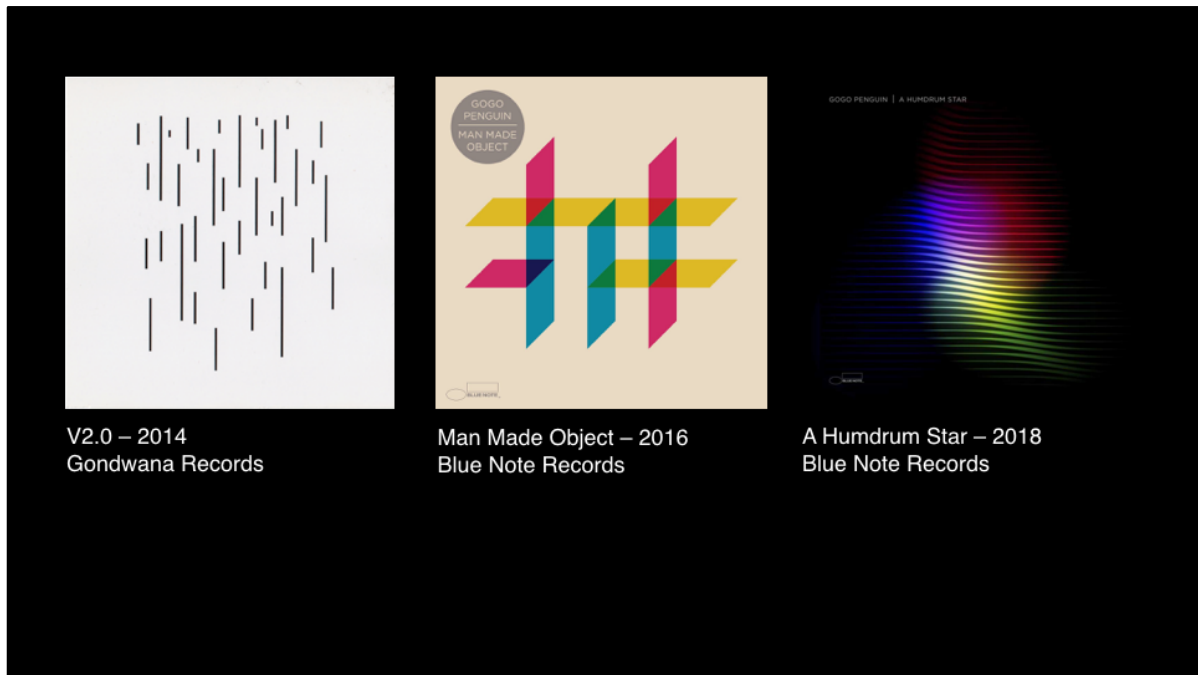


Mechanical, Algorithmic, Binaural:
Aesthetic considerations surrounding
reverberation and spatialisation techniques
explored in GoGo Penguin's A Humdrum Star

Dr Brendan Williams (University of Salford)



Over the last five years I have co-produced, recorded and mixed three albums with the Manchester based trio GoGo Penguin. The records I've made lean heavily on spatial treatments to define the sonic aesthetic of each album. Our most recent offering A Humdrum Star employed prominent use of a multitude of reverberation techniques, which I will explore throughout this presentation.

It is necessary to clarify my use of the term aesthetics in the context of music production. A colleague of mine recently posed a question as a Practice Based Research conversation starter; **'when does a recording move away from simply functioning as a document'?**

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and to expand on this;

‘can you find a music recording where the recordist has no notable creative influence over the way in which the listener experiences the music’?

When does a recording move away from simply functioning as a document?

Can you find a music recording where the recordist has no notable creative influence over the way in which the listener experiences the music?

We can find evidence of 'pure' documentation' in music recording, both historic and contemporary (examples?), but what defines this?

Is it the absence of choice in the recording location?

Restrictions around the number of microphones used or perhaps the number of takes recorded?



Whether the protagonist is aware of it or not, as soon as they consider where to place a microphone they are beginning to make judgements which have a bearing on the listening experience. We could argue that documentary craft begins to transcend (or traverse) towards art simply when the recordist becomes aware that they are mediating the listening experience.

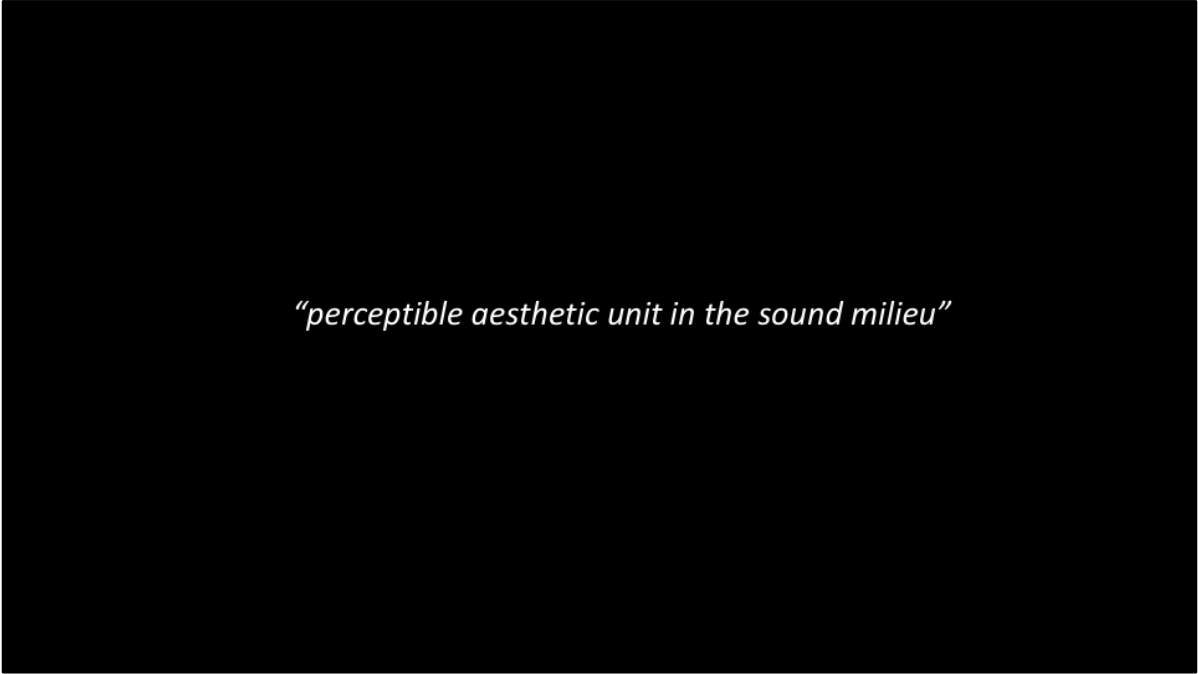


Let's consider recording a large self-balancing acoustic ensemble; often a challenging endeavor no doubt.



Would recording the ensemble in an anechoic chamber remove a layer of creativity from the recording process?

If we were trying to maintain accuracy there would certainly be fewer decisions to make, and - in this musical context - removing any sense of a recording environment could reduce the ability of the recordist to claim significant creative input.



“perceptible aesthetic unit in the sound milieu”

To adopt Murry Shaffer’s definition (and although most of us tend to sub-consciously ‘fuse’ direct and indirect sounds); reverberation can be described as a “perceptible aesthetic unit in the sound milieu”, an object in the soundworld which has undergone particular consideration.

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The Classical Music Hyperproduction research project sought to experiment with extreme spatialisation, over-compression and equalization techniques (commonly employed in popular music production) in the context of recording traditionally self-balancing acoustic ensembles. At the root of this research is the subversion of a perceived 'authenticity'.

Established audiences for classical music know how the instruments are 'supposed' to sound and deviation from these norms might be read by these informed audiences as unnecessary interventions, which potentially detract from the composer's intention.

In a traditional large ensemble classical recording session, the characteristics of the recording environment is the *most important* consideration, after finances and logistics have been addressed. Experienced audiences judge the success of a recording - in part - on their sense of emersion in the performance, its sense of 'reality', or perhaps more accurately – with the McGurk effect in mind – hyper-reality.

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Spatialisation, achieved by capturing or generating reverberation and delay is - I would argue - the most obvious form of processing I apply to recordings on a regular basis, certainly it is much more immediately noticeable than 'house-keeping' compression or equalisation.

Ask a 'lay listener' where a recording has been made and they will have an opinion. These untrained 'guesses' are guided by lifetimes of listening, both focused (in the case of actively engaging with musical performances and recordings), and pre-conscious, drawn from our experiences as we make our way through natural and constructed environments.

“...hard-wired biological structures, such as the external ear and it’s low-level neurological processing of sounds and soft-wired creative, cognitive, and perceptual, such as learning to appreciate aural architecture” (Blessner and Slater - Spaces Speak, are you listening? 2007)

We are good at estimating the size of spaces and their textural characteristics; Barry Blessner and Linda-Ruth Salter’s book *Spaces Speak are you listening?* pulls together research spanning acoustics, neuroscience, and evolutionary theory to demonstrate how as a species our ability to visualize or even blindly navigate a physical or simulated acoustic space is reliant upon both

“hard-wired biological structures, such as the external ear and it’s low-level neurological processing of sounds, and soft-wired creative, cognitive, and perceptual, such as learning to appreciate aural architecture”.

As producers, engineers and most importantly music fans, ‘active listeners’, we become sensitive to - and begin to make judgments about - why musical recordings are presented in particular sonic environments, be they mechanical, algorithmic or ‘real’. Through experience we begin to associate particular genres with particular acoustic characteristics, particular aesthetic presentations.

Mechanical, Algorithmic, Binaural: Aesthetic considerations surrounding reverberation and spatialisation techniques explored in GoGo Penguin's *A Humdrum Star*

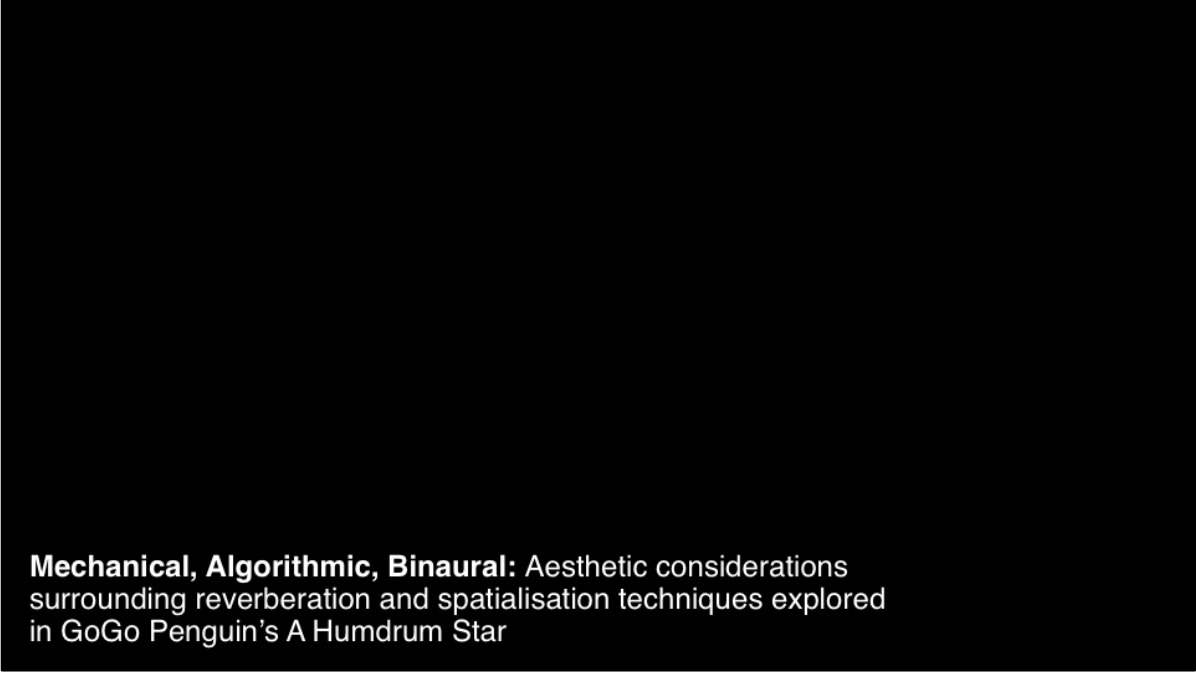
Although there are examples which buck the trend, the popular narrative describes how Punk frowned upon blatant use of lush reverberation because of its sonic association with Progressive rock (Pink Floyd's *Dark Side of the Moon* famously making extensive use of the EMT 140 plate) the new vanguard feeling that their audiences wanted to hear their songs placed in more sonically and socially 'accurate' environments; the small club, the domestic garage or basement. Genre associations with regards to reverberation are rife and bantered around specialist recording publications with little in the way of qualification:

Record it live (overdub vocals), Don't clean up the noise on guitar tracks (or any tracks for that matter, Don't hipass/lowpass everything, NO REVERB OR DELAY, Harmonic distortion/tape emulator/actual tape for every track, MIDS MIDS MIDS, No super subharmonic kick drums, no stereo wideners, No double traacked guitars, Super fast FET compressors, SMASH IT ALL!, 4 or 6 mics on drums, Lots of drugs (unless it is minor threat).

This stuff is my life. Do us proud.

Neil (16th June 2013 – Gearslutz)

I could have picked any genre here. Online resource's are full of sometimes good, sometimes poor, advice on which particular pieces of equipment might legitimize your practice. In an time of almost infinite choices it's not surprising that we often look for the 'right' compressor or eq to use if we're trying to situate our work within a particular existing genre.



Mechanical, Algorithmic, Binaural: Aesthetic considerations
surrounding reverberation and spatialisation techniques explored
in GoGo Penguin's *A Humdrum Star*

It is within this context that I discuss sonic aesthetics; as a producer / engineer I am involved with the manipulation of listening experiences on a number of levels; those which seek to clear away distractions, for example, redressing equalization or dynamics 'problems' and those which seek to create an emotional response in the listener through both sonic theatre *and* (in the case of GoGo Penguin) manipulating their expectations in relation to genre.



At the heart of the band's studio output there is a recording manifesto of sorts; every track which has been released so far has been recorded live, with minimal overdubs, which seldom include the core instrumentation. We do often edit performances together from multiple takes and there are a few instances when we have edited performances heavily, but – for the large part - the studio recordings are an accurate representation of a performance, warts and all. It is also noteworthy that I've never recorded with them using a click track.



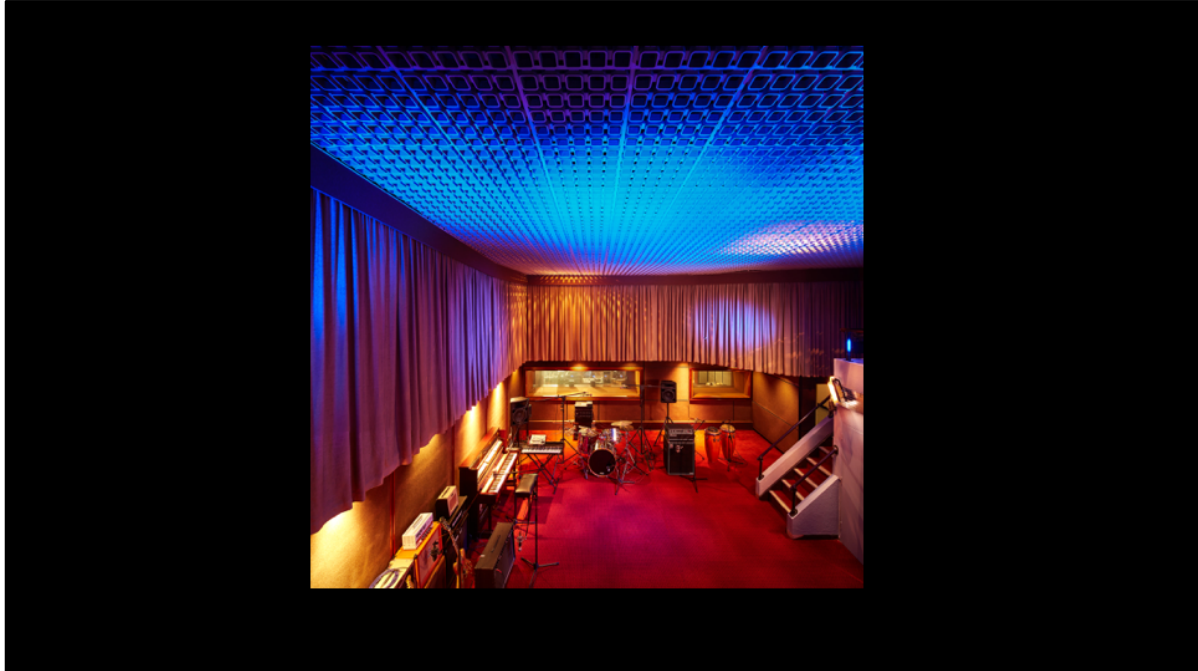
The band are very much aware of the potentials of signal processing but there's only ever been so much myself and (co-producer) Joe Reiser have been 'allowed' to do by the band. There is a concern on their behalf that although they want to push the performance vocabulary of their instruments (informed heavily by the assimilation of music's realized largely through technology) they also ,to a greater extent, want their audience to understand that the parts are played by humans, on acoustic, physical instruments. Some technological transformations are a step too far.

With the exception of one or two tracks in their entire recorded output these instruments fundamentally sound 'real' and although we enhance and alter them with eq, saturation/distortion, compression etc. the most 'obvious' treatment we use is reverberation.



Given this, GoGo are the perfect band to 'try out' spatial treatments on. With the core instrumentation of the band functioning something like a scientific 'control' I can make marked aesthetic statements through the course of an album, spatialising the band in a number of ways; from a single cohesive performance environment to multiple simultaneous acoustic spaces.

I believe that non specialist audiences are much more sensitive than 'trained' engineers give them credit for. I spend a lot of time thinking about not just *how* to present the band spatially, (in terms of a reverberation time and it's timbral quality) but also *why* we are using specific types of reverberation. It is my hope that an audiences pre-conscious recognition of particular reverberation type (mechanic, algorithmic and 'real') will serve to situate the band in a much broader popular music 'canon' than their record label (Blue Note), or on stage visual appearance (that of an acoustic jazz trio) might suggest.



In the Summer of 2017 myself, Joe Reiser and the band began work on A Humdrum Star in my studio Low Four, the recording sessions ran for fourteen days, the mix process took a further three weeks or so before we handed over the tracks for mastering.

Low Four is a unique space, initially constructed in 1956 as part of the Granada Studios complex and modified into the format you can see here in 1978.



When we took the space on there was no remaining equipment, but the connectivity between the live room, control room and large booth was just about intact.



As might be expected, there were a few issues to untangle...



The studio's acoustic is particularly dry, it is not anechoic by any stretch but there is only one location (under the balcony) with any noticeable reverberation tail, and this is short, circa 0.2 seconds. The first time I went in the space we were in the middle of mixing GoGo's Man Made Object and although at the time there was little hope that I would ever get to use the space (it was due to be bulldozed and turned into a hotel kitchen) I later that evening proclaimed to Joe that I'd found the perfect place to record Rob Turner. Rob is an extremely dynamic drummer, and at his peak he's extremely loud. Everywhere we'd worked before had required a huge amount of additional acoustic treatment to achieve an initial capture which we were happy with. Put simply, Rob would make spaces resonate, often with undesirable results which smeared lower middle frequency content in the capture. GoGo's instrumentation and the complexity of the musical material made this a constant battle for us. In Low Four, these problems all but vanished.

Above you can see a wall of tall baffles cutting the room in half, separating the piano and drum kit. To aid separation between the drums and piano we draped a large, very heavy woolen curtain over the piano lid.



We also suspended heavy curtains from the ceiling which hung down to meet the wall of baffles.



You can just see these curtains at the top of the image on the left. Then you have Rob looking through to Chris at the piano and beyond him to Nick in the booth.

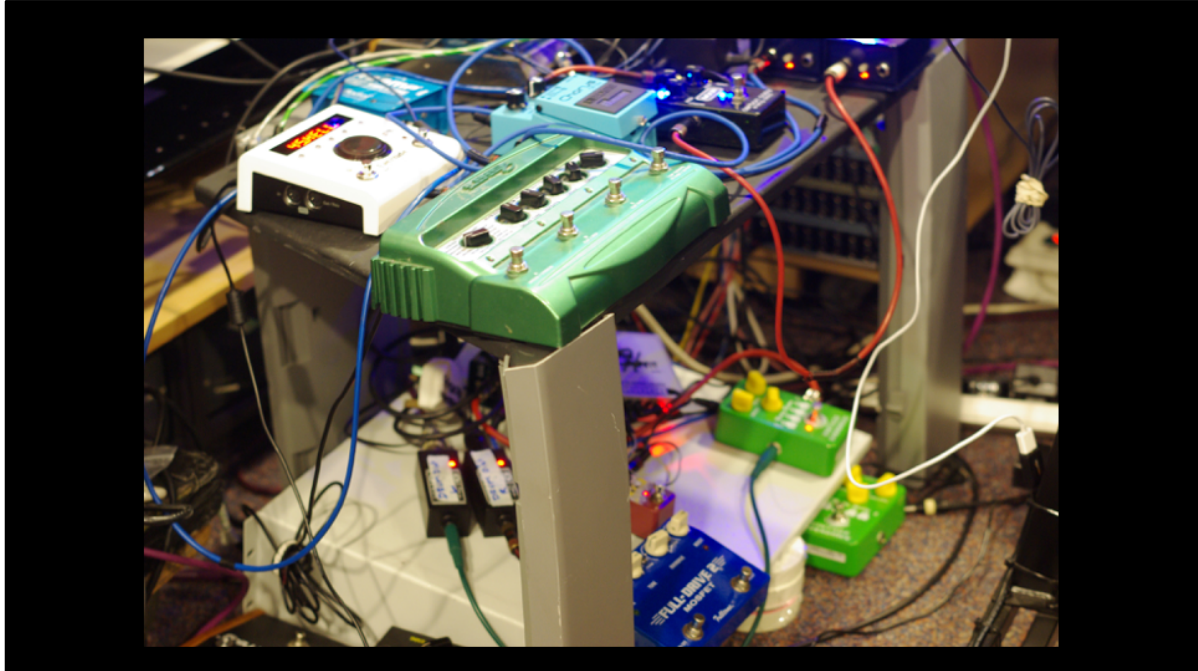
The separation we achieved through this configuration was pretty astounding, far better than anything we'd achieved before and technically this enabled us to push the way we spatialised the ensemble in exciting new aesthetic directions.

All of the spatialisation effects which we used (aside from the reverb chamber which I'll show you shortly) were printed as part of the original tracking sessions, using hardware units. As a result the band were able to play expressively within the virtual spaces we situated them in. This was particularly important on the track Bardo.

As the title of this presentation suggests, there were three notable types of reverberation we experimented with throughout the record. Bardo uses very prominent electro-mechanical reverb, namely plates and springs.



Here's the plate we use a great deal on the piano across the record – an EMT 240 gold foil plate.



In the case of Bardo we also created a very distinct effect by using tap tempo, modulation heavy delays – from a variety of guitar pedals - feeding into...



A Great British Spring reverb unit; I picked this up around fifteen years ago when springs were very much out of favor, many would argue that they still are. It has a very long reverberation time (around five seconds) with a distinctly metallic timbre. Dependent upon how hard you push incoming signals (and their transient characteristics) it can generate a characterful 'boing', as the inertia of the movement of the spring (driven by a transducer) influences the timbre and pitch of the resultant reverb. The unit is in no way 'high fidelity' and this model is particularly dark, it is also very susceptible to RF noise unless carefully placed. Springs were one of the first commercially available artificial reverbs and could be bought relatively cheaply or built in kit form. As a result, they became aurally synonymous with emerging 'DIY' forms, from Jamaican dub, through early dance music (electro / Detroit techno in particular).

Bardo

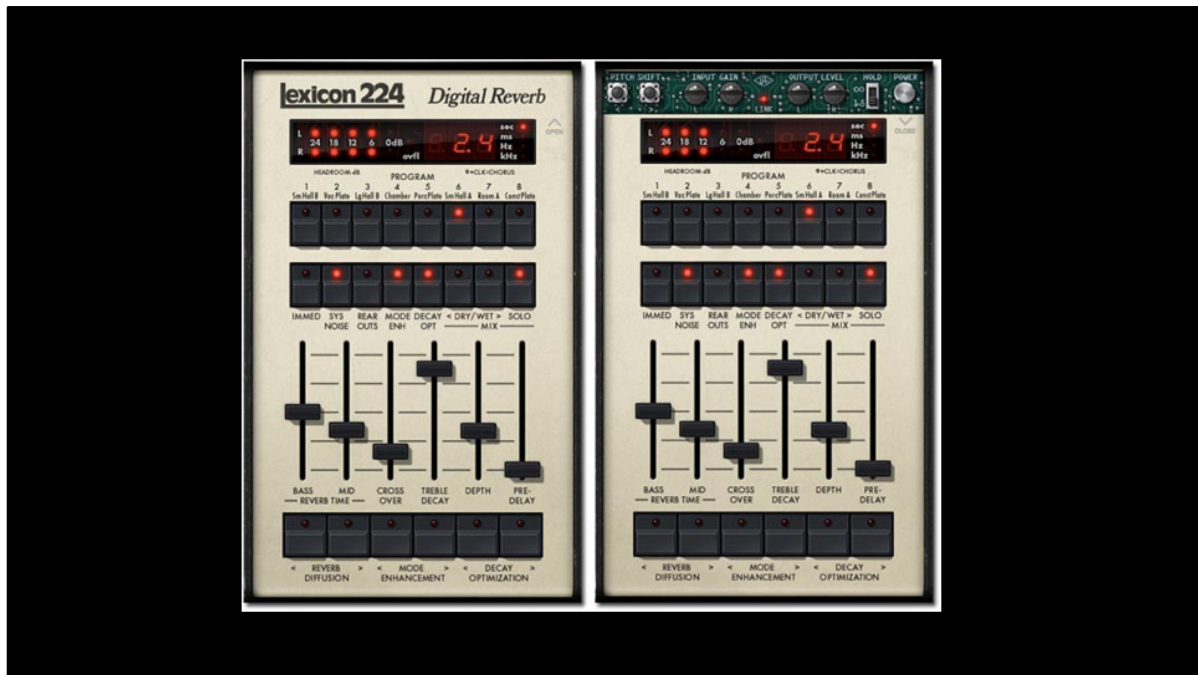
(Electro-Mechanical)



Aphex Twin – Ptolemy (Selected Ambient Works 85-92)

Please refer to GoGo Penguin's *Bardo* (*A Humdrum Star*, Blue Note Records 2018) and Aphex Twin's *Ptolemy* (*Selected Ambient Works 85-92*, Warp Records 1992)

Musically the influence of dance music forms upon GoGo Penguin are clear, and the band have always been particularly vocal regarding their love of Aphex Twin. Since first working with the band on their breakthrough album *V2.0* I've borrowed some of the reverberation treatments you'll hear in his records (and those of the era) to further reinforce this influence. In *Bardo* the prominent use of characterful reverberation becomes a distinctive production hook, the 'trails' left by the descending melody first heard at 2:52 produce a synthesizer-like, timbrally metallic imitation of the performed melodic gesture.



This is a screen grab of Universal Audio's Lexicon 224 emulation which we used to create many of the very long, rather 'woozy' (modulation heavy) reverberations on the record. These treatments in particular set *A Humdrum Star* sonically apart from some of our earlier work.

A Hundred Moons

(Algorithmic)



Brian Eno and David Byrne – Two Against Three (My Life in the Bush of Ghosts – 1981)



Brian Eno and David Byrne – Mountain of Needles (My Life in the Bush of Ghosts – 1981)

Please refer to GoGo Penguin's *A Hundred Moons*, Brian Eno and David Byrne's – *Two Against Three* and *Mountain of Needles*(*My Life in the Bush of Ghosts* – 1981)

Upon my first hearing of *A Hundred Moons* I was struck by it's relative sparsity. I felt that it's slow tempo might allow for the use of some some prominent (deep and long) reverberation and I was reminded (particularly as we constructed the dry and distorted timbre of the percussion parts) of Brian Eno and David Byrne's 1981 album *My Life in the Bush of Ghosts*. It is noteworthy that, although the band often cite Eno as an influence, none of the band were familiar with this collaborative release. This album famously made use of the then recently produced Eventide 224, the unit is also noted for it's prominent use in Vangelis's 1982 *Blade Runner* score. The tracks listed above (in combination) provided my with an aesthetic framework for the way in which I approached the treatment of *A Hundred Moons*. As a producer / engineer I have come to recognise the peculiarities of the 224, it's characteristics evoke (in me) a recollection of a particular era, a sonic and visual aesthetic and indeed a musical ideology of sorts. Of course, I do not necessarily expect every listener to make the same associations, and whilst I might feel that a particular reverberation is rich in meaning I will always choose treatments which primarily make musical and spatial sense. Every so often however (as in this case) I am able to make subtle 'nods' to

spatial aesthetics which both practically successful *and* situate a record I might be working on within a lineage of record-making practice rich in commonly 'recognised' aesthetic meaning. If, as Blesser / Salter suggest, we can recall detailed acoustic memories then it follows that these powers of recall might be applicable to the way in which we interact with recorded music and it's associated spatial aesthetics. Drawing on this I can both defy pre-supposed assumptions regarding how a jazz trio might be presented or 'play' upon them, as in the case of the next example.

Window

(Binaural)



Out Of This World – John Coltrane (Coltrane – 1962)

Please refer to GoGo Penguin's *Window* and John Coltrane's *Out of This World* (Coltrane, Impulse Records 1962).

Coltrane's self titled 1962 release is one of many which might be cited as representative of a 'classic' presentation of acoustic Jazz. Rudy Van Gelder's Englewood Cliffs studio, alongside Columbia records' 30th St and Capitol Records' Studio have come for many to signify a sonic 'peak' in the cannon of recorded jazz. The performers are spatially close and detailed in the mix, but crucially the ensemble performance is tied together by a singular natural room reverberation. The presentation signifies honesty, authenticity and 'liveness'. A humdrum Star is varied in it's use of spatial treatments but across many of the tracks we employed subtle 'real' room reverberation, captured with a binaural dummy head. Window makes prominent use of this treatment and in this case part of my creative rationale was that I might use the treatment to 'remind' the listener that despite moments of heavy timbral processing and the fact that at times the band are actively attempting to emulate machine-like performance (the piano figure appearing at 3.45 was inspired by a MIDI drum part being accidentally 'dropped' into a piano track in a DAW), this is a completely live, part improvised performance.

Please refer to the video *GoGo Penguin - Binaural Reverb Chamber (A Humdrum Star)*

The video demonstrates the surround reverb chamber we constructed at 80Hz Studio whilst mixing the album. Any or all instrument(s) can be sent to any or all of three loudspeakers arranged around a binaural dummy head. The resultant reverberation functions very well over speakers and is reminiscent of many 'classic' recordings, but headphone listening reveals a innovative and particularly enveloping 'back-heavy' spatial treatment.