loop. This, in a piece which had no repetition in it previously, is another way in which Sheff is exploring non-linearity in that most time-based and linear of media, music.

The final CD, with works from 1964-66, opens with an absolutely amazing work that kept me on the edge of my seat all the way through it's half hour length. "Music for Three" by Bruce Wise is a work for two performers (here Ashley and Mumma on pianos) and magnetic tape. The work features some thrilling piano work, an amazing tape part and some of the most interesting uses of distortion I've ever heard. I immediately asked myself, "Who is Bruce Wise, and why haven't we heard more of him?" He is, apparently, still composing - a CD containing some of his work was released in the mid-90s, and has recently retired after a lifetime of teaching. On the basis of this work alone, I want to hear more of his work. George Cacioppo's "Time on Time in Miracles" completes the transition from Cacioppo's first works, which were pitch oriented, to his work of the mid-60s, in which timbre was the most important factor. It's a classic, and should be heard more often. David Behrman, who later became known as one of the most important composers working in the area of performer interactivity with electronics, is represented here by a work for magnetic tape and chamber ensemble. The tape part consists of concrete sounds of various sorts, and excerpts from radio, movies, and television. The muffled quality of these contrasts quite sharply with the very live and upfront recording of the interjections from the ensemble. Pauline Oliveros is represented by an improvised live electronic duet with David Tudor, called "Applebox Double". Both performers play amplified wooden boxes to which a variety of objects - springs, metal tongues, etc. are attached. Given the interest in the early work of both Oliveros and Tudor that younger electronic performers are showing these days, this searing, soaring work is one that should receive a lot of airplay and be heard by many. Robert Ashley's "Quartet", is performed in a realisation for clarinet, two French horns, and six soft speaking (reading) voices. In its use of extended tones accompanied by textures made with the human voice, it already points the way to the electronic and music theatre works, such as "In Sara, Mencken, Christ and Beethoven There Were Men and Women" and "Perfect Lives", that Ashley would make his name with in the 1970s and 80s.

In summary, this is an important set, one that not only documents a big slice of modern music history, but one that has a lot of great listening in it as well. Reading the book, looking at the photos, and hearing the music, one gets at least a flavour of what it must have been like to be there in that period. ONCE was not the only game in town then (equally compelling events were also happening in New York, in England, in Europe, Japan, and at other places in American such as the University of Illinois), but it was one of the most important things that was happening, and to have all this material available once again is a delight. If you want to hear music that not only contains the seeds of much of

what we're doing today, but which is gripping and involving in its own right, you should listen to these CDs much more than once.

(Footnote: Ashley's "In Sara, Mencken..."etc. has recently been re-released in a deluxe edition by Lovely Music (LCD 4921). If you like Ashley's work on this set, you'll love this piece. For those of us who were students in the early 1970s, the appearance of this work of Ashley's was of paramount importance.)

Impossible Nature: The Art of Jon McCormack

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Jon McCormack is a pioneering Australian computer artist, working particularly in the area of generative art, that is art where the artist creates a process (typically a computer program) which in turn generates all or part of the artwork. His major works have been interactive installations, notably ***Turbulence*** (1994) and ***Eden: Evolutionary Sonic Ecosystem*** (2000). The book and DVD under review are a celebration of McCormack's art.

I will discuss the DVD first. It contains information about four works: ***Turbulence***, ***Universal Zoologies***, ***Eden*** and ***Future Garden***. It does not contain the works themselves, as all four of them are interactive installations, and in fact ***Future Garden*** remains in the future; it was intended for Federation Square in Melbourne, but the funding evaporated. Unfortunately I have not been able to see any of these works in their installed form, so I am relying on the accounts in the book.

Turbulence consisted of fairly short video segments, computed in advance, which the viewer of the installation could call up using a touchscreen. The video segments contain complex animations of imaginary plants (and one or two animals) "evolved" by software McCormack wrote for the purpose. The DVD contains a number of the sequences. ***Universal Zoologies*** also had precomputed video sequences, but as part of a more complex installation involving other projections and a computer-generated conversation, and the sequences on the DVD were only visible when wearing special glasses. I think that the information on the DVD does not give any real idea of this work, whereas some of the animations from ***Turbulence*** are really striking.

The other two works are more unified, each consisting of a single generative process. ***Eden*** is a simulated ecosystem populated by virtual creatures which can move around, prey on each other, mate, and evolve over time. The creatures make sounds, and in time evolve to recognise and make use of the sounds emitted by other creatures. The video element is deliberately simple and quite abstract, so much of the interest is in the sound. The installation is equipped with sensors which can determine approximately where people are standing; creatures which attract people are rewarded with an increased supply of food. ***Future Garden*** was intended to be installed in an outdoors part of Federation Square and to look something like a flower bed. It would contain a large cellular automaton under a touch-sensitive glass surface. The automaton would react to touches, but also slowly evolve autonomously. The DVD contains some still images showing how the work would appear in its proposed setting.

These works make use of so-called artificial life techniques. Artificial life as a scientific discipline consists mainly of computer simulations of greatly simplified models of aspects of life, notably evolution, but also growth of animals and plants, cooperative behaviour among ants and humans, and many other things. The triumphant slogan of artificial life is "life as it could be" (Langton 1991). Part of the aim is to gain insight by running "what if" calculations: for instance, what if there were three sexes instead of two? Would there be any evolutionary advantage? McCormack is one of a select group of international artists using the ideas and techniques of artificial life; the recent book by Mitchell Whitelaw (Whitelaw 2004) surveys the field, and includes a discussion of McCormack's work.

Now to the book under review. Firstly, what it is not. It is not a coffee-table book, being in a small format, though quite generously illustrated. It is not a biography, containing only a couple of paragraphs about McCormack himself. It is emphatically not a how-to book, as it contains no technical information at all. The book is in fact an "art monograph", a series of essays discussing the aesthetic and philosophical implications of McCormack's work. Four of the essays are by McCormack himself, written at various times from 1995 to 2004. In addition there are three more contributions, from Alan Dorin, a long time collaborator, from Jon Bird, an artificial life researcher from the University of Sussex, an institution at which McCormack has worked, and from Annemarie Jonson, an Australian academic and writer on new media. The book is rounded out with brief descriptions of several of McCormack's works, an impressive list of his screenings and exhibitions, a bibliography with more than 20 entries of writings about McCormack's work by other people, a brief glossary, and a combined bibliography for all the essays.

There are several common themes in the essays; I will mention three here. The first is the human alienation from, and destruction of, nature. Human activity has affected every corner of the planet; there is no wilderness any more; city dwellers encounter animals, if at all, in zoos, or, even further distanced, in nature documentaries. Yet we seem to need the natural world. If it is denied us, can generative art provide a fulfilling replacement? Alan Dorin argues cynically that the average viewer will not clearly distinguish between a shot of a blue whale (which is), a reconstruction of a dinosaur (which was), and a creature from ***Turbulence*** (which is purely virtual). To a casual eye, they are all "documentary".

A second theme is that of "emergence": when the system appears to give more than was put into it; when the results of the system cannot be predicted from knowing the components and interactions. Whatever exactly emergence is (there is no agreed definition), it is sought by artists and artificial-life researchers, but is difficult to achieve. It certainly involves letting go of control. Bird discusses the "evolved radio", a general purpose circuit which was subjected to an evolutionary process and evolved the unexpected ability to detect radio waves. As McCormack points out, if creative behaviour emerges in artificial systems, would we recognise what the systems create as art? Art-as-it-could-be created by life-as-it-could-be?

The third theme I will mention is that of the sublime (which is related to the other two themes). The sublime in nature is the aestheticisation of fear. A tiger next to us is terrifying; a tiger in a safe environment, such as a safari park, is sublime. Aspects of generative art can be sublime: an out-of-control process whose behaviour, if emergent,

is by definition unpredictable, may indeed have frightening aspects. Even the name "artificial life" is alarming. But we know the generative art we are seeing is just coming from a personal computer and a video projector.

There are many other themes, and fascinating asides, in the book. I do feel that by sticking to the "art monograph" format, an opportunity has been missed. I understand that a monograph dealing with a painter, for instance, does not need to discuss paint or brush strokes in any detail, as most people more or less know what they are. But most people, most artists, and even most computer artists do not understand how generative art functions. I would have liked to have seen on the DVD a segment showing the generative process for one of the creations in ***Turbulence***, giving some of the evolutionary stages, and some examples of the choices that had to be made. I think such a segment would enable a better appreciation of McCormack's remarkable work, which I suspect is undervalued because of a general lack of understanding of the generative process.

Despite this omission, the book is very valuable for anyone who wishes to engage seriously with generative art. The discussion of aesthetic and philosophical issues is important, as it explains to a large extent why anyone would create such artwork in the first place. Get the book for your library!

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