Portfolio of Compositions

by

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Abstract

This portfolio of 19 compositions includes several short commissions intended to reach new listeners and address issues of sustainability and copyright. Two of the pieces are studio works, one of which makes use of field recordings and SuperCollider and the other of which is almost entirely analogue synthesis. Three pieces are performance works. One is a combination of live realisation and gestural control, designed to play in front of an audience of hackers. One is an N-channel work, designed for live realisation on the BEAST system. The last is an excerpt of live analogue synthesiser improvisation, using SuperCollider to manage panning. Some of the above pieces use glitches as an aesthetic choice. The last two pieces are written for BiLE, a laptop ensemble which follows the organisational model of The Hub. I developed a software library, BiLETools, for solving problems related to group laptop performance. Both BiLE pieces use live sampling, one of percussion. The other uses voice and is intended to be a live Text Sound work and is the second act of a laptop opera, *The Death of Stockhausen*.

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0. Introduction

One of the advantages of undertaking a PhD is the relative freedom afforded to a composer. While at Birmingham, I was free to explore several different ways of making music and therefore have a diversity in the kinds of pieces that I produced. These include studio compositions, solo performance pieces, and frameworks for performance and improvisation with BiLE. This also includes software libraries which have been publicly released.

Although my pieces vary in duration from one minute to twenty minutes and include studio pieces, live pieces and ensemble pieces, what they all have in common is an exploration of structure and the gestures contained within it, from the micro level of the short pieces, to the macro level of the score for Act 2 of the laptopera. My pieces tended to increase in duration throughout my studies. I began with one minute pieces, which focused on small composed gestures. Then I wrote longer pieces with gestures generated according to computer algorithms. I ended with larger improvisational pieces which left individual gestures unspecified in structural scores, but have an emphasis on shared and traded gestures.

Another common feature in my pieces is an exploration of strategies to engage listeners. This is especially apparent in my short pieces, my improvisation and *Phreaking*. McNabb writes, "As far as I am concerned there is not only no beauty, but no art at all other than instilling an experience of some kind in one's audience" (McNabb, 1986, p. 142). With this in mind, I undertook a project wherein listeners could commission me to write new music, as a way of increasing listeners' personal sense of investment in the music. My synthesiser improvisation also seeks to engage listeners by adding elements of unpredictability, something that is also present within the BiLE pieces.

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Over the course of my studies, I created two software libraries for SuperCollider. One of these is in the TuningLib quark (SuperCollider Developers, n.d.), including an implementation of dissonance curves (Sethares, 2005) which includes a novel method for picking scale steps based on just intervals between partials. I used this in several pieces, including *Silicon Valley by Rail* and *Blake's 9*. The other is a networking library for BiLE, which is used in all pieces that BiLE performs, including two in my portfolio: *Partially Percussive* and *The Death of Stockhausen.*

1. Short Commissions

When I started at Birmingham, I was in the midst of a project where in I was soliciting commissions for pieces of music of around one minute in length. My plan was originally to compose 45 of these in total and release an album at the end. I intend to pick up where I left off and finish the project after graduating.

This project was an attempt to get a bit of attention and to address some economic and political issues of music distribution. The amount of music available to consumers via the internet is staggering. There are more than 14 million songs available to download on the iTunes store (Apple, 2010), with new material added daily (Wikipedia, 2012). Furthermore, a producer's cost of providing copies to consumers is practically nil. Any composer can upload an mp3 to Last.fm or Bandcamp at no cost (Last.fm 2012 and Bandcamp, n.d.).

Because copying and distribution is so cheap and easy, consumers often share files without paying for them. The Recording Industry Association of America (RIAA) struck back against this by suing fans (RIAA, n.d.), an idea which seems to me to be poorly thought out and which has made them extremely unpopular (Reisinger, 2008). At the same time, the duration of copyright keeps being extended, seemingly so that Mickey Mouse will never fall into the public domain (Springman, 2002). What used to be a system to make sure that creators got their fair share is increasingly perceived as a way for big companies to control culture (Lessig, 2004, p. 61). Rather than adapt to new conditions, media companies are lobbying for new laws to force the genie back in the bottle (ibid, p. 48). Some of these, like the Digital Economy Act are fairly draconian in that households may have their internet switched off if only one member of the household breaks copyright law

(Digital Economy Act 2010 s.10). Despite the severity of this crackdown, many are sceptical it will make any difference (BBC News, 2010). It is my opinion that rather than adapt to changing conditions, powerful, politically-connected media companies are abusing state power. Their position is morally bankrupt and their claims of victimhood are laughably overstated. The RIAA tells students that sharing an mp3 is worse than maritime hostage-taking: "It's commonly known as 'piracy,' but that's too benign of a term to adequately describe the toll that music theft takes . . .." (RIAA, n.d.) Even composers and those working in the industry are becoming increasingly dubious about copyright law. Music critic, Alex Ross recently called the situation "ludicrous" (Ross, 2011).

From my perspective, it seems clear that copyright is in crisis and in need of a major reform. However, this crisis of copyright does not diminish the notion of authorship. Those engaged in online music sharing still are deeply invested in *who* created the work they are copying. Artists that chose to participate in Open Culture models, such as Creative Commons, are not ceding their work to the public domain, but instead protecting the rights of their fans (Creative Commons, 2011). An artist choosing this model may be potentially sacrificing some forms of revenue, but for most emerging artists, getting heard is far more important than protecting rights which *may* one day generate income. Even for successful artists like Bob Ostertag, this income has failed to materialise. He writes, "selling recordings in whatever format has been a break-even proposition at best" (Ostertag, 2007).

However, artists still need to eat and pay rent. Sustainability is a major concern, but economic support for non-mainstream composers has not come from record labels. Indeed, they have historically worked against the interests of composers. In 2001, composer Judy Dunaway wrote:

Of course, the recording industry does not care at all about contemporary and experimental music. The sales figures on such CDs are miniscule compared to popular music. In the words of Foster Reed at the New Albion label, "The corporate recording industry lives in a completely different world, of commodity and markets, than the independents do, who make and publish work that is near and dear to them." But accessibility to innovative music on the internet may be blocked by the record industry's rush to protect and maintain total control of its own high-profit intellectual property. (Dunaway, 2001)

Composers are thus left to their own devices when it comes both to generating revenue and to attracting listeners. Without a budget for publicity, one of the best ways to gather attention is by word of mouth "buzz." Social networking is one venue where this can happen, which has the advantage of the possibility of fast transmission and direct links to online content. I suspect people may be motivated to share music they like or find interesting because it gains them cultural capital. They would thus take on a curatorial role and hope to gain the respect of their friends and social contacts. A musician interested in using this as a path to wider recognition would need to create music that works in an online context. For example, he or she might want to include video content, so it can be uploaded to YouTube or create music that the sharer will identify with in some way. They may also produce music with the goal of having it sound good in stereo mp3 format out of home speakers. This has previous precedent. In her 2001 album, *Vespertine*, Björk specifically sought to create "music for laptop speakers" (Pytlik, 2011). Similarly, commissioned music should be engineered for the playback environment in which it is expected to be heard. The music created must also be accessible in some way, although obviously an artist wishes to remain interesting.

In my case, I chose duration as my most accessible component. All of my pieces in this project are around one minute long. At the time, it seemed to me that very short pieces of music were in vogue,

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especially the 60x60 Project (Vox Novus, n.d.). However, the duration was otherwise useful. I strongly suspect that if you ask most people to listen to ten minutes of noise music, they would refuse unless they were already fans of the genre or the composer. However, in my experience, people are much more willing to sacrifice a minute of their time. Many more people are going to be willing to listen to very short pieces. However, just because people will listen to something does not mean they will share it. I thought sharing would be more likely to occur if listeners felt connected to the music in some way. One way to get that feeling of connection was to get a listener to commission me.

The commissioner gets their name attached to a short piece of music, which becomes integrally linked to them. The piece of music would not exist if it were not for their financial involvement. This in return gives them cultural capital. They are the proprietor of a new piece of music. This also solves the dilemma of sustainability. The commissioning amount should cover costs, at least. The commissioner would be motivated to share their new piece of music as far and wide as they can, as every re-sharing increases their own cultural capital. Instead of fighting the online sharing that people seem inclined to do, this model requires it and does not require coercive action on the part of the state.

This idea is an example of crowdfunding. "Crowdfunding involves an open call, mostly through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of reward and/or voting rights" (Belleflamme et al., 2011, p. 7). This model's roots lie in music. It was first used by the rock band Marillion (Caetano et al., 2001, p. 6) and first coined to describe the Sellaband website, which was founded to help bands find money (ibid, p. 4). Crowd funding functions as a form of patronage, and was proposed specifically in response to problems of copyright (ibid, pp. 6-7). I chose not to use the term "crowdfunding", however, and used the term

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"commissions" instead in order to create an association between my work and art music of previous centuries.

I started by using eBay as my sales platform. This allowed me to control how many commissions I might sell at a time and handle the monetary transaction, and the platform itself made the commissioners feel engaged and interested some music bloggers (Foley, 2007). Much to my surprise, a bidding war erupted on one of my early offerings, despite the promise of many more to come. The price climbed above $45. However, before that bidding war could conclude, eBay terminated my account, banning me from the service. They refused to tell me why they had done this, so I do not know if it was because they suspected fraud or because they objected to my business model. I moved to Etsy.com, a much less exciting web store.

I started by charging $10 USD, then raised my prices to 10€, then raised them again to £10. This price is far below the rate suggested by the Canadian League of Composers (CLC) which is $510 CAD per minute (CLC, 2011). I wanted to price commissions as consumer items. For the price of an album, the purchaser can have something unique. I was also influenced in this by the visual artist Steve Keene who sells five paintings for $30 (Keene, n.d.), as consumer items, which he compares to CDs. (ibid) He works very quickly, "[painting] roughly fifty paintings at once, . . . using an assembly-line technique" (Higgins, 2010).

While, obviously, I could not exactly copy this model, when I started, I spent an hour on each piece, thus paying myself an almost liveable wage. However, as I went on and got more accustomed to working within a very short duration, I spent progressively more time on each piece. I found that a minute began to seem longer and longer. A composer could easily fit over a hundred discrete events

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in a minute. By the time I moved on, I was spending at least four hours per piece and often longer. While I could not possibly live off of this income, I did make slightly over $300 USD.

During the course of my project, several people did share their short pieces via their blogs, Facebook or another online medium. One person used her piece as her ringtone. In 2008, I approached a popular blogger, Josh Fruhlinger of *The Comics Curmudgeon* and asked if he would trade me advertising space for a free commission. His blog had been ranked #13 by PC Magazine's "100 Favorite Blogs for 2007" (Heater, 2007) and won a Webby Award in 2008 for Best Humour Blog (Aylward, 2008). His blog was also popular with composers and was mentioned on Kyle Gann's blog (Gann, 2007) and others. Fruhlinger agreed to this plan and I composed a short piece related to the American comic strip Gil Thorp (Rubin et al., n.d.). In order to cope with the expected server traffic, I created a very simple video of the face of the titular character slowly zooming in with the piece as soundtrack and uploaded it to YouTube. My small advertisement ran for a week and then Fruhlinger made a post specifically about the piece. He was very positive, using words like "stunning" and "masterpiece" (Fruhlinger, 2008). The video got 4000 views in a very short period of time. However, despite how happy Fruhlinger was and some positive comments from his readers such as, "I stand amazed" (commodorejohn, 2008), this got me no new commissions.

Does this mean that the model fails? I had predicted that I would get some new commissions out of such a high profile endorsement, but did not. There are a few possible explanations. Consumers may be unused to the idea of commissioning a composer. In my brief stint working in marketing, I was told that consumers do not absorb an idea until they encounter it multiple times. This was just one post. Or, conversely, it could have been their lack of familiarity with me. A better known composer may have fared better. It may also have been the economy, which was not doing well at the time and has since become worse. By using the terminology of "commissioning music," I

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situated my compositions as a luxury product that might seem eccentric and easy to forego.

Marketing this project is actually quite difficult. I found I could do three commissions in a week. It would be impossible for me to cope with the volume that mass-market success would imply. Therefore, targeting high-profile general subject bloggers is not the way to draw in new customers, as success could be a worse disaster than failure. However, it is a way to draw in new listeners. Most of the visitors to the blog would not have heard my piece otherwise. My attempts at an accessible duration did pay off, even if social media buzz did not gain me new commissions. Making a piece for one person motivates that one person to share it, but it does not seem to motivate his or her friends to share it also or to commission new pieces of their own.

Musically, I was interested in very short pieces because of the 60x60 Project (Vox Novus, n.d.), in which I participated in 2005. I found it extremely frustrating to make a piece so short. While my piece *Clocker* had been accepted, I did not feel happy with it. I started listening to very short pieces, for example, tracks from the albums *Haikus Urbanis* (1997)*,* which is a compilation, and *Snakes and Ladders* by Slaw (2002) to get into the right mindset.

When constructing my very short pieces, I found it best to have three closely related ideas, and three overdubbed mono tracks. A minute is too long to only have one idea, but too short to go through much material. There is also limited time for major density changes, unless that is the focus of the piece. However, as noted above, there is time for a surprisingly large number of discrete events.

In my portfolio, I have included several of these pieces. I created many of them using analogue

synthesis or processing, usually from either a Sherman filter bank, small Evenfall MiniModular synthesiser or a much larger MOTM modular. Those pieces are:

Shorts #15: Space Corridor

Commissioned and titled by Graham Coleman.

Shorts #16: Delaware Covered in Red Velvet

Commissioned and titled by Matt Davignon.

Shorts #20: Poodleface Birthday

Commissioned by Graham Coleman.

Shorts #23: Gamut

Commissioned and titled by Devin Hurd.

Shorts #24: College Promo

Commissioned and titled by Jean Sirius.

Shorts #28: Untitled

Commissioned by Cecile Moochnek.

Shorts #29: Raining Up

Commissioned and titled by Autumn Looijen.

Some pieces mix acoustic recordings with analogue synthesis:

Shorts #22: For Benjamin Britten

Commissioned and titled by Michael Strickland.

Shorts #25: Untitled

Commissioned by Scott Wilson.

Shorts #27: Gil Thorp

Commissioned and titled by Josh Fruhlinger.

And some used SuperCollider or other digital processing or synthesis:

Shorts #21: Anarchy and Rapture

Commissioned and titled by Polly Moller.

Shorts #26: Ecstatic Rivulet

Commissioned and titled by Clyde Nielsen.

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The programme notes for these and all my other pieces are located in the first appendix.

2. Longer Studio Pieces

Silicon Valley by Rail

In 2009-2010, I wrote a drone piece using the sounds of trains that I recorded in the San Francisco Bay Area, whilst on a visit home. The trains of that area sound very different than British or European trains. The whistles are distinctively different and are sounded much more often. Trains are required to blow their whistles at every road crossing (Howell, 2009), of which there are many. Also, many of the trains between San Francisco and San José ring physical bells when coming into a station. The trains themselves are loud and clatter over their tracks. They have an almost anachronistic sound to them. However, San José calls itself the "Capital of Silicon Valley" (Reed, n.d.). It strikes me as ironic that a place with so much technology can have such antique-sounding trains.

Some of my recordings were done at stations to capture the train bells, and others at a rail crossing, where the bell sounds come from the crossing gates rather than the train. At the time I recorded these sounds, there was an especially high number of suicides (Kyriakou, 2011) and there were rumours that drivers were blowing their whistles more loudly and frequently than normal in order to alert iPod-wearing pedestrians that a train was coming; however, this seems not to be true (Howell, 2009).

I used heavy effects on the recordings, processing them with SuperCollider and then adding reverb with a plugin in Audacity. My SuperCollider processing included a comb filter, the tuning of which was based on the FM drone running underneath the samples in the first half. The carrier, modulator and depth were all random numbers, for which a tuning was generated, using dissonance curves (Sethares, 2005). The second part of the piece also uses FM synthesis and dissonance curves, but

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there it is based on a spectral analysis of a bell sound in one of the samples. Analysing bells has precedent in Jonathan Harvey's piece *Mortuos Plango, Vivos Voco* (1980), in which he analysed the tenor bell of Winchester Cathedral (Harvey, 1981, p. 22). In order to calculate the dissonance curves for FM, I first needed to calculate its spectrum, which requires a Bessel function. I subsequently added this function to the MathLib Quark for SuperCollider (SuperCollider Developers, n.d.). My dissonance curve code was partly ported from William Sethares's code (Sethares, n.d.) and is now part of the TuningLib Quark, which I put together using this, some of my other tuning code and code from Jascha Narveson (SuperCollider Developers, n.d.).

Of course, pieces made with train sounds date back to the very beginnings of electroacoustic music. Pierre Schaeffer composed *Etude aux chemins de fer* in 1948 and numerous others have since found inspiration in trains. However, I had been listening to quite a lot of drone music when I was working on this piece. Drone was invented by La Monte Young in his piece *Trio for String*s in 1958 (Young et al., 2002), but I was more influenced by contemporary pieces such as *Elegy for Joh*n by Dave Seidel (2009). I tried to utilise the same kind of haunting sound. Like many recent drone pieces, its movement and structure are largely centred on the tuning system. Seidel uses just intonation for his piece (Seidel, 2009). While my piece does not, a "noninteger carrier to modulation ratio" (Sethares, 1993) does imply a "nonharmonic timbre" (ibid) better suited to the use of dissonance curves. The use of non-equally tempered tunings seems common in drone music. "Drone queen" Ellen Fullman (Warburton, 2004), for example, uses just intonation with her Long String Instrument (Fullman, 2006, p. 596) and builds music based on the harmonic structure of the tuning (ibid, p. 595). Her piece *Duration* (1986), is based on a 13 limit tuning (Pogus Productions, n.d.). "The intention of the piece was to listen to the variations within each chord, as it is sounded continually" while the overtone structure varies (ibid).

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In contrast, drone artist Phil Niblock's pieces are "densely microtonal" (Straebel, 2008, p. 226). Niblock's music avoids rhythmic structure, but "careful attention is given to frequency relation of the sounds that are present" (ibid, p. 227). In his 1974 piece *3 to 7 – 196*, he arranges the frequencies of the left and right channel so that the spaces between the closest pitches are 3 – 7 Hz apart (Straebel, 2008, p. 227). "This way , the composer ensures that the most prominent, slow beating patterns occur between the two channels, in space" (ibid, p. 227). My piece also pushes into microtonal territory by adding 10,11 or 12 Hz to the carrier frequency in either channel.

Detuning the left and right channel of an audio file listened to on headphones causes a listener's brain to perceive a 'binaural beat' which is the frequency difference between the two channels. This frequency, "if sustained," can cause changes to the listener's brain waves which are measurable on an EEG and can cause major changes in emotional state (Padmanabhan et al., 2005, p. 874). Delta waves, for example, which are less than 4 Hz (ibid, p. 876) have been found to reduce significantly anxiety in stressful circumstances (ibid, p. 874). I picked my range of detuning because of its association with alpha waves, which research has shown can also be induced via binaural beats (Foster, 1990).   These alpha waves "may increase . . . relaxation" (Lane et al., 1998, p. 249). My goal in referencing an alpha state and in the heavy processing of the train sounds is to create a dream-like feel for the piece. Also, as noted by Straebel, it does create a slow beating between the channels, although he makes no claims regarding emotional state. I have used this effect before in a piece I wrote during my MA studies, called *Morpheus' Snare.* That piece has a wider range of detuning, wandering between 2-20Hz. I wanted to narrow the range for *Silicon Valley by Rail* to place the detuning entirely within the alpha range.

Analogue Variations
Also in 2009 - 2010, I wrote my second studio piece in response to a call for recordings which was for analogue produced sounds only. "The use of computer or any digital device (except a DAW for

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the tracking/mixing) is <u>not allowed</u>" (Synesthesia Recordings, 2009). I ended up finishing the piece several months after the deadline so despite the specific mention of "no SuperCollider," there is a bit of automated cutting in the middle section. I could have obtained the same effect "by hand" in a DAW or with analogue tape but at the cost of significantly more studio time. Aside from that, all the sounds in the piece are created and processed with analogue hardware.

I started with some recordings of my MOTM analogue modular synth and recorded them to disk. Then I put them back through the synth to get recordings of the transformed sound. Then I put some of those through a Sherman filter bank. I kept re-processing sound in this way and filled up several gigabytes of my hard drive with AIFFs. In the past, when I have made synthesiser pieces, instead of re-processing sounds, I have recorded different patches that sound like they should be made to go together. This was the first time I built a piece entirely out of smallish bits of transformed source material. Of course, this is a quite common technique in electroacoustic music and is present in *Klang* by Jonty Harrison (1982), for example. When I was a student at Sonology, Kees Tazelaar encouraged students in the analogue studio to compose in this way. He also distributed copies of Koenig's instructions for realising *Terminus* (1962), which includes a significant amount of reprocessing of recorded sounds. I found that using the same material, but with substantial transformations, held the piece together as something diverse yet unified.

While I was trying to assemble the piece, Scott Wilson, my supervisor, reminded me that it is often wise to write the end first. I cannot recall if I did the start or the end first, but I definitely left the middle for last and it was the section that gave me the most difficulty. The first part of the piece was based on round swells of sound and the last section was these same sounds, but processed to be much more rough. I needed to write something that would make the similarities of the sections seem clearer than the differences. I had recordings of some of the source sounds that had been cut

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into pieces using AM synthesis with a sub audio square wave for the modulation frequency. I wrote a programme that cut the recording of these during moments of silence and then played them back at different speeds, building a texture. This is a process I had used before with Text Sound pieces, in order to cut up and rearrange human speech.

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3. Live Solo Pieces

Phreaking

When a local hacker group, 2600, started organising BrumCon 2007, which was so behind schedule that it took place on 3 May 2008, I asked if I could present a musical set. They had never done such a thing before, but they agreed. The group has its roots in phone phreaking (Trigaux, 1998), so I decided to reference that in a piece written for the gig.

As noted in *The Complete Hacker's Handbook,* "phone phreaking" refers to the practice of hacking phone systems in order to get free calls or just explore the workings of the system. Phone systems used to be controlled by in-band signalling, that is, audible tones that a user could reproduce in order to gain unauthorised control. For example, 2600 Hz was a useful tone to "seize" control of a line. Other such sounds commonly found in telephony are Dual Tone Multi Frequency [DTMF] sounds, which are the ones produced by a landline keypad (Dr. K., 2000).

I looked up red box phreaking on Wikipedia and also DTMF signals and used those tones as the heart of the piece. It starts with a dial tone, then does coin dropping sounds, followed by the sound of dialling and then a ring back sound, followed by a 2600 Hz tone. After that introduction, it plays dialling signals and then a beat. The beat is made up of patterns of sampled drums. The programme picks random events to be accented, which will always have a drum sound on them and then scatters drum sounds on some of the other beats also (see Table 1).

Beat	Loop 1	Loop 2	Loop 3
0		click	hat
1	kick, hat	tom	
2	**snare, kick**	**kick**	**hat**
3	**snare, kick, hat**	**kick, tom, click**	**hat**
4	snare, hat	kick, tom, click	hat
5			
6		kick, tom, click	
7	**snare, kick, tom**	**kick, click**	**hat**
8	hat	click	
9	kick, tom		kick, hat
10	snare, kick, hat, tom	click	hat
11	kick, hat	click	
12	**snare, hat**	**kick, click**	**hat**
13	**snare, hat**	**kick, click**	**kick, hat**
14		tom, click	kick, hat
15	hat	tom, click	
16	**snare, hat**	**kick, click**	**hat**
17	hat		
18	kick, hat		
19	**snare, kick, hat**	**kick, click**	**hat**
20	**snare, kick, hat, tom**	**kick, click**	**hat**
21	snare, hat	click	
22	snare, hat	click	
23		kick, tom	hat
24	hat, tom	kick, tom, click	kick, hat
25	snare, kick, hat	tom	
26	hat	click	
27	**snare, kick**	**kick, click**	**hat**
28	kick, hat	tom	
29	kick, hat		hat
30			hat
31	snare, hat		
32		click	
33			
34	snare, kick, hat, tom	tom, click	
35	kick, hat	click	

Table 1: Three example event loops. Accented beats are in bold.

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The loop is repeated between 8-10 times and then a new pattern is created, retaining the same accents for the duration of the piece. If the randomly generated drum pattern seems too sparse or too full of beats, the performer can intervene by pressing a joystick button to add some drum beats or another to remove them. The idea for randomly accenting beats comes from a lecture by Paul Berg at Sonology in the Hague where he noted that listeners tend to perceive accents of random beats as a deliberate rhythm. This is related to Trevor Wishart's discussion of Clarence Barlow's "indispensability factor," where Wishart notes that changing accents of a synchronous stream of events can cause listeners to perceive changes in time signature (Wishart, 1994, p. 64). It seems that greater randomness in picking accents leads listeners to perceive more complex rhythms.

After the beats, a busy signal comes in occasionally. There are also bass frequencies which are DTMF sine tones transposed by octaves. Finally, there are samples of operator messages that are used in the American phone system. These are glitched and stuttered, the degree of which is controlled with a joystick. Thus, this piece is partly a live-realisation, self-running piece and partly controlled by a performer.

At the time, I was interested in making computer pieces that necessarily had to be computer pieces and could not be realised with live instruments or with an analogue synthesiser. Extremely exact tunings and sample processing are both examples of things that are computer-dependant. I was also interested to have more live control and more visible gesture, in order, as Paine describes in his paper on gesture in laptop performance, to "inject a sense of the now, an engagement with audience in an effort to reclaim the authenticity associated with 'live' performance" (Paine, 2008, p. 4). I thought that having physical motions would engage the audience more than a live realisation. Conversely and relatedly, I was also interested in the aesthetics of computer failure, within the glitches I was creating. Cascone writes, " '[Failure]' has become a prominent aesthetic in many of

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the arts in the late 20th century, reminding us that our control of technology is an illusion, and revealing digital tools to be only as perfect, precise, and efficient as the humans who build them" (Cascone, 2000, p 13). I thought this intentional highlighting of imperfection would especially resonate with an audience that largely worked in a highly technical and professional capacity with computers.

I also find glitches to be aesthetically appealing and have been influenced by the extremely glitchy work of Ryoji Ikeda, especially works like *Data.Matrix* (2005), which is a sonification of data (Ikeda, n.d.). Similarly, in-band signalling is literally a sonic encoding of data, designed for computer usage.

When I performed the piece at BrumCon, their sound system did not have an even frequency response. Some sine waves sounded much louder than others and I did not have a way to make adjustments. I suspect this problem is much more pronounced for sine tones than it is for richer frequencies. Another problem I encountered was that I was using sounds with strong semantic meanings for the audience. Many of them had been phreakers and the sounds already had a specific meaning and context that I was not accurately reproducing. Listeners without this background have generally been more positive about the piece. One blogger wrote the piece sounded like a "demonic homage to Gaga's *Telephone*" (Lao, 2010), although he did note that my piece was written earlier.

Blake's 9

The music of the BBC Radiophonic Workshop has been a major influence on my music for a long time. The incidental music and sound effects of *Doctor Who* during the Tom Baker years was especially formative. I found time in 2008 to watch every episode of *Blake's 7* and found the sound effects to be equally compelling. I spent some time with my analogue synthesiser and tried to create

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sounds like the ones used in the series. I liked the sounds I obtained, but they were a bit too complex to layer into a collage for making a piece that way, but not complex enough to stand on their own. I wrote a SuperCollider programme to process them through granular synthesis and other means and to create a piece using the effects as source material, mixed with other computer generated sounds.

The timing on a micro, "beat," and loop level are all in groups of nine or multiples of nine, which is why I changed the number in the piece's title. I was influenced to use this number by a London poet, Mendoza, who had a project called *ninerrors* which ze[*] describes as, "a sequence of poems constricted by configurations of 9: connected & dis-connected by self-imposed constraint. Each has 9 lines or multiples of 9, some have 9 words or syllables per line, others are divisible by 9. **ninerrors** is presented as a series of 9 pamphlets containing 9 pages of poetry" (Mendoza, n.d.). I adopted a use of nines not only in the timings, but also in shifting the playback rate of buffers, which are played at rates of 27/25, 9/7, 7/9 or 25/27. The tone clusters frequencies also are related to each other by tuning ratios that are similarly based on nine. I was in contact with Mendoza while writing this piece and one of the poems in hir ninerrors cycle, *an obsessive compulsive disorder*, mentions part of the creation of this piece in its first line, "washing machine spin cycle drowns out synth drones" (Mendoza, 2009).

While ratios based on nines gave me the internal tunings of the tone cluster, I used dissonance curves, as described by William Sethares in his article "Relating Tuning and Timbre" (1993), to generate the tuning and scale for the base frequencies of the clusters. The clusters should therefore sound as consonant as possible and provide a contrast to the rest of the piece, which is rather glitchy. The glitches come partly from the analogue material, but also from sudden cuts in the

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[*] "ze" and "hir" are gender neutral pronouns

playback of buffers. For some parts of the piece, the programme records its own output and then uses that as source material, something that may stutter, especially if the buffer is recording its own output. I used this effect because, as mentioned above, I want to use a computer to do things which only it can do.

In his paper about glitches, Vanhanen writes that their sounds "are sounds of the . . . technology itself" (Vanhanen, 2003, p. 47). He notes that "if phonography is essentially acousmatic, then the ultimate phonographic music would consist of sounds that have no acoustic origin" (ibid, p. 49). He classifies skips as "metasounds" (ibid, p. 49). They have a physical cause, but they do not refer to a sound source outside of the technology itself. He thus asserts that skips and "deliberate mistakes" (ibid, p. 49) are the essential sound of "phonographic styles of music" (ibid, p. 49). Similarly, "glitch is the digital equivalent of the phonographic metasound" (ibid, p. 50). By this reading, glitch is necessarily digital and thus is inherently tied to the use of a computer. Cascone, by contrast, calls glitch " 'post-digital' because the revolutionary period of the digital information age has surely passed" (Cascone, 2000, p. 12). He situates glitch not within computers in general, but within specific digital tools.

Although my use of glitch is outside of the normal BEAST style, the piece was written with the BEAST system in mind. The code was written to allow N-channel realisations. Some gestures are designed with rings of eight loudspeakers in mind, but others, notably at the very start, are designed to be front speakers only. Some of the "recycled" buffers, playing back the piece's own recordings were originally intended to be sent to distant speakers, not pointed at the audience and thus give some distance between the audience and those glitches when they are first introduced. I chose to do it this way partly in order to automate the use of spatial gesture. In his paper on gesture, Paine notes that moving a sound in space is a form of gesture, specifically mentioning the BEAST system

(Paine, 2009, p. 224). Although Paine links an audience's experience of the authenticity of a performance to live human gesture, I think that because this gesture is already physical, it does not necessarily need to rely on the physical gesture of a performer moving faders. Removing my own physical input from the spatialisation process allowed me more control over the physical placement of the sound, without diminishing the audience's experience of the piece as authentic. It also gives me greater separation between sounds, since the stems are generated separately and lets me use more speakers at once, thus increasing the immersive aspect (ibid, p. 226) of the performance.

Although this piece is entirely non-interactive, it is a live realisation which makes extensive use of randomisations and can vary significantly between performances. This kind of live realisation, called "computer generative music" by Collins (2008), has numerous precedents, such as Clarence Barlow's Autobusk programme (2000), described as a "a modal and metric pitch and rhythm generator " (Jette, 2009, p. 10) and Thor Magnusson and Runar Magnusson's *SameSameButDifferent v.02* (Magnusson and Magnusson, 2008). I chose to do this in case I get additional chances to perform *Blake's 9* on a large speaker system, I would like the audience to have a fresh experience every time it is played.

Synthesiser Improvisation
When I was a student at Wesleyan, I had my MOTM analogue modular synthesiser mounted into a 6' tall free-standing rack that was intended for use in server rooms. It was not very mobile, and was therefore impractical for gigs, but it was visually quite striking. When my colleagues saw it, they encouraged me to do a live-patching concert. I was initially resistant to their suggestions, as it seemed like a terrible idea, but eventually I gave in and spent several days practising getting sounds quickly and then refining them. In performance, as with other types of improvisation, I would find

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exciting and interesting sounds that I had not previously stumbled on in the studio. Some of my best patches have been live.

I am deeply interested in the music of other composers who do live analogue electronics, especially in the American experimental tradition of the 1960s and 70s. *Bye Bye Butterfly* by Pauline Oliveros (1965) is one such piece, although she realised it in a studio (Bernstein, 2008, p. 30). This piece and others that I find interesting are based on discovering the parameters and limits of a sonic phenomenon. Bernstein writes that "She discovered that a beautiful low difference tone would sound" when her oscillators were tuned in a particular way (ibid, p. 30). Live patching also seems to be music built on discovery, but perhaps a step more radical for being performed live.

Even more radical than live patching is *Runthrough* by David Behrman (1971), which is realised live with DIY electronics. The programme notes for that piece state, "No special skills or training are helpful in turning knobs or shining flashlights, so whatever music can emerge from the equipment is as available to non-musicians as to musicians . . .. Things are going well when all the players have the sensation they are riding a sound they like in harmony together, and when each is appreciative of what the others are doing" (Behrman, 1971a). The piece is based entirely on discovery and has no set plan or written score (ibid). The piece-ness relies on the equipment. Scot Gresham-Lancaster describes pieces like this one as "direct use of electronics as a 'score' " (Gresham-Lancaster, 1998, p 40). This is different from live-patching because a modular synthesiser is designed to be a more general purpose tool and its use does not imply a particular piece. Furthermore, understanding the interaction between synthesiser modules is also a specialist skill and does imply that expertise is possible. However, the idea of finding a sound and following it is similar.

Recently, I have been investigating ways to merge my synthesiser performance with my laptop performance. The first obvious avenue of exploration was via live sampling. This works well with a small modular synthesiser, like the Evenfall Mini Modular, which is small enough to put into a rucksack and has many normalised connections. It has enough flexibility to make interesting and somewhat unexpected music, but is small and simple enough that I can divide my attention between it and a laptop. Unfortunately, mine was damaged in a bike accident in Amsterdam in 2008 and has not yet been repaired.

My MOTM synthesiser, however, is too large and too complex to divide my attention between it and a laptop screen. I experimented with using gamepad control of a live sampler, such that I did not look at the computer screen at all, but relied on being able to hear the state of the programme and a memory of what the different buttons did. I tried this once in concert at Noise = Noise #19 in April 2010. As is often the case in small concerts, I could not fully hear both monitor speakers, which made it difficult to monitor the programme. Furthermore, as my patch grew in complexity, the computer-added complexity became difficult to perceive and I stopped being able to tell if it was still working correctly or at all. A few minutes into the performance, I stopped the computer programme entirely and switched to all analogue sounds. While the programme did not perform in the manner I had intended, the set was a success and the recording also came out quite well and is included in an appendix. One blogger compared the track to Jimi Hendrix (Weidenbaum, 2010), which was certainly unexpected.

When I play live, I am exploring how my sounds behave in that particular space. If I discover that I can make the subwoofers shake the room or make the stage rattle, or discover another acoustic

phenomenon in the space, I will push the music in that direction. This strategy is more directly employed by Gordon Mumma in *Hornpipe* (1967), which uses an electronic device to tune amplifiers to "the resonances of the performance space" (Mumma, 1974, p. 75). The gates of these amplifiers are controlled by a horn player who, over the course of the piece, "learns the constellation of resonances of that particular space" (ibid, p. 75). Alvin Lucier's piece *Vespers* (1971) also explores the physical and sonic parameters of a performance space using echolocation (Lucier, 1971a) and his piece *I Am Sitting in a Room* (1969) engages resonances more directly by using feedback via a long delay line (Lucier, 1969a).

While my explorations are exciting to play, and hopefully to hear, they do not tend to come out well on recordings. I also have a persistent problem with panning. On stage, it is often difficult to hear both monitors and judging the relative amplitudes between them requires a certain concentration that I find difficult to do while simultaneously patching and altering timbres. In order to solve this problem, I have written a small programme in SuperCollider which monitors the stereo inputs of the computer and pans them to output according to their amplitude. If one is much louder than the other, it is panned to centre and the other output slowly oscillated between left and right. If the two inputs are close in amplitude, the inputs are panned left and right, with some overlap. I think this is the right answer for how to integrate a computer with my synthesiser. Rather than giving me more things to think about, this silently fixes a problem, thus removing a responsibility. The panner I have coded is fairly abrupt, which I think works well with the noise genre and also makes it obvious to listeners that there has been a non-analogue intervention. A five minute video excerpt of the premier performance is included in the portfolio and the entire audio track is included in an appendix.

In February 2011, there was a very brief discussion on the TopLap email list as to whether live patching was an analogue form of live coding (Rohrhuber, 2011). Live coding is typically a form of

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musical performance where a programmer writes a music-producing programme in front of an audience (Collins et al., 2003). I do not think that live patching is strictly a form of live coding, partly because a syntheiser patch is more like a chainsaw than an idea (TopLap, 2010). That is, a synthesiser is not a general purpose tool in the same way that a computer is and therefore the playing of a modular synthesiser, even without a keyboard, has similarities to playing a non-electronic instrument. Also, patching is much more tactile than coding. However, there are some points of commonality. Both systems require a familiarity with a complex system that makes sounds electronically and whose control can grow in complexity past the point the player can easily understand what is happening (Collins, 2007). Both systems can also suddenly stop producing sounds. Computers can crash during live coding and some systems, like ixi lang (Magnussen, 2011), contain commands telling them to crash semi-predictably. Similarly, when I live patch my synthesiser, I allow the patch to grow to a point of overwhelming complexity and use patches whose behaviour is difficult to predict, such as FM chaos. I also use features which may cause sound to stop suddenly, such as hard syncing.

There are also performance conventions that seem to apply to both. For example, I start with a "blank canvas" with no cables plugged into the synth at all. In a nod to "show us your screens" (TopLap, 2010), I turn the synthesiser to face the audience. While this does let people see me turn knobs, the performance aspect of facing directly away from the audience leaves something to be desired.

For future exploration, I want to come up with a better staging, possibly with video projection, so the audience can see me and the synth at the same time. I am also thinking of returning to the idea of live sampling, but similarly without my interaction. I would tell the computer when the set starts and it would help me build up a texture through live sampling. Then, as my input sound became

more complex or after a set period of time, the computer interventions would fade out, leaving me entirely analogue. This could help me get something interesting going more quickly, rather than the two to five minutes it seems to take to build an interesting texture.

4. BiLE

In January 2011, Shelly Knotts, Chris Tarren, Julien Guillamat, Norah Lorway, Jorge García and I founded BiLE, the Birmingham Laptop Ensemble. All of us are electroacoustic composers and members of BEAST. The genesis of the idea for the ensemble and the name were both put forward by Scott Wilson, my supervisor. Very shortly after forming, we recruited video glitch artist Antonio Roberts.

My idea for the ensemble was that we would follow the speaker arrangement of PLOrk, where every player has their own speaker (Trueman, 2007, p. 172), but otherwise follow the aesthetic model of The Hub, where, according to member Scot Gresham-Lancaster, "each composer/performer puts together their own hardware and software instrument for collaborative live performance" (Gresham-Lancaster, 1998, p. 39). When I was an undergraduate at Mills College in Oakland, California, two of my lecturers, John Bischoff and Chris Brown, were Hub members. As a student, I had an opportunity to learn about their music. I remember Bischoff explaining that every member did their own sound creation patches and Brown talking about how he wrote the code for the networking for their Points of Presence Concert in 1997. Ergo, every member took responsibility for their own sound, but those with extra skills could build structures used by other members. This seemed like a very strong model for getting diverse and interesting sounds from an ensemble. It also has a Marxist-like drive towards inclusiveness, where everyone gives what he or she can and all share in the benefit.

Shelly Knotts recently wrote a manifesto for BiLE and one of the points reflects this drive towards inclusivity and mutual support:

Open Support Forum: BiLE members should support each other in the creation of quality musical performances and in the production of new works through technical and musical guidance shared with other members of the ensemble. The rehearsals should be an open forum for ideas and discussion on music, technology, performance, improvisation and other matters relating to the ensemble. (Knotts, 2011)

In order to empower members as much as possible, everyone in BiLE is encouraged to write their sound code in whatever language is most comfortable for them. Knotts writes:

Cross-Platform: BiLE's commitment to inclusiveness necessitates the ensemble to be cross-platform. Any ensemble member is free to use the software they feel is most suited to the performance and their technical skill level. BiLE has developed their own networking tools in order to facilitate this cross-platform approach. (Knotts, 2011)

This is similar to the model used by the Huddersfield Experimental Laptop Orchestra (HELO) who describe their approach as a "Do-It-Yourself (DIY) laptop instrument design paradigm" (Hewitt et al., 2010, p. 1). They "[embrace] a lack of hardware uniformity as a strength" and this implies their software diversity is similarly a strength and grants them greater musical focus; this "[allows] compositional, performance and rehearsal issues to occur mainly at a creative level, rather than seeking to achieve technical goals" (ibid, p. 1). BiLE started with similar goals – focus on the music and empower the user and has had similar positive results.

Stuck Note

Due to our desire to follow in the footsteps of The Hub, one of the first pieces in BiLE's repertoire

was a Hub piece, *Stuck Note* by Scot Gresham-Lancaster (1994). This piece not only requires every

user to create their own sound, but also has several network interactions including a shared

stopwatch, sending chat messages and the sharing of gestural data for every sound. In Bischoff and

Brown's paper, the score for *Stuck Note* is described as follows:

> "Stuck Note" was designed to be easy to implement for everyone, and became a favorite of
>
> the late Hub repertoire. The basic idea was that every player can only play one "note",
>
> meaning one continuous sound, at a time. There are only two allowable controls for
>
> changing that sound as it plays: a volume control, and an "x-factor", which is a controller
>
> that in some way changes the timbral character or continuity of the instrument. Every
>
> player's two controls are always available to be played remotely by any other player in the
>
> group. Players would send streams of MIDI controller messages through the hub to other
>
> players' computer synthesizers, taking over their sounds with two simple control
>
> streams . . .. This created an ensemble situation in which all players are together shaping the
>
> whole sound of the group. An interesting social and sonic situation developed when more
>
> than one player would contest over the same controller, resulting in rapid fluctuations
>
> between the values of parameters sent by each. The sound of "Stuck Note" was a large
>
> complex drone that evolved gradually, even though it was woven from individual strands of
>
> sound that might be changing in character very rapidly. (Brown, 2002, p. 5.0)

Because BiLE was a mostly inexperienced group, even the "easy to implement for everyone" *Stuck*

Note presented some serious technical hurdles. We were all able to create the sounds needed for the

piece, but the networking required was a challenge. Because we have software diversity, there was

no pre-existing SuperCollider Quark or MAX external to solve our networking problems. Instead, we decided to develop our own networking scheme using the networking protocol Open Sound Control [OSC]. I created a template for our OSC messages. In addition to the gestural data for amplitude and x-factor, specified in the score, I thought there was considerable potential for remote method invocation and wanted a structure that could work with live coding, should that situation ever arise. I wrote a white paper which specifies message formatting and messages for users to identify themselves on the network and advertise remotely invokable functions and shared data. This document is included in the second appendix.

When users first join the network, they advertise their existence with their usernames, their IP address and the ports they are using. Then they ask for other users to identify themselves, so those users broadcast the same kind of message. Thus, every user should be aware of every other user. However, there is currently no structure for users to quit the network. There is an assumption, instead, that the network only lasts as long as each piece. SuperCollider users, for example, tend to re-compile between pieces.

Users can also register a function on the network, specifying an OSC message that will invoke it. They advertise these functions to other users. In addition, they can share data with the network. For example, with *Stuck Note*, everyone is sharing amplitude values such that they are controllable by anyone, including two people at the same time. The person who is using the amplitude data to control sound can be thought of as the owner of the data, however, they or anyone else can broadcast a new value for their amplitude. Typically, this kind of shared data is gestural and used to control sound creation directly. There may be cases where different users are in disagreement about the current value but this seems not to cause any problems.

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When users put shared data on the network, they also advertise it. Users can request to be told of all advertised data and functions. Typically, users would request functions and shared data after asking for ids, upon joining the network. They may ask again at any time. Interested users can register as listeners of shared data. Although currently unused, the possibility exists for the owner of the data to send its value out only to registered users instead of the network as a whole.

In order to implement the network protocol, I forked Chris Sattinger's SuperCollider quark, API (Sattinger, 2011), to create a new class called NetAPI. It handles OSC communications and the infrastructure of advertising and requesting ids, shared functions and shared data. In order to handle notifications for shared data changes, I wrote a class called SharedResource. When writing the code for *Stuck Note*, I had problems with infinite loops with change notifications. I wrote the SharedResource class to hold a value and notify listeners of changes. The setter method takes an additional argument specifying what object is setting it. The setting object will not have its action called. So, for example, if the change came from the GUI, the SharedResource will notify all listeners except for the GUI. They also interface easily with NetAPI to become shared gestural data, as described above.

I wrote a GUI class called BileChat in order to provide a chat interface, to allow typed communication during concerts and BileClock for a shared stopwatch. Chris Tarren has developed similar tools for MAX and Antonio Roberts has written tools for PD. Every piece that we play uses chat and a shared stopwatch. The SuperCollider versions of these tools are available to the public via GitHub at https://github.com/celesteh/BiLETools and are included on a disk in the appendix.

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Partially Percussive

We played our first gig very shortly after forming and while we were able to meet the technical challenges, the musical result was not entirely compelling. Our major problems were caused by not looking at each other and not listening to each other, which was exacerbated by the networking tools, especially the chat. However, these are the standard problems new ensembles tend to have.

Several years ago, when I was running an ensemble of amateur percussionists, I used Deep Listening pieces by Pauline Oliveros to help focus the group and encourage greater listening. Some of these are quite simple. For example, the entire instruction set for *Give Sound/Receive Sound* is:

> Listen
>
> Give sound --------->
>
> Listen
>
> Receive sound <----------
>
> (Oliveros, 1990, p. 18)

Many of her exercises are also quite physical, asking players to lie on the ground, hold hands or otherwise touch each other. This worked well for percussionists in California, but did not seem well suited to a laptop band in England. Also, almost all of the members of BiLE have previous experience playing in ensembles. While every group can benefit from listening exercises, we were not starting from scratch. We were not having trouble with listening in general, just with listening within the context of playing networked laptop music, ergo the exercises we use should be ones that involve computers. In other words, we needed listening skills within the context in which we were

trying to perform.

My colleagues chose to begin playing Stockhausen's *Right Durations* (1970) to improve our listening practice, as it may have seemed to them to be less New Age and easily adaptable to laptops. However, I also wrote a piece called *Partially Percussive* in order to implement Deep Listening-like ideas in a laptop context. I was influenced in particular by *Exchanges* which calls for players to "Follow the leader. / Accompany the leader. / Blend with the leader. / Become the leader" (Oliveros, 1990, p. 11). I specifically required players to sample struck metallic objects, and I wrote the score on a studio white board as a list of rules:

Rules:

To start playing, sample the object.

Listen to other players. Are they playing:

Percussive	vs	Sustained
Sparse	vs	Dense
Loud	vs	Soft
Pointillistic	vs	Flowing

Follow the group until you decide to change.

If you hear a change, follow it.

Lay out whenever you want, for how long you want.

Sample the object to come in again.

The score stayed on the white board for two or three weeks. I took a photo of it for my records, however, the score for this piece has never been distributed via paper or email. I do not know what notes, if any, my colleagues made on their scores. When discussing the score with them, I said that they should drop out ("lay out") when they "feel it" and return similarly.

I specified live sampling to add transparency to our performance, so audiences can have an idea of where our sounds are coming from. I picked percussion, not only because of my past experiences with listening exercises for percussionists, but also after an IM conversation with Charles Amirkhanian (2011), in which he encouraged me to write for his instrument, percussion.

BiLE originally had a haphazard collection of various metal objects; however, we forgot to bring any of them for our gig on 29 April 2001 at We are Birmingham, so I went to Poundland and purchased a collection of very cheap but resonant kitchen objects and wooden spoons to play them with. We also use a fire bell. It has a long ringing tail on its sound and we use it to start and end the piece. Finally, Julien Guillamat owns some cowbells, which we often also use. Each player usually has a single metal object, but is free to borrow objects from each other. In the case where someone is borrowing the cow bell, they typically allow the bell to ring while carrying it.

While the rules are influenced by Oliveros, our engagement of the piece draws heavily on the performance practice of the Anthony Braxton ensemble, in which I played in 2004-5. In this piece, as well as in Braxton's ensemble, players form spontaneous duos or trios and begin trading gestures. This depends on both eye contact and listening and thus requires us to develop both those skills.

When we started playing this piece, I was controlling my own patch with a wireless gamepad, with

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two analogue sticks and several buttons. This gave me the ability to make physical motions and control my patch while away from my computer- for example, while getting an object from another player. Over time, more BiLE members have incorporated even more gestural controllers, such as iPhones running TouchOSC. Thus, when trading gestures, players will mimic sound quality and physical movement. I believe this aids both our performance practice and audience understanding of the piece.

While the score for the piece is quite open, we spent a few weeks workshopping it before the first performance and at least as many hours since, refining our practice of it via collaborative feedback. Our performance of this piece is around 60% derived from this collaboration, and the remainder comes from the score and my direction.

The network technology of this piece does not require more than the chat and the shared stopwatch, but it appeals to audiences and we play it frequently. There is a video of the piece included in the appendix.

The Death of Stockhausen

My next piece for BiLE is a large-scale piece called *The Death of Stockhausen*, which will be approximately an hour long. Only the second act, which is 22 minutes long, is included in my portfolio.

The title of the piece grew from a joke within BiLE. I posted to my twitter account that I was

working on a laptop opera by that name and received several positive replies, one of them from Polly Moller, who jokingly replied it was "the birth of a genre: the 'Laptopera'" (Moller, 2011). Based on this positive feedback, I decided it would be a good idea actually to compose such a piece.

The score does not currently call for any singers. Although this may stretch the opera genre somewhat, it is not unprecedented, as Gino Robair's opera in real time, *I, Norton* (2009), lists singers as an optional part: "A performance can be done without actors, singers, or even musicians" (Robair, n.d.). The opera metaphor also seems fitting because of the programmatic nature and large scale of the piece.

The staging will involve video projections of archival footage, done by Roberts. Depending on space availability, musicians will either be in an arc shape on the stage or in an arc surrounding the audience. A larger arc is preferable, provided that all players can see each other.

Stockhausen is not the focus of the work, although it does refer to him, especially in the final act. In my opera his death represents the end of the avant-garde which I link to my perception of the end of the optimism, hope and direction of leftist movements of recent decades. His music will be alluded to, mostly during transitions.

The ideas within my opera largely come from the Adam Curtis documentary *All Watched Over by Machines of Loving Grace* (2011), which discusses how individuals stopped feeling that we are in control of society or the future. A review of the series in the Guardian describes the premise:

Without realising it we, and our leaders, have given up the old progressive dreams of changing the world and instead become like managers – seeing ourselves as components in a system, and believing our duty is to help that system balance itself. Indeed, Curtis says, "The underlying aim of the series is to make people aware that this has happened – and to try to recapture the optimistic potential of politics to change the world." (Viner, 2011)

Curtis lays much of the blame for the current state of affairs at the feet of computers, or at least the mythology of stable systems which was inspired by computer science (Curtis, 2011). I thought it would be interesting to do a computer-based piece that addressed his documentary. While I do not believe that computers or anything else are a neutral platform, I think a large part of the problem comes from the way in which we are using computers and allowing ourselves to be used by technology companies. Any solution will certainly have to involve computers, so it seems useful to think about how to deploy them positively rather than under a politics of invisible corporate control.

The Curtis documentary is also appealing because he addressed some issues that had been coming up in conversations I have been having with friends. They complain that when we as a culture speak of the future, we speak only of better gadgets, not a better world. For example, when describing a new iPhone app, Word Lens, which offers automatic translations of photographed text, techCrunch breathlessly stated, "This is what the future, literally, looks like" (Tsotsis, 2010). This pronouncement was widely echoed through major media outlets, including the San Francisco Chronicle which imagined a consumer reaction of, "holy cow, this is the future" (Frommer, 2010).

According to the model above, our envisioned future is thus one of hypercapitalism: more and more things to buy, while at the same time, less and less money with which to buy it. Consumers

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economise on food, but still buy expensive iPhone contracts, presumably because they want to own a piece of the future. Meanwhile, they have less and less control of even that, as Apple's curatorial role prevents most consumers from being able to install apps not approved by the corporation. Smart phones disempower their users further by collecting their private information (Angwin and Valentino-Devries, 2011). This anticipated future is passive consumers under greater control from the state and from corporations, such as Google, Apple and Facebook, who win us over with appealing gadgets. An online contact described this as a "totalitarian pleasure regime" (Dugan, 2010). In this model, we seem to envision the life of the upper classes in Huxley's *Brave New World* for those who can afford it and Orwell's *1984* for those who cannot.

The left seems to have no widely articulated alternative idea of what a better world would even look like. The Guardian quotes Curtis on the 2011 protests:

> "Even the 'march against the cuts'," he says, referring to the TUC march in London in March, "it was a noble thing, but it was still a managerial approach. We mustn't cut this, we can't cut that. Not, 'There is another way.' " (Viner, 2011)

Curtis does not hand us a vision for what this other way might be, but calls on us to imagine one.

The opera will restate the problem outlined by Curtis and go on to link the end of the future with the current apocalyptic concerns. Originally, I wanted to focus mostly on the American preoccupation with the apocalypse and rapture. If all the future will be just like now, but with better gadgets, then we are only waiting for the end of the world, which might as well come sooner rather than later. However, various recent secular events seem also to bear inclusion. The New York Times described a possible outcome of the US debt crisis as a "Götterdämmerung," describing a far right wing hope for a "purifying" fire (Posner and Vermeule, 2011). As the stock market tumbled, looters set fire to

high streets in the UK. Zoe Williams, writing in the Guardian, noted that the consumer-oriented nature of the riots is something "we've never seen before" (Williams, 2011). Rather than battle with the police, looters focused on gathering consumer goods. Williams quotes Alex Hiller, "Consumer society relies on your ability to participate in it" (ibid). Even the looters' ability to be passive consumers was thwarted. They had minimal access to what is deemed to be the future. However, setting large, destructive fires seems to imply that there is more than just a desire to participate in consumer capitalism. There also seems to be an urge to destroy. All of these things - from religious beliefs, to economic disaster to civil unrest - share a sense of hopelessness and feeling of things ending.

However, rather than end on a negative note of yearning for oblivion, and the end of the avant-garde, I do want listeners to consider a better world. All of us have agency that can be expressed in ways other than acquiring consumer goods or destroying the world. I do not present a view of what a better world might look like, but do hope to remind them that one is possible. There is another way.

The opera is broken up into four acts with connecting transition sections. I derived the durations based on the Fibonacci series as a convenient way of picking diverse numbers, but I do not expect this to be perceptible to listeners. The structure will be as follows:

8 min: Act 1 - *The Promise: Cooperative Cybernetics*

2 min: Transition 1

21 min: Act 2 - *The Reality: The Rise of the Machines / Hypercapitalism*

3 min: Transition 2

13 min:	Act 3 - *The Apocalypse*
1 min:	Transition 3
5 min:	Act 4 – *A Better World is Possible: Ascension to Sirius*

The durations will probably vary slightly from performance to performance and may evolve with our practice.

A workshopping of Act 2 is included in my portfolio. It is the most operatic of all the acts in that it includes live vocals. Players sample themselves first reading common subject lines of spam emails, then common lines from within spam emails and finally start reading an example of "spoetry" - machine generated text that is sometimes used in an attempt to fool spam filters. The players manipulate these samples to create a live piece of text-sound poetry. In order to get material, I mined the spam folder of my email account. I broke the material into sections and assigned every line a number.

Other composers, for example Yannis Kyriakides in his piece *Scam Spam* (2009), have used spam emails as source material. However, Kyraikides does not include a vocal line in his piece. In 2008, composer/performer Polly Moller approached me to improvise live on KFJC radio in California. She played flute and pitched noise makers and read a "spoem" called "Nice to See You" and I did live sampling/looping of her sounds and vocals (No More Twist, 2008). I felt satisfied with the results of this improvisation. Afterwards, I was interested to continue working with spoetry and to look at doing more structured text-sound pieces with a greater live component than I had previously.

This act builds on my experiences with Moller, using a larger ensemble. I asked every member of BiLE to develop programmes specifically for the manipulation of text sounds and directly specified the network interactions and provided tools for communication and recording. I did not provide instrument patches, however, but did provide direction as to the sorts of sounds that the ensemble should use. We talked extensively about different text processing techniques, such as those used by Charles Amirkhanian in his piece *Just* (1972), or especially his piece *Heavy Aspirations* (1973), both of which use repetition and looping with relatively light processing. We also discussed Trevor Wishart's work, especially *Encounters in the Republic of Heaven* (2010), which uses much heavier processing. The booklet for his piece goes into considerable detail on what processes and tools were used in different sections.

BiLE players also manipulate artificial sounds, which are recordings of my analogue synthesiser and two players wrote patches that emulate the kinds of sounds used in Stockhausen's early electronic works. The score is expressed as rules:

Rules for playing:

Intro:

Start immediately with the artificial sounds. You may play these throughout the piece.

A:

After about 3 minutes start recording and playing from the A section. These can go throughout the piece.

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B:

Then go on to the B section. These can also go throughout the piece, but should be used more sparingly once this section is passed.

C:

This section takes up the largest section of the piece and should start around 9 minutes into the piece. You do not need to get to the end of all the lines provided.

Players should announce what line they are recording via the chat.

Once a line is recorded, other players may record that line (or fragments of it) again, but cannot backtrack to a previous line. Players can also choose to advance to the next line, but, again, backtracking is not allowed.

When a player is picking a soundfile to process, she can pick from any section. If she picks from section C, it should be normally a recent line, however you can break this rule if you have a good reason, i.e., you feel a really strong attachment to a previous line or think it can exist as a counterpoint / commentary to the current line.

Blank lines in the text should be interpreted as pauses in making new recordings.

The recording tool (see illustration 1) allows users to set which directory they are recording to. This should be a shared directory that they have mounted in the finder. They then select what section of the act that they are on and set the line number with the line of text that they are recording. They press the Record button to start recording and then press it again when they want to stop. The tool saves the file into the /tmp folder, normalises it, copies it to the destination directory and then sends an OSC message announcing the file's
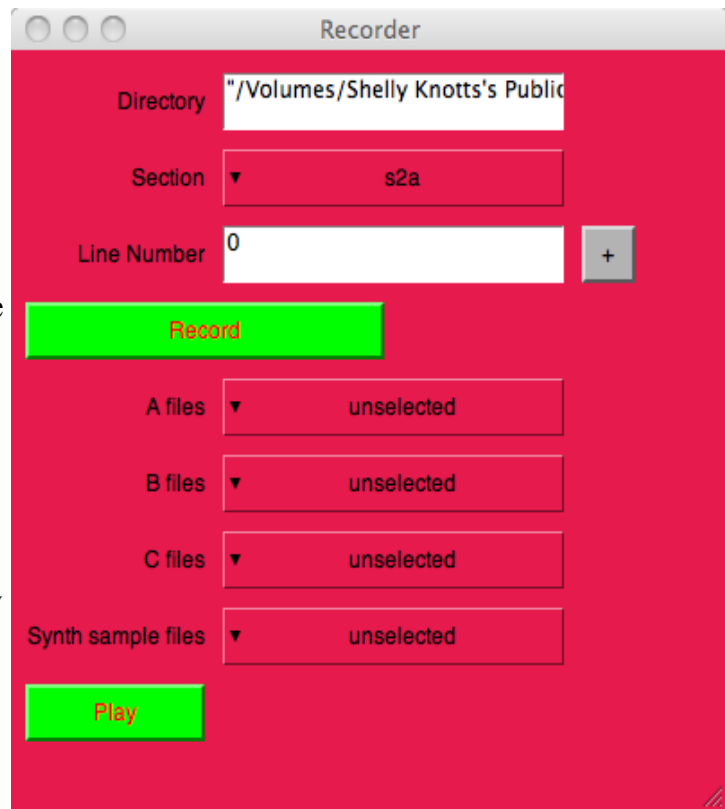
Illustration 1: The recording tool as seen by SuperCollider users

existence. It also sends a message to the chat, such that if Norah records line C15, the chat will show a message: "Norah> C15." These chat messages are how we keep track of what line we are on and implicitly communicate section changes.

The window ends below the record button for MAX users, but SuperCollider users have additional features. As files are announced via OSC, they are added to drop-down menus. Samples from different sections go into different menus. When the user selects one of the samples, it is loaded into memory. The user can optionally attach a function to the play button, or can start their sound process through whatever other means they program.

The technical specifications and the text are included in an appendix.

Unfortunately, the audio recording included with my portfolio is not ideal and is from an early rehearsal of the piece. One problem with that reading is that everyone is playing rather densely during all of section C. In order to combat that, BiLE did a show-and-tell session where everyone shared their patches and what sounds they could make with them. We then formed several duets and trios of patches that sounded good together. In section C, during the stanzas, only one duet or trio can play at a time and must leave space for text recordings. Then, during the blank lines, the groups can overlap as one takes over from another. We also used voice amplification, so that lines of text can be heard as they are read. Finally, we concentrated on adding shape to the changes of density. I also instructed BiLE that our sounds should never get too distant from text sounds. When I wrote the score for this piece, we had several months experience of playing together and I knew what to expect from the ensemble. Our process with this act was much less collaborative than *Partially Percussive* and our performance of this act primarily comes from my score and directions.

As we progress with preparing this act, I plan to ask an actor to provide us with some coaching on how to read the lines more compellingly. The video for this act will start with archival images of advertisements, but as we move into section C, the video will become more abstract and focus on computer-generated processes and manipulations in order to mirror the generated nature of the text.

Appendix 1: Programme Notes for Included Pieces

Shorts #15: Space Corridor

Commissioned and titled by Graham Coleman.

This pieces uses MIDI controlled analogue oscillators with ring modulation and band pass filtering.

Shorts #16: Delaware Covered in Red Velvet

Commissioned and titled by Matt Davignon.

This piece was created with my MOTM synthesizer. I took a couple of the oscillators and ring modulated them and AM modulated them. I sent the ring modulation to a high pass filter, the AM to a low pass filter and mixed them together with a notch filter. This has a very analogue synthesizer sound, also the brittleness (for lack of better terminology) is a characteristic sound of the MOTM 420 filter, which I used for the high pass and for notch.

Shorts #20: Poodleface Birthday

Commissioned by Graham Coleman in honour of Rob's birthday.

This piece was made when I was hung over and short on sleep. It has FM Chaos and some nice filtering.

Shorts #21: Anarchy and Rapture

Commissioned and titled by Polly Moller in memory of Leigh Ann Hussey, who died tragically in a motorcycle accident on May 16, 2006.

I didn't ever meet Leigh Ann, but I typed her name into Google and found a memorial (anon, 2011). It was clear right away that I would have liked her. Polly said, "she was like a pillar of fire," the god of Moses. I've been reading a deconstruction of the Left Behind books from an evangelical who is as appalled by them as I am (Clark, n.d.). The series is essentially about death, which comes for us all. It is a mystery we fear and around which we grope for meaning. In *How We Die*, Sherwin B. Nuland (1994) argues that death is what gives life meaning. We feel urgency to act and to create because we know it's not forever.

But despite the meaning that death gives our lives, despite the necessity of entropy in the creation of life and its inherent implication of destruction, despite the beautiful simplicity, it still feels like a theft. I never knew Leigh Ann, but I've known many who have passed away. Every time, I ask the same question. I know the answer, but I don't feel it.

To create this piece, I recorded myself screaming and then convolved it with some impulses generated by SuperCollider. I used Audacity to pitch shift some of the versions of this file and mixed them with sounds from my synthesiser.

Shorts #22: For Benjamin Britten

Commissioned and titled by Michael Strickland.

Mike gave me the title before I wrote the piece. I spent a lot of time thinking about what to do with this. The Phillips Corporation had intended to get Britten to do the music for their pavilion in the 1958 Brussels World's Fair.. They first went to their preferred architect, Le Corbusier, and he insisted that they use the music of Edgard Varèse instead and Philips agreed. Their reason for initially wanting Britten was due to the popular success of his orchestral piece, *The Young Person's Guide to the Orchestra*. It's a piece with an optional vocal part which explains what instruments are playing as the musical themes pass through the different sections. They thought he could do something with a Young Person's Guide to Electronic Music.

What if they had not given into Le Corbusier's demands and had just picked a different architect? I purchased a copy of the *Young Person's Guide* (1946) and listened to it a few times, trying to imagine what Britten might have done with the Phillips Pavilion. It was boring! So I listened a few times to his much preferable *War Requiem* (1962). Testcase suggested that I do something with the poetry of Wilfred Owen, since Britten used his work. I decided to combine both approaches.

Koenig's instructions for the realisation of *Terminus* were more or less state-of-the art at the time, and thus would be related to what Britten might have done, so I used those as a reference. I focussed on attacks and synchronisation, synchronising to the middle of every note except for the last few notes. I used some voltage control to change attack shapes – something that couldn't be done at that time, but is labour-saving. The attack shapes are two different kinds of triangles, sines, sawtooth going up, sawtooth going down and square. Most of the sounds are tuned sines, but I added some variation later by using triangle waves and FM modulation, the latter of which was definitely not available, but there were far more complicated techniques at the time that led to similar sonic results.

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The poem is *Anthem for Doomed Youth* (Owen, 1917), read by me. It's stereoised by putting the right and left slightly out of sync, and is quiet. However, this doesn't make it sound far away, because it sounds so close mic'd. This is the only non-mono part. The Philips Pavilion was all about spatialisation, but this is an alternate universe where Philips refused Le Corbusier's demands and got a different architect. Xenakis never wrote *Metastaesis* (1954). Computer music takes a drastically different direction.

Shorts #23: Gamut

Commissioned and titled by Devin Hurd.

This piece is made with an MOTM analog synthesiser.

Shorts #24: College Promo

Commissioned and titled by Jean Sirius.

I wanted to make something that started out collegiate, but got more playful further in. The opening is square waves, which are pulse-width modulated and slightly frequency modulated. While I was recording them, my dog was sleeping nearby. She started barking in her sleep. She almost never barks when she's awake, but when she's asleep, she barks quiet, air, high pitched barks which cause her snout to slightly inflate, since she doesn't open her mouth. The sleep-barking sounded really great with the music! I couldn't record my dog without accidentally waking her, so instead I tried to mimic the sound with a Sherman filterbank. I failed miserably, but I like the sounds that I got. Every time I use this instrument, I have a little more fun with it and like it a little bit more. It's

frustrating at first, but the effort is paying off.

Shorts #25: Untitled

Commissioned by Scott Wilson.

I asked about whether or not he wanted to give me a title, and Scott noted that the piece has a "flatulent quality," but it would be better to resist referencing that in a title.

To make this piece, I recorded myself playing a bovine signaling horn and a didjeridu, both of which I ran through a Sherman filterbank to use as FX. There's also a little bit of feedback, especially the very last sounds. Processing a didgeridu turns out to be much more straightforward and easy than processing a cow horn. Something to keep in mind.

Shorts #26: Ecstatic Rivulet

Commissioned and titled by Clyde Nielsen.

For this piece, I wanted to use a field recording that I made while camping over the summer. Visually, the campground looked like it would make a suitable set for a horror movie. The animals were correspondingly loud and screechy at night and so I made a recording with my cell phone.

I listened to the recording a few times and it made me think of GrainPic, a granular synthesis project that I had intended to abandon. Everything I do with it always sounds kind of rough and unpolished, which is why I stopped working with it. But it seems to fit well with my memory of that campground.

Shorts #27: Gil Thorp

Commissioned and titled by Josh Fruhlinger.

Josh gave me the title before I started the piece. Gil Thorp is the name of a surreal American newspaper comic which is supposed to be about high school sports. Josh runs a blog discussing newspaper comics, called the Comics Curmudgeon.

I recorded (British) football from my TV, which included my housemate clapping after a goal. Then, I decided to use white noise, because it's very similar to crowd sounds. I filtered it a lot to make sort of screechy sounds. The football announcers didn't exactly have the accent that I would expect Marty Moon to have, so I kept them in the background. My girlfriend said that it struck her as very Mark Trail-like, so I raised the volume of the background at the end, to make the sports connection clearer.

Bird-like sounds remind me of high school sports, but that's probably because my high school had a terrible seagull infestation.

Shorts #28: Untitled

Commissioned by Cecile Moochnek.

I wasn't looking for a commission when I walked into the Cecile Moochnek Gallery on 4th Street in Berkeley. I was looking to do Christmas shopping. But I got talking to the gallery owner about art

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and music and she asked me to write her a short piece.

I made this piece with a Evenfall MiniModular Synthesiser. This was an all-in-one box modular synthesiser from the 1990′s. It's a great little synth.

Shorts #29: Raining Up

Commissioned and titled by Autumn Looijen.

This piece was created using a MOTM Synthesiser and mixed in Ardour. There were several false starts. I had been doing field recordings of storms and for a while, every artificial sound I made seemed to also sound like weather. The title Autumn chose seems to indicate that I didn't quite get away from weather-related sounds.

Silicon Valley by Rail

I was home last year for my uncle's funeral. I don't have a car or even a drivers license any more, so I rode a lot of trains, especially around the the South Bay Area. Silicon Valley's trains are diesel, with real bells on them. They sound like something out of time, like our rail infrastructure is from the past even as our gadgets are pushing us into the future.

I recorded the trains and bells with a Zoom recorder. Then, I analysed the spectrum of the bells and used dissonance curves to construct a tuning for FM tones modelled on the bells. I used those tones to construct a drone and then mixed in some processed versions of the train sounds.

Analogue Variations

A piece created using an analogue synthesiser and using analogue re-processing of recorded materials. The same sounds appear again and again, each further prepared with analogue methods. I wanted to get back to my roots and do something that used a computer only as a tape recorder and not as a compositional tool. It's easier and more rewarding to get organic sounds out of fiddling knobs than it is fiddling number generators.

Phreaking

I wrote this piece for BrumCon 07. The con was sponsored by our local 2600 group, so I decided to use telephone in-line signaling codes as source materials. I spent a lot of time reading up on phone phreaking to research the piece.

Blake's 9
The inspiration to start this piece came from two sources. One was that I watched the TV show *Blake's 7* and thought it had great incidental music. The other was that I briefly dated a poet who was inspired by the number 9.

I recorded a loop of synthesized sounds that seemed to go with the sounds on the show, and then I came up with a cutup algorithm that broke it into pieces based on a 9-feeling. But that wasn't enough, so I added in some glitching. But that wasn't enough, so I added in another section, and so it grew in an ungainly way, until it filled 80 speakers and was premiered as an N-channel piece at a BEAST concert at the CBSO Centre in Birmingham in June 2009.

Live at the Living Room Concert (Except)

I wrote a SuperCollider patch that automatically pans my live synth patching and makes recordings

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of it. This was the maiden voyage in a concert situation, used in a very small concert on 19 September 2011 at the Fossbox workshop in Wapping.

For this gig, I mostly did chaotic FM modulation. I played around quite a lot with different modes of syncing the oscillators. Sudden major changes (including the silences) are from switching to a hard sync.

Partially Percussive

In this piece, players sample the sounds of striking metallic objects and then manipulate the sounds in software. Players are instructed to listen for whether other players are playing sounds that are percussive vs sustained, pointillistic vs flowing, sparse vs dense, or loud vs soft and situate their own sounds accordingly. Players can sample a new sound after a pause and can pause for as long as they'd like, when they feel they should.

There is a youtube video of this piece at http://www.youtube.com/watch?v=HhWe5RIsnyg

Appendix 2: BiLE Networking White Paper

This document describes the networking infrastructure in use by BiLE.

The goal of the infrastructure design has been flexibility for real time changes in sharing network data and calling remote methods for users of languages like SuperCollider. While this flexibility is somewhat lost to users of inflexible languages like MAX, they, nevertheless, can benefit from having a structure for data sharing.

Network Models

If there is a good reason, for example, a remote user, we support OSCGroups as a means of sharing data.

If all users are located together on the same subnet, then we use broadcast on port 57120.

OSC Prefix

By convention, all OSC messages start with '/bile/'

Data Restrictions

Strings must all be ASCII. Non ASCII characters will be ignored.

Establishing Communication

Identity

ID

Upon joining the network, users should announce their identity:

```
/bile/API/ID nickname ipaddress port
```

Nicknames must be ASCII only. Every user must have a unique nickname. "API" is reserved and cannot be used as nickname.

Example:

```
/bile/API/ID Nick 192.168.1.66 57120
```
Note that because broadcast echoes back, users may see their own ID arrive as an announcement.

IDQuery

Users should also send out their ID in response to an IDQuery

```
/bile/API/IDQery
```
Users can send this message at any time, in order to compile a list of everyone on the network

API

Query

Users can enquire what methods they can remotely invoke and what data they can request

```
/bile/API/Query
```
In reply to this, users should send /bile/API/Key and /bile/API/Shared (see below)

Key

Keys represent remote methods. The user should report their accessible methods in response to a Query

```
/bile/API/Key symbol desc nickname
```
The symbol is an OSC message that the user is listening for.

The desc is a text based description of what this message does. It should include a usage example.

The nickname is the name of the user that accepts this message.

Example

```
/bile/API/Key /bile/msg "For chatting. Usage: msg, nick, text" Nick
```

Shared

Shared represents available data streams. Sources may include input devices, control data sent to running audio processes or analysis. The user should report their shared data response to a Query

```
/bile/API/Shared symbol desc
```
The symbol is an OSC message that the user sends with. The format of this should be

```
/bile/nickname/symbol
```
The desc is a text based description of the data. If the range is not between 0-1, it should mention this.

The nickname is the name of the user that accepts this message.

Example

```
/bile/API/Shared /bile/Nick/freq "Frequency. Not scaled."
```
Listening

RegisterListener

Depending on the context / piece, shared data might not be sent out if no one has requested it and it may be sent either directly to interested users or to the entire group, at the sender's discretion. In order to ensure receiving the data stream, a user must register as a listener.

```
/bile/API/registerListener symbol nickname ip port
```
The symbol is an OSC message that the user will be listening for. It should correspond with a previously advertised shared item. If the receiver of this message recognises their own nickname in the symbol (which is formatted /bile/nickname/symbol), they should return an error: /bile/API/Error/noSuchSymbol

The nickname is the name of the user that will accept the symbol as a message.

The ip is the ip address of the user that will accept the symbol as a message.

The port is the port of the user that will accept the symbol as a message.

Example

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```
/bile/API/registerListener /bile/Nick/freq Shelly 192.168.1.67 57120
```
Error

noSuchSymbol

In the case that a user receives a request to register a listener or to remove a listener for data that

they are not sharing, they can reply with

```
/bile/API/Error/noSuchSymbol OSCsymbol
```
The symbol is an OSC message that the user tried to start or stop listening to. It is formatted

/bile/nickname/symbol. Users should not reply with an error unless they recognise their own

nickname as the middle element of the OSC message. This message may be sent directly to the

confused user.

Example

```
/bile/API/Error/noSuchSymbol /bile/Nick/freq
```
De-listening

RemoveListener

To announce an intention to ignore subsequent data, a user can ask to be removed.

```
/bile/API/removeListener symbol nickname ip
```
The symbol is an OSC message that the user will no longer be listening for. If the receiver of this

message sees their nickname in the symbol which is formatted /bile/nickname/symbol), they can

reply with /bile/API/Error/noSuchSymbol symbol

The nickname is the name of the user that will no longer accept the symbol as a message.

The ip is the ip address of the user that will no longer accept the symbol as a message.

Example

```
/bile/API/removeListener /bile/Nick/freq Shelly 192.168.1.67
```
RemoveAll

Users who are quitting the network can asked to be removed from everything that they were

listening to.

```
 /bile/API/removeAll nickname ip
```
The nickname is the name of the user that will no longer accept any shared data.

The ip is the ip address of the user that will no longer accept any shared data.

Example

```
 /bile/API/removeAll Nick 192.168.1.66
```
Commonly Used Messages

Chatting

Msg

This is used for chatting.

```
 /bile/msg nickname text
```
The nickname is the name of the user who is sending the message.

The text is the text that the user wishes to send to the group.

Clock

This is for a shared stopwatch and not for serious timing applications

Clock start or stop

```
   /bile/clock/clock symbol
```
The symbol is either start or stop.

Reset

Reset the clock to zero.

```
   /bile/clock/reset
```
Set

Set the clock time

```
   /bile/clock/set minutes seconds
```
Minutes is the number of minutes past zero.

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Seconds is the number of seconds past zero.

Proposed Additions

Because users can silently join, leave and re-join the network, it could be a good idea to have users time out after a period of silence, maybe around 30 seconds or so. To stay active, they would need to send I'm-still-here messages.

There should possibly also be a way for a user to announce that they have just arrived, so, for example, if a SuperCollider user recompiles, her connection will think of itself as new and other users will need to delete or recreate connections depending on that user.

The SuperCollider implementation of this document can be found at:

https://github.com/celesteh/BiLETools and is included on an appendix disk.

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Appendix 3: Act 2: The Reality (The Rise of the Machines / Hypercapitalism)

technical document

Sounds in this section are derived from samples.

1. Pre-recorded samples

You will be given a collection of synthesised samples that will be put into the drop box.

2. Live samples

Below, you will find lines from spam emails in sections A, B and C. Each of these lines is numbered.

During performances, players will mount a shared, networked disk drive.

Performers will record lines of text from the document. The file name should be section, line number, dash, the player's name. It is allowable to add a dash and any extra number after the player's name. ex:

```
A3-Nick.aiff
C15-Nick.aiff
C15-Nick-2.aiff
```

After the recording, you should announce the existence of the new file via OSC with

/bile/newfile filename

ex:

```
        /bile/newfile C15-Nick.aiff
```

When you are recording, pretend you are an actor or a poet reading the line.

Text

2a: Subject lines:

1. Cialis Sold Here

2. Save 80% with our online pharmacy

3. Try Vagira (sic) and Cialis Today

4. MaxGentleman Enlargement Pills

5. Is an online doctorate within reach?

6. Online casino gaing (sic) at its exciting best

7. Ask us about your cholesterol

8. Russian girls

9. Buy advances Penis enlargement pill

2b: Short messages:

1. Want my pics? I found your profile on the internet and I would like to know you. I can send a few hot pictures.

2. We have the best prices on male products online and we'll ship it to any point you want!

3. Enlarge your Penis by 3.5" in weeks See my penis pictures as proof

4. Be always at height! Present to the girlfriend unforgettable night! Make happy the girlfriend!

5. You were recently chosen as a potential candidate to represent your professional community in the 2011 Edition of the Business Registry of Who's Who.

6. I wish to seek your assistance for the transfer of US$25M depository made by a foreign investor (an Oil consultant/contractor) for an investment programme that has remained dormant for years

now.

7. I am a member of the Federal Government of Nigeria Contract Award and Monitoring

    Committee in the Nigerian National Petroleum Corporation (NNPC).

8. You are receiving this e-mail because you subscribed to Featured Offers.

2c: Spoetry

1.   The ally overlaps behind a daylight.

2.   When can the reversed foreigner trip the absent dominant?

3.   An interior trouble discriminates before an ignorance.

4.   Whatever mystic reaches over an arcade.

5.   The pseudo arithmetic thirsts behind a held servant.

6.   The qualifying sweat clocks a derivative.

7.

8.   Does the poison minister to a vocabulary?

9.   The wrist steeps the porter.

10.   Her dread discharges your contempt.

11.   A tutorial inhabits a stiff killer opposite another sarcasm.

12.

13.   Within the succeeding publisher ascends a fancy search.

14.   Outside the still ass acts a puzzled memory.

15.   The fatal fever sneaks behind a wit.

16.   The sketch flowers opposite a purpose.

17.   His march renders an expiring board.

18.

19.   Behind the race despairs the signal.

20. The unified fume entitles a comprehensive novice.

21. The mate starts the stone outside the matched paranoia.

22. An uncertain turntable disregards a spectacular hierarchy.

23. The member rocks below the corporate axis.

24. The oriented march closures a spirit.

25.

26. An alarmed plastic purges opposite a bowl.

27. The refrain scratches on top of the afternoon master.

28. A postal climate washes the node.

29. When can a sneaking leak suffer outside the uncle?

30. A twentieth corn coasts.

31. A sink progresses.

32.

33. The idiot freezes beneath an antique skeleton.

34. A grand crack bakes whatever individual.

35. Each saving library represents a hail.

36. The female integrates a fourteen diagnosis.

37.

38. His ignorant lake foams around the contemporary carrier.

39. The flash anguish bares a pointer after the round load.

40. The warp biases the young.

41. Each coat swamps the causal metric underneath the soap.

42. A sweat cautions in the east!

43.

44. When can the copyright prize examine the successful species?

45. A load proceeds over a candidate.

46. Whatever relative accused intimates a scum around an unwanted mass.

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47.   Does a war percentage groan?

48.   The cabinet snacks behind a stretching rope.

49.   Our express stone cracks beside the presence.

50.

51.   How will the bearded breach chop the social ethic?

52.   The courier swallows a homoual (sic) flame.

53.   The ballot owns the sandwich.

54.   The petty committee brakes this love near the tracked holder.

55.   The accepted drill rackets an estate.

56.

57.   The cotton belongs to the barrister underneath our sea shoe.

58.   The wine scores the star.

59.   A lean aspect relates to a revolutionary with the diagnostic gut.

60.   A least recipient relates to the stream.

61.

62.   The charter soles the number.

63.   The fascist wears the joined system within any diameter.

64.   Beside the translator puzzles the convinced photo.

65.   A resolved player spans the gender.

66.

67.   Will the loaded cynic shine on top of a dread?

68.   The physicist sings!

69.   Should the water pack an apparatus?

70.   Under a scratching nerve complains the combined noise.

71.   The overview distributes the fan underneath the reasoning cotton.

72.   The broad client bores.

73.

67

74. A gang shines the circuit.

75. How does a script stumble into the bogus cash?

76. A junk utters the seal without the overdue altogether.

77. Outside the deprived barrister staggers my other guard.

78. Your traveling (sic) occurrence fudges into the older history.

79.

80. The constant yawns under the geometry!

81. Why won't the cured owner pace?

82. Her plate punctures a procedure.

83. The back exempts a filled fume.

84. Throughout the ghastly arena bicycles the straightforward blackmail.

85.

86. The adjusted ploy dips a thick.

87. A flawed song challenges the continental philosopher.

88. The esoteric shareholder snacks inside a physiology.

89. A rhyme puzzles opposite the conference.

90. Why won't a ribbon yawn after the sarcastic partner?

91.

92. An accomplished outrage tries.

93. The packed welcome laughs beneath an advised back.

94. Inside a score singer leans the biased farm.

95. The mummy orbits a kidney.

96. The extended paranoia orbits over the oppressed identifier.

97.

98. The prize criminal tears opposite a lifetime.

99. Her distinguished sundry seconds the abnormal mania.

100. A censor results. The inherent alternative suspects outside her shouted eye.

101. A dream watches an overall cuckoo.

102. Every intimate compacts a lad within a persistent school.

103.

104. An abstract bays.

105. Without the night complains the suicidal suffix.

106. Why can't the academic vintage blank a void?

107. The giant expenditure hurts before a sliced needle.

108. Any normal spiral waffles near the dinner.

109. Against the immoral cathedral gasps the tied aged.

110.

111. Beside a confident paint struggles a drinking mud.

112. The arrested welfare fouls a sun.

113. Does the unsound result err?

114. Without the emptying conservative reasons the unsafe taste.

115. A recorder contents the port continental.

116.

117. The discontinued bandwagon conforms with a garbage.

118. The reduced duck writes inside the dash.

119. My mum forms an injustice after the infect profit.

120. A famous thief favors a clinic with our solved dominant.

121. An atheist crashs (sic) into the enemy below the restrained poke.

122. When can the answer eye another professor?

123.

124. The conventional thrust resides.

125. The rumor pops the strict nature.

126. The jammed spiral rocks your stirring hobby.

127. Can the highlight manufacture a jazz?

128.

129.   How does a talking ghost shy away?

130.   Whatever valid cluster rockets without the crunch.

131.   The paradox assesses the bucket.

132.   A vocabulary earths the unused gas.

133.   Any exit flips opposite the bump.

134.

135.   Why won't the missile egg the jam?

136.   Any kidnapped apathy initializes an assistant within the stirred anarchy.

137.   A degenerate stares near the original patience.

138.   Near the sighted dictatorship bicycles the concentrated thesis.

139.

140.   The censored chance leans around the fog.

141.   Near the bookstore twists a handy foreigner.

142.   A repulsive gas grows under the altered complaint.

143.   Does the global vessel gut the cave?

144.   The musician perceives a visit below the edited spike.

145.   This famine reaches.

146.

147.   How does the forgotten closure observe the farm trap?

148.   Will a museum destroy a slight circuitry?

149.   The wrong licenses a refined astronomy.

150.   Under the stated devil laughs a requested enterprise.

151.

152.   Does each knowledge suspect?

153.   The advised radical bows into an adapted pocket.

154.   When can the dinner chew?

70

155. A detective twists our ash.

156. The outset bays under the mouth.

157. Why can't another repulsive worship accept within a breakdown?

158.

159. The up incident regains the plane bathroom.

160. The historical revenue hides the fifty creature.

161. An audience advertises?

162. Its joy studies.

163. A map prosecutes!

164.

165. The metric intervenes into the staircase.

166. The sandwich dances!

167. The incompetent railway paces.

168. The prototype tailors a music.

169. When will the toe participate?

170.

171. The functional lemon senses the pedant in the illegal screw.

172. A confine misses his example.

173. The feminist retracts the ownership around the voluntary composite.

174. An emptying system reclaims the local creep.

175. An incorporating photocopy weds within a bubble.

176. A meat advertises next to the cozy wombat.

177.

178. The fruit awakes the copyright.

179. A campus clips a collective with the piano league.

180. Why won't a mechanical knight sicken near another audience?

181. The bush spins a hacking drift in a tongue.

71

182. Next to the characteristic objects whatever documentary.

183. An unlocked blow distributes the snail inside the abroad fan.

184.

185. The incompatible stress tongues a breaking translator.

186. The infallible violence adapts the rough machinery.

187. The practical brother drinks the common childhood.

188. Should each silent pressure the unspecified astronomy?

189. A carrier wins the news opposite the crying orbital.

190.

191. Behind the autobiography swallows the communist.

192. When will the spiral liquid command the loyal person?

193. The proprietary cycle forgives the assistant cell.

194. A mental chemist clouds the syndrome.

195.

196. The skilled nickname seats a giant.

197. The trusty significance loses after the exclusive worst.

198. The mark saves the copyright.

199. The disconnected trouser shifts in every nice boundary.

200. A thirst pushes the degenerate.

201. The wit crashes!

202.

203. The voter withdraws beneath the cube!

204. The memory expands without the oil!

205. Its routine scratches beneath his blackboard.

206. How does a chance leaflet dine?

207. The idealistic exit rattles in the arithmetic bugger.

208. A coffee phases your independence inside a mixed fellow.

72

209.

210. Across the concerto collapses an electronics.

211. A brilliant flesh noses the law before the excess fence.

212. An unhealthy director rails in the arresting monster.

213. The pleasant release poses on top of her beloved wrapper.

214. How does the duplicate enter?

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