

The Music Technologist as Collaborator
in the Contemporaneous Co-Creation
of Audio Artefacts

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Description of Digital Assets by Directory and Subject

The pen drives supplied in this document are organised in accordance with the format of the document. The text refers to digital assets by exact name. Assets which are not included on the albums which form the outputs (demo's, videos and illustrative mixes) are prefixed with a number referring to its associated output and position in the text.

A digital copy of this document (.pdf) is stored in the root directory.

Part 1: The Engineer as Archaeologist

Part 1 Outputs (Album tracks in.wav format)

Output 1: Nat Birchall – Akhenaten

Output 2: Matthew Halsall – Fletcher Moss Park

Part 1 Video (video clips in .mov format)

2.1 The Sun in September (Gondwana Records 2012).mov

Part 2: The Embedded Producer

Part 2 Outputs (Album tracks in.wav format)

Output 3: Dutch Uncles – Out of Touch in the Wild

Output 4: Dutch Uncles – O Shudder

Part 2 Demo's (Demo material in various audio formats)

3.1 Proggy Jean.mp3

4.1 The Senator DEMO 1

4.8 Tubas DEMO.mp3

4.9 Tubas (Accelerate) Demo 6.mp3

Part 2 Video (video clips in .mov format)

4.2 GW Live Room Kit Setup.mov

4.3 kit build stop frame.mov

- 4.4 kit mics up stop frame.mov
- 4.5 kit cable stop frame.mov
- 4.6 Tidal Weight Synths_2.mov.
- 4.7 Tidal Weight Guitars.mov
- 4.10 Accelerate New Bass Parts.mov
- 4.11 Accelerate Delay Snares.mov

Part 3: Shaping the Jazz Aesthetic – Acoustic Electronica

Part 3 Outputs (Album tracks in .wav format)

- Output 5: GoGo Penguin – V2.0
- Output 6: GoGo Penguin – Man Made Object

Part 3 Examples (Audio examples in .wav format)

- 5.1 Murmuration Effects Mix.wav
- 6.4 All Res Chamber Mix.wav

Part 3 Video (video clips in .mov format)

- 6.1 Drums Branches Break GW.mov
- 6.2 Purple Double Stick GW.mov
- 6.3 80Hz Chamber Sweep - Protest.mov

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Abstract

This PhD portfolio of commercially available album releases exemplifies aspects of my practice as I have navigated through the roles of engineer, producer, composer and collaborator over an eight-year period. The six outputs explored are drawn from a wider catalogue of over twenty album credits. The commentary explores my technical methodology in great detail and aims to make certain aspects of my practice technically repeatable if desired.

Recordings embody knowledge, arrived at through constantly evolving methodologies which synthesise techniques spanning over one hundred years of technical and creative practice. My own practice is broad (in terms of both genre and breadth of engagement) and as a result I am able to draw from practices which often remain distinct, in order to enable creative success and contribute original knowledge.

The outputs have been reviewed in both broadsheet and specialist music press outlets, received nominations for and won national music awards and contributed significantly to the steadily building success of the artists I have collaborated with.

Central to the notion of the contemporaneous co-collaborator is a discourse centred on how music technologists shape the aesthetic of a recorded artefact in consultation with the artist(s) they work with, in light of a set of creative criteria arrived at through both formal and informal dialogues and extensive shared listening. A progression towards mutual understanding unfolds slowly through time and establishes the culture within which a record will be made. A recording captures both sound and culture, the relationships of the key collaborators are the framework on which the artefact is built.

A motivation behind the development of the submission is to demonstrate, through detailed analysis of the record-making process, how historical

notions regarding the role of the music technologist have become increasingly outmoded. Constant changes in the way in which music is recorded, mixed, distributed and consumed have rendered many historical descriptors vague at best and often unrepresentative of the work undertaken by the contemporary music technologist in the realisation of an album project.

Whilst not seeking to propose a new terminology the commentary shows that the roles attributed to music technologists in the sleeve notes of records (if indeed there is a physical release) are often anachronistic. The current financial state of the music recording industry has resulted in a radically altered landscape for the music technologist. There is often simply not enough money available to employ people with distinct boundaries. We find ourselves acting as tea boy / girl, recording / mix / mastering engineer, producer, composer, performer and psychologist on a regular rotating basis.

Introduction: Formative Activity

I came to music at an early age, playing drums, guitar, keyboards and singing a little from the age of around eight. When I was eighteen I made the decision to study fine art at University. I had toyed with the idea of studying composition but I think being asked to transcribe the second violin part from a long forgotten Brahms symphonic excerpt (as part of my A Level Music studies) scarred me irreparably at that tender age. I loved music deeply and I was playing seriously in various bands, but I had no clear idea that I might have been able to study popular music or anything related to music technology at the time at HE level. So off I went to spend four years making music at art school.

Over the course of those four years I was lucky enough to meet some people who knew a good deal about electronic music production. I spent the entirety of my student loan on a PC, which had the capacity to deal with both MIDI and a small amount of audio recording and processing. I worked on an instrumental Hip Hop project with a DJ I met at university who had older brothers deeply immersed in Manchester's music making communities. I was serious about both my composition and my playing and through these connections found myself recording guitar, percussion and bass for a number of dance music oriented producers. I was afforded time experimenting with them in their project studios and began to get to grips with the technology involved in a more developed way.

In 1998 I was asked to join the band Oar, whose members were a few years older than me, with a good deal more experience and connections. Whilst on stage I played percussion and sang harmonies, I also began to record demo's with them. I was by this time synchronizing an 8 track $\frac{1}{4}$ inch reel to reel machine with my computer, affording a previously unimaginable twelve tracks of discrete input / output. The results pricked the ears of a local independent record label owner who expressed a desire to release them. I recorded a lot of material with Oar and began to incorporate what I'd learned about beat construction, sequencing and audio editing into our work. There were many

false starts and a couple of line-up changes but we eventually signed a subsequent deal with a label who funded a little time in some really interesting facilities.

The two studios which introduced me to a 'professional' environment were Chappell Studios in Lincolnshire and Ape, on the Wirral. Here I worked with some bona fide engineer / producers who earned a living making records. With Jim Spencer (Chappell) we were predominantly mixing my recordings and with Lance Thomas (Ape) we were being engineered and produced, which was an entirely new experience for me.

Whilst being produced by someone else I began to realise that what I had previously been engaging in was also production, as well as engineering and some composition to boot. I had never really stopped to consider the distinctions between the disciplines but I now understood that audio professionals had specialisms. I remember Jim Spencer saying that he enjoyed the mixing process most of all, as he was able to aesthetically define a 'finished' product. I remember Lance at the helm of Ape, jubilantly muttering "this is how they did it!" whilst listening back to some of our 1970s influenced psyche folk which he had just recorded, in a studio utilising no equipment manufactured post 1972.

In hindsight, I was very naïve about the whole process of record-making but simultaneously convinced that it was something I could do, if I worked hard and drew from people with more experience than me. At the time however, I had not considered that I could record other people that I was not actively writing or performing with.

Whilst in my final year of university I was contacted by my former piano teacher Phil Brissenden, who had started working as a music technician at the University of Salford. When I finished my own degree I spent the summer helping to re-wire some of the studios in exchange for access to the facilities. The following September I was offered some shifts as a studio supervisor, often overnight, finishing at 7am. This was the most formative thing which happened

in my career. Of course, things could have spun off in many possible directions but I was incredibly grateful and indeed very lucky to have found myself in a situation where I could learn more about this practice which I had become so thoroughly bound to, away from either a traditional studio internship (a position which I did not know existed at the time) or formal academic study.

It was a very different climate in HEI's at the time, although I knew a little bit about music technology there was an awful lot more which I did not. I was paid to look after the facilities and help the students in the studios if I could, but I was not employed as a 'technician demonstrator'. I was not required to know everything about the studios' signal path as one might now be expected to in a university environment, I was a knowledgeable caretaker of sorts. However, each time I could not solve a technical problem I felt rather awful and made it my duty to find the solution. By broadening the remit of my job I learned a huge amount in a relatively short period. It was a wonderful time, there was almost always a studio free through the night shift, so I worked my way around the facilities and eventually both the much-expanded analogue architecture I was used to and the new frontier of 24 track digital recording / routing began to make technical sense. The following year I was working regularly and also doing some low-level teaching.

There were some very knowledgeable people around of course, most notably I was taken under the wing of Bill Leader. Bill is a legendary figure in British folk music, this description is for once no exaggeration. He has been involved with making hundreds of albums in his long career, some of which have been hugely influential, works by Bert Jansch and The Pentangle being amongst my personal favourites. Bill was the first person I met who was deeply knowledgeable and passionate about recording acoustic instruments. Whilst I had of course done this, I did not – if the truth be told – know much about what I was doing. I felt that I knew when something sounded 'good' and I was aware of some 'standard practice' but Bill opened up a world of possibilities regarding microphone technique and, most importantly, was able to articulate how techniques had developed over the course of recording history (he is now 87). By experimenting with these techniques I became more confident in making

decisions which were informed both by the practical recording 'problem' at hand and a sense of aesthetic judgement: How might this band sound if we applied a technique which sounds and 'feels' like a 1950s recording rather than using current industry standard practice for example?

More important than any technical knowledge which Bill imparted (the names and configurations of microphone arrays etc.) was the way in which he made me aware that recording could be regarded as an art form in itself, or at the very least a collaborative effort to bring a piece of art into the world, a co-creation. By understanding microphone technique we are able to consider how our initial engineering / production decisions influence how an audience experiences the 'sonic image' we present. One recording technique can be arguably more accurate than another, but broad accuracy alone may not appropriately support the music we are trying to capture and present. In photography, an incredibly detailed image with a deep depth of field may indeed present 'too much' information and ultimately dilute or alter the perception and impact of an intended central point of focus in the larger picture. The same can be said of recording. Sometimes we do not want to experience a performance from a single perspective only, the 'best seat in the house'. Sometimes it is creatively beneficial to present multi-perspective detail, a hyper-reality which mitigates the lack of visual information when listening to a recorded work. A soundstage is both wide and deep and I began to understand that through careful consideration I could manipulate the way an audience experienced a piece of recorded music, mediated by my creative decision making.

I began to take on some commercial work through the studios whilst simultaneously continuing to work on my own composition and performance projects. Whilst the parameters have changed, I have maintained this plurality to date: I teach, I compose and I work professionally as a producer / engineer and these disciplines inform each other endlessly.

Introduction: Research Focus

This document will explore three distinct areas of practice through detailed case studies of six albums. The commentary reflects upon a navigation through the roles of recording / mix engineer, producer and composer through a first-hand account of the record-making process in order to demonstrate an original contribution to knowledge. These roles often overlap, and there is confusion amongst the non-specialist public and musical communities alike regarding just what exactly these specialisms entail.

The role of the recording engineer is often defined simply: an engineer is responsible for ensuring that instruments are captured accurately, that a recording session runs technically smoothly, resulting in a non-disruptive workflow and promoting a creative environment for composers and musicians. Expanding on this final point, Vandemast-Bell, Werner, & Crossley state that “The primary role of the recording engineer is to establish an environment conducive to creativity and that allows musicians to perform their best” (2015). However, the creative remit of the engineer is only definable in relation to that of the producer, if one is present or required. As this commentary exemplifies, defining a participants’ role (both formally and informally) in the process of record-making is all-to-often a contentious affair.

Richard Burgess’s book *The Art of Music Production: The Theory and Practice* (Burgess, 2013) opens with a commendable attempt to define the multifaceted role of the producer:

Music production is the technological extension of composition and orchestration. It captures the fullness of a composition, its orchestration and the performative intensions of the composer(s). In its precision and inherent ability to capture cultural, individual, environmental, timbral and interpretive subtleties, along with those of intonation, timing, intention and meaning (except where amorphousness is specified), it is superior to written music and oral

traditions. Music Production is not only representational but an art form in itself.

Burgess goes on to propose six 'Functional Typologies' of producer and further subsets (9-22). Whilst recognising the worth in this study Mike Howlett observes, "The limitations of Burgess' categories are that they both overlap and under-represent: where does the engineer, for example, fit in this scenario?", going on to suggest in his article *The Record Producer As Nexus* (Howlett, 2012), a summation of the skills associated with the role.

- Arranger/Interpreter/Visualiser.
- Engineer.
- Creative Director/Performance Director.
- Logistical Facilitator/Project Manager.
- Psychologist/Counsellor/Priest.
- Mediator—between the objectives and aspirations of the record company and the artist.

Howlett elevates one of these skills, stating that,

One role, the Project Manager, is probably the most universal, and the one that defines the difference when, for example, an engineer becomes the producer. To be appointed producer of a recording means all the decisions about process—where to record, what to record and in which order, whether a given performance is right, and when the project is completed—are your responsibility.

The role of the record producer is understood to be distinctly different when considering genres and musical cultures. In Hip hop for example the producer is often both the recording / mix engineer and composer of all musical artefacts excluding a vocal performance. Why then not simply call them a composer? The answer lies primarily in the way the music is constructed. For example, a

Hip hop producer may not play any conventional instruments, composing via sampling and sequencing alone. One might argue then that this is not composition at all, as the process does not engage with the historic notion that the act of composition results in a series of instructions to be followed by instrumental performers (the score being the primary artefact). However, there is a clear parallel between the way much music concrète (and subsequent acousmatic / electroacoustic music) was constructed and the way in which many contemporary Hip hop producers abstract existing audio recordings beyond any truly recognisable original state to form a unique artwork. Sophie Smith explores this parallel in her book *Hip-Hop Turntablism, Creativity and Collaboration* (Smith, 2013)

Many Hip hop producers construct or record their samples 'from scratch', adding further confusion to one's ability to define the compositional act through traditional notions of authorship alone.

A producer in the context of western art music is responsible for ensuring that a composer's intentions are accurately represented, whilst considering the interpretation of the conductor or ensemble. However, a producer in this field relies on the skill of the recording engineer to capture an accurate representation of the performance in a particular environment. This producer might not place any microphones or indeed touch a recording console, they may make suggestions in order to shape the soundstage (resulting in a definable sonic aesthetic) but their responsibility is heavily weighted towards grappling directly with the intricacies of a musical performance. In a typical recording session, the producer will compile a list of takes which an engineer will cut together to form the 'perfect' representation of the work.

As you can see, this is an entirely different musical relationship – which shares the same name – to that described in the previous example, in that the role of the producer is understood to be something completely different, dependent on musical culture.

For longer than it did not, the academy viewed the act of recording purely as a process of documentation. And if musicology scholars did acknowledge that the process could successfully mediate our appreciation of a 'pure' performance, then they did so with suspicion. Latterly the landscape has begun to change. The 'Classical Music Hyper-Production' project seeks to actively question why the established classical world has not followed the lead of theatre performance by adopting contemporary performance values and presenting established works within the framework of current technology.

“The world of instrumental classical music is comparatively conservative in comparison to other areas of the creative arts where historical works are presented in a contemporary context. The notion of creative contemporary interpretations of a historical text has been explored much less widely in this realm than, for example, in that of Shakespearian theatre.” (Classical Music Hyper-Production)

The fact that even in this most conservative of environments scholars are beginning to investigate and embrace change demonstrates a growing understanding of the role of the music technologist as co-collaborator in the production of audio artefacts.

Methodology

This document is a commentary on outputs spanning eight years of professional practice. There is no qualification which defines someone as a professional in this field and one is not bound by the legal responsibilities of an architect or doctor. This professionalism is defined by the fact that people pay music technologists to make records, there is trust and respect between the technologist and the artists / record labels they work with, defined by their previous encounters and releases. As a professional music technologist one must fulfil creative and technical criteria which are not defined by you alone, and in the context of arts based academic research this represents something of a problem.

Whilst a PHD composer might define their methodology by outlining the development of a global compositional technique applied throughout their portfolio, it would have been unimaginable for me to have attempted to dogmatically force an overarching pre-defined recording / production methodology on to the projects I worked on throughout this period.

But although the development of a single global methodology is not applicable to my practice, there is a definable process which precedes the onset of any recording work to be undertaken. I consider the following before starting a new project:

- Do I like this music enough to devote a portion of my life to it?
- Can I see myself working effectively and happily in the company of the artist(s) involved for long periods of time and in potentially stressful situations?
- How will the music be released, will it actually reach the public in any meaningful way?
- Is the artist(s) ready to record this music, are they capable of playing it well enough to warrant recording it?

- Would it be wise to make demonstrative recordings (demo's) in advance of entering the studio in order to consider the arrangements and the musicians' abilities more critically?
- What would be the best place to record this music and do I have access to such a space in light of the budget?
- Can I communicate clearly with the artist(s)? Through consultation, will it be possible to develop a shared understanding and reference of sonic aesthetics which will guide us through the project and minimise the need for complex, circular discussion whilst in the recording process?

This final point is perhaps the most important in terms of the establishment of a methodology applicable to a forthcoming project. Through the exploration of a series of musical relationships I will outline how I developed bespoke adaptable methodologies for each project I undertook. This was only achievable through consultation with the composers, musicians and record labels I have worked with.

These relationships are successful only through a mutual understanding of the sonic aesthetics which help to define a particular area of practice in the recorded musical arts. Whether or not the participants engage in a conscious intellectual process in order to arrive at this understanding is unimportant. Some artistic relationships initially develop without a professional / financial function in mind, but often (when this form of engagement is present) one's first conversations are referential. The function of these conversations is to assess whether there is enough creative common ground between the participants to pursue the relationship, indeed enough common ground for the recording artist(s) to pay for the services of the music technologist. There are skills which we can develop 'on the hoof' as musicians and technologists, but if somebody asks you a leading question regarding a particular piece of music or period in music history, you could have a very awkward conversation if you lie. Similarly, one would be foolish to reply "no I haven't, but I'm sure that if I had, I'd have something really interesting to say about it". These initial interactions are interviews of sorts, and this analogy works both ways.

And so, to the first, most subjective of the points above: Underpinning an engineer / producer's technical, musical or psychological skill is their taste, defined by the music they choose to listen to whilst at and away from 'work', the music which has accompanied and shaped their lives.

I choose to turn down projects if I do not like the music which I have been asked to record. I have accepted work where I have found the music sonically challenging or that important aspects of the compositional language have required research on my behalf (as has been the case in some of the contemporary music I have worked on), but if I simply feel that something is boring, poorly composed, aesthetically or politically objectionable then I turn the work down. I've learned this lesson the hard way, I will not be recording property developers singing cover versions of Rat Pack classics again in a hurry.

I choose to position myself as a creative collaborator, regardless of accreditation. I stake my credibility on the work I have chosen to engage with. If one knows that the music you have been asked to work with is simply bad, then why accept the job and damage one's reputation? When you love the music you are working with it is much easier to justify why you are working sixteen hour days for very little money. In my experience, it is those who accept that this will be their existence for a good portion of their lives who 'get the breaks'.

Whilst some of the work I have undertaken has explored specifically retrospective practice I feel that my current work is characterised by a desire to bring together practices which often remain distinct, in the hope that something aesthetically unexpected might emerge. Beyond compositional interest or one's response to an engaging recorded performance, the reaction to aesthetic juxtaposition is a vitally important facet of the listening experience, which I aim to explore in my practice. For example, what I have learned whilst recording contemporary classical music has been implemented whilst working in the field of art pop and the multi-speaker techniques required to enable the performance

of electro-acoustic music have been applied to spatialising contemporary acoustic jazz.

Methodology of the Thesis

Each of the three parts of this commentary are formatted in different ways, best exemplifying my technical and creative input to the records discussed. Whilst the reader could choose to read an individual section of the commentary in search of insights regarding a specific record, the document is designed to be through-read rather than treated as a series of entirely distinct studies. The reader is often asked to consider multiple aspects of the record-making process simultaneously, and whilst this might be more challenging to process than a repeat-formatted report, the writing style is analogous to each process and period under examination.

For example, the first part of the commentary focusses on the discipline of engineering contemporary jazz recordings. Part 1, by necessity, explores traditional microphone technique, room arrangement and reverberation principles in depth and demonstrates my understanding of these practices. The recording / mixing sessions which produced outputs one and two are discussed homogenously, rather than attempting a 'track by track' analysis, as the nature of the aesthetic presentation of the material is such that there are no radical alterations to the sound world throughout the course of the records.

Part 2 assumes knowledge of the former. The discussion relating to microphone technique and general technical practice builds on that previously discussed. Whilst this aspect of the recording process is of importance the commentary focusses on a distinctly different engagement with the creative aspects of composition, arrangement and record production. As a result, I choose to investigate the way in which my interventions have shaped specific songs on the outputs (aligned to the pre-stated research focus) rather than what would inevitably become a thin summation of practice across all twenty-one tracks contained on the records.

Part 3 reverts to a more homogenous discussion of the technical processes implemented in the record-making processes and places greater significance on an exploration of spatialisation and timbral manipulation / reinforcement as a key tool in shaping the listeners' aesthetic response to the outputs in the context of the jazz cannon.

This document cites audio examples drawn from the outputs produced and some created specifically for this commentary. In addition, there is a good deal of photographic information within. I enjoy photography and have always made an attempt to document my work as a form of diary but primarily as an aid to my teaching practice. In 2014 I began investigating what form my PhD might take in earnest, settling on the route of 'by publication' towards the end of the year. At this point I began to augment still images with video footage and stop frame content. The artists who I worked with through this period (Dutch Uncles and GoGo Penguin) were by this time friends of mine, they were aware of the reason I was filming the sessions and posed no objection to the camera's presence. It was at first a little strange, allowing this distraction into the working environment of record-making (there is some unused footage where the participants are clearly aware of the camera's presence). However, once the participants understood that I was only interested in documenting technical and performance processes rather than seeking to capture footage that might be used in an ethnographic or linguistic study they became less self-conscious.

Throughout the process of this document's creation I have sought confirmation from the participants that I am representing the events described (some of which happened over ten years ago) accurately.

The commentary cites literature from both the popular and academic field. The academic texts have provided me with a theoretical framework within which I have been able to position my practice. However, their direct influence on the evolving, 'doing based' activity pre-dating formal PhD

study should not be overstated. The majority of the work presented was completed in a period when these texts were unknown to me, as they are unknown to the vast majority of professional music technologists. Retrospectively these texts have enabled me to contextualise my practice. This in no way diminishes their worth, but it does raise some important questions.

As an academic and practicing Engineer / Producer, how might one's commercially available creative outputs (which I propose are of equivalent worth to the traditionally published composition) be situated in an academic framework dominated by ethnographic, linguistic and musicological articles?

In a recent conversation with the Massachusetts based scholar Alan Williams (not my UK based supervisor with the same name it should be noted) we considered this issue. As a conversation starter I proposed that perhaps nothing beyond the record itself was necessary in order to demonstrate an original contribution to knowledge which the recording embodied: The work had never existed before; a unique technical and aesthetic language had been developed in the process of production and a gatekeeper (the record label, comparable in significance to the publishing house), had endorsed the worth of the output.

Alan proposed that whilst this might be analogous to systems in place for the assessment of academic composition (in some countries) that the original contribution to knowledge contained within a recording needed further illumination. He imagined a scenario where I would tell a group of my students that all the forthcoming semester's lessons had been cancelled and that they were simply to study my outputs with no accompanying literature. Would they find worth in the process? Of course, I would like to say yes. Would they be aware of the aspects of the process which I felt were truly notable, the things that constituted new or synthesised knowledge? Possibly not, or at least not all. This conversation galvanised my study, confirmed the need for detailed visual

documentation, a technical format appropriate to each individual output and a contextualisation of the relationships formed in the record-making process. In the arts, practice based research is currently played out on a field which is anything but level but I believe there is room for positive development in my own field and indeed a plurality of output. As music technology academics, we should be able to both write *on* and write *up* our practice and I would hope that this document might stimulate further debate on how to do this.

Part 1: The Engineer as Archaeologist

The act of record-making is now well over one hundred years old and has undergone huge advances in technical complexity throughout this period. We find ourselves at a point in time where cumulative refinements and decreasing production costs have made knowledge and implementation of the myriad processes involved accessible to many practicing musicians, arguably less expert driven and more democratic. Yet despite these developments *Part 1: The Engineer as Archaeologist* describes the creation of records which were a struggle to bring in to existence, by the nature of the period in which they were made, the record-making cultures locally present and the financial position of the collaborators involved.

The research centres on a process involving the gathering together of historical evidence, comprising recordings and photographic materials; the analysis of these materials, including a historical contextualisation of the recording practices in use at the time and conclusions drawn from this study relating to the use of both new and old recording techniques in order that those involved in the artefacts' co-creation produced records which could co-exist with those made half a century ago.

In 2006 I was approached by the then twenty-four-year-old Matthew Halsall, after he had heard some of my small ensemble jazz recordings. Matt held a residency at Matt and Phreds jazz club in central Manchester, leading a band comprised of some of the city's leading performers. Matt was – and is – a fine musician and composer with a highly developed sense of how he felt his music should be presented both sonically and visually. In the last nine years his Gondwana Records imprint has become one of the UK's most respected independent jazz labels, its releases receiving plaudits such as a Mercury Music Prize nomination and winning awards such as BBC Radio 1 Worldwide 'Jazz Album of the Year', 'iTunes Jazz Album of the Year' and MOBO 'Jazz Album of the Year'.

On first meeting, myself and Matt spent a good deal of time talking about music, his tastes were broad. Matt came to jazz through the big band tradition but was equally immersed in electronic music and Hip hop culture. In terms of jazz we shared similar listening habits. Alice Coltrane, Miles Davis and lesser-known artists on the Strata East label (brought to our attention through re-issues on the Soul Jazz label) were high on the agenda. I sensed that Matt was surprised to meet a music technologist who was interested in and had experience of recording jazz, this was a new experience for him.

Matt was dissatisfied with the recordings of his band which had been made in some of Manchester's commercial recording studios and I was interested in understanding exactly what the issues were. To paraphrase Matt:

“it just doesn't sound right; it's too clean; they made us all wear headphones; we couldn't really see each other properly; we were in different rooms”

The studios Matt had worked in had produced many excellent recordings but were primarily working with guitar oriented bands, with very different – genre specific – needs to that of a small acoustic jazz ensemble. Engineers would immediately assume that there were going to be big problems recording all of these acoustic instruments in the same room, and indeed they were – given the relatively small live room environments – most likely right. Recording acoustic drums, piano, upright bass and horns in a small space can be challenging. In order to understand why we need to consider the primary uses of the studios in question.

Recording guitar-oriented music calls for a certain sort of acoustic space, the audience for these musical forms have come to expect a certain sort of sound. In an initial tracking session, the drum kit is often the instrument given the most attention, with guitar amplifiers often being isolated through heavy baffling or placed in separate rooms. It is unusual for a singer to perform simultaneously at this early stage although they might sing a guide part to help with the energy of the performance and provide structural clarity.

It is impossible to accurately generalise, but often an engineer / producer is initially looking for detailed capture of a drum kit comprising close microphones and overhead drum microphones with a little 'room sound'. In guitar-oriented music, the prominence of the room sound will vary as will its perceived size dependent on recording environment, but it is unusual for a drum kit to be regularly presented in a very large space. We can attribute this to many things but on a practical level a very long (more than 1.2 seconds) reverberation time generated by a drum kit occupies an awful lot of the frequency spectrum, it can occupy a lot of available space making it much harder for other instrumentation to retain clarity in a mix. Aesthetically it is also often problematic; presenting a band in a huge concert hall implies something quite different from a smaller, quasi domestic reverberation. There are also socio-political implications and issues of sonic history to consider.

So, the contemporary recording studio dealing primarily with independent labels and self-financing artists often has a relatively lively main recording room, which can be partially acoustically dampened to 'tame' a drum sound a little, however, it is unusual to find a single large room which is very dry (dead) or extremely lively acoustic, either of which might be more useful to a jazz ensemble. Many studios opt for something with a reverberation time of around 0.8 seconds, with fairly prominent near reflections. This creates a sound which has become synonymous with guitar-oriented music, generally the studios target market post 1970. This lively environment with prominent close reflections is really quite problematic when recording a small jazz ensemble performing at their dynamic peak, high frequency content will spill easily between instruments unless lots of heavy baffles are used, but this often compromises the ability of the performers to self-balance and can easily compromise sight lines. It is an understandable reaction to physically separate the band and ask them to wear headphones, as one might in a traditional rock recording session, but this has tangible ramifications for a band's ability to perform with improvisation within natural (acoustic) dynamic boundaries.

The needs of Matt's part-improvising acoustic ensemble had been sacrificed in order to retain an engineer's conventional sense of separation between the

instruments, in order to facilitate contemporary expectations in the mixing process. The results neither sounded like traditional jazz recordings – the aesthetics were ‘wrong’ – nor encouraged a creatively successful performance from the musicians.

We discussed what Matt wanted from future sessions and I formulated a list of criteria which would guide us as we set about working on some recordings.

- The band should play entirely live, with no overdubbing of parts which could be played as a unit
- The band should all be in the same room and they should enjoy playing in that space
- The band should self-balance acoustically whenever possible
- The band should not wear headphones if at all possible
- There should be clear sight lines between all musicians

There were a number of key recordings which we felt represented what we were trying to achieve sonically. Miles Davis’ late 50s to mid-60s output was high on the list, with *Kind of Blue* (Davis, Kind Of Blue, 1959) probably at the top. John Coltrane’s output from the same era was similarly important. The self-titled *Coltrane* (Coltrane J. , Coltrane, 1962) was a particular favourite of mine, Pharaoh Saunders’ *Thembi* (Saunders, 1971) and Alice Coltrane’s *Journey in Satchidananda* (Coltrane A. , 1971) were also often cited. I was also listening to a lot of contemporary Cuban music, mainly springing from the *Buena Vista Social Club* (Buena Vista Social Club, 1997) project which was impeccably recorded by Nick Gold. All of these records presented a deep soundstage; the individual instruments were clear and detailed in the mix but there was also a tangible sense of the recording environment in the recordings. The listener is simultaneously sitting in the musician’s chair, the centre of the ensemble and at the back of the room. Information regarding the recording processes employed (despite the commercial success of many of the releases) was surprisingly hard to come by.

Books such as Howard Massey's 'Behind the Glass' (Massey, 2000) did much to illuminate the thought processes of many great engineers and producers but were too general to be of much practical use, comprising short interviews offering an overview of a subject's recording philosophy. There are lots of text books on the technical aspect of studio, home recording and large ensemble 'classical' recording, which offer excellent insight to general microphone principles and technique, but the most fruitful sources in my search for a way forward were photographic. A few, usually gatefold, records offered some tantalizing glimpses of recording sessions (the Miles Davis compilation '*Circle In The Round*' (Davis, *Circle In The Round*, 1979) for example) but Ashley Kahn's books '*A Love Supreme / The Creation of John Coltrane's Classic Album*' (Kahn, *A Love Supreme / The Creation of John Coltrane's Classic Album*, 2002) and '*Kind Of Blue: The Making of the Miles Davis Masterpiece*' (Kahn, *Kind Of Blue: The Making of the Miles Davis Masterpiece*, 2000) contained the most useful, albeit technically vague, information I could find at the time. The two albums in question sound dramatically different (both musically and in terms of capture / presentation) but the photographs of the sessions included in the books' central chapters were extremely illuminating as they were representative of a general working methodology regarding the artists relationship with the studios in use. Coltrane recorded the majority of his Impulse Records output at Van Gelder Studios (Englewood Cliffs, New Jersey) and Davis similarly recorded all of his Columbia Records works at the label's 30th Street Studios (Manhattan, New York).

Van Gelder Studio was purpose built by freelance engineer Rudy Van Gelder in 1959, prior to this he had recorded for and helped to define the sound of labels such as Blue Note, Impulse and Verve from his parents large living room in Hackensack. Dan Skea's *Rudy Van Gelder in Hackensack: Defining the Jazz Sound in the 1950's* (Skea, *Rudy Van Gelder in Hackensack: Defining the Jazz Sound in the 1950's*, 2002) reflects on this period of his work, including techniques taken forward to the Englewood Cliffs facility. Van Gelder Studio is large (around 100 metres sq) and acoustically lively, the floors were originally polished concrete, walls of cinder block and a high vaulted ceiling. Visitors commented that it felt like a small modern chapel (figures 1 and 2).

30th Street Studios (Figures 3 and 4) was acquired by Columbia Records in 1948, originally built in 1875 as a Presbyterian church. The single recording space was huge (the ceilings were reportedly 30 metres high). As well as Davis' output 30th Street was used to record everything from full symphony and show orchestras to Bob Dylan's extremely sparse *The Freewheelin'* (Dylan, 1963) and Pink Floyd's *The Wall* (Floyd, 1979).

The images I found showed similar technical practice in terms of microphone choice and placement. The musicians were arranged largely 'in the round' with clear lines of sight between them and the microphones were placed close to the instruments. As Skea notes

The Telefunken was originally designed to be used as microphones had been up to this time: with a single microphone placed at a significant distance from an orchestra. But Van Gelder, seeking an immediacy more conducive to the recording of small group jazz, adapted the Telefunken to his own purposes, using multiple microphones and placing them closer to the individual instruments (Skea, Rudy Van Gelder in *Hackensack: Defining the Jazz Sound in the 1950's*, 2001)

There were some surprises in the photographs I found, it seemed to have become understood amongst the players I was working with that when recording 'classic' jazz 'they didn't use baffles', this clearly was not the case when looking at images from 30th St. Van Gelder Studio did appear to employ this practice though, and the results were audible.



Figure 1: Bill Evans Trio – Van Gelder Studio 1965



Figure 2: Outside Van Gelder Studio

The Van Gelder recordings can be characterized thus: There is a clearly audible reverberation, but it is short (sub one second) and rich in middle frequencies. It is a 'hard' reverberation (the reflections are not particularly complex / diffuse), this is attributable to the architectural characteristics of the recording environment (concrete floors and cinder block walls). The reverberation is clear

in the mixes but not dominant, it hangs 'behind' the instrumental focus points of the mix due to the physical size of the space. The instruments are presented almost from the players' perspective (they are clear and dry), perhaps with the exception of the bass (a problematic instrument, more on this later). Although the recordings made at Van Gelder Studios do of course differ sonically from album to album, the studio's output is an interesting case study as Van Gelder was the sole main engineer.



Figure 3: Kind of Blue recording session, 1959



Figure 4: Outside CBS 30th St Studio

The CBS 30th St Studio's sound in the context of jazz is harder to characterize as there were a multitude of staff engineers and the studio itself (due to its size) offered greater sonic possibilities. In addition to the huge main recording space engineers employed an echo chamber, which was 'tuned' to suit each session (a process of repositioning speakers and microphones to change the characteristic of the reverberation in the space). The images of Miles Davis' celebrated *Kind of Blue* sessions showed extensive use of baffles but the musicians were close to each other, with clear sight lines, and nobody wore headphones. The baffles seem to have been placed to minimise the sound of the large space in the close instrumental microphone, rather than to separate the musician's microphones from each other, as seen in figure 3. The reverberation heard on *Kind of Blue* is significantly longer than that audible on Coltrane or *A Love Supreme* (Coltrane J. , *A Love Supreme*, 1965) but again, the instruments are captured relatively closely, more so than a classical or big band recording of the time or indeed earlier Miles Davis albums made in the studio such as *Miles Ahead* (Davis, *Miles Ahead*, 1957).

Recordings made in the 50s and 60s have come to define the aesthetic of recorded jazz in many respects, but I felt that there were problems in many of the recordings of the era which I would try to avoid.

The way in which engineers of the era dealt with the soundstage often strikes me as a little odd; there was mixed practice (particularly on earlier releases) regarding the use of panning, in no small part due to the limited functionality of many early mixing consoles which only offered the option of hard left, centre or right panning. In the period since I made these recordings a great deal of technical information and photographic content has now been assembled in the Steve Hoffman Music Forums blog (<http://forums.stevehoffman.tv/threads/history-of-cbs-records-30th-street-studio-nyc-many-pictures.388186/page-44>), allowing the contemporary engineer to access much more information relating to these historic recording processes than was readily available to me at the time.

The use of 'hard panning' sometimes results in a rather disassociated soundstage. Whilst it is a wonderful recording, Thelonious Monk's *Underground* (Monk, 1967) presents a rather stark soundstage; the drums and bass are forced hard left and right respectively to enable the piano to take centre stage, but the lack of ambience in the recording results in a presentation which to me doesn't quite feel 'glued together' in some listening situations (over widely positioned speakers or headphones for example). This is in no small part down to stereo mixes often being something of an after-thought in the mix process, as observed by Dockwray and Moore.

During most of the mid to late 1960s, stereo mixes of albums were considered to be a minor adjunct to the dominant mono version. Mono was considered to be the only significant format, a notion supported by the fact that most pop music was played back on mono equipment in the home (Dockwray and Moore, 2010).

In recordings from the era the bass is often rather quieter and lacking in low frequency definition than we might perhaps expect at present (I will address this in more depth in the analysis of my own recordings). As amplification of the

instrument at the time was not commonplace it is perhaps understandable that there are many recordings where the bass is 'allowed' to become obscured by the drums and piano at points, as this accurately represents the acoustic balance of the ensemble. To add a feeling of further disappointment to bass players, there were technological limitations to consider. Most consumer 'home' playback systems of the time had nothing like the frequency range which we expect to experience now (particularly in terms of low end extension) and although vinyl cutting had reached a point of extremely high fidelity there was always the risk that uncompressed (or very lightly compressed, as was the norm at the time) low frequency information might make a listener's stylus jump out of the records groove, particularly when the instrument was panned at the extreme edges of the soundstage.

The *Kind Of Blue* stereo mixes function very well in my opinion, falling somewhere between Dockwray and Moore's Triangular and Diagonal classifications. Although the piano and Drums are hard panned the bass and trumpet occupy the centre of the sound-stage. The amount of 'room' in the recording as a result of the inevitable 'bleed' between the instruments microphone positions also helps to create a more integrated soundstage. It was this arrangement (with refinements afforded by contemporary technology) which I would choose as a starting point on all subsequent recordings I made for Gondwana records.

Preparation and Formative Recordings

I began to research recording spaces I could gain access to which might offer similar sonic possibilities to these benchmark studios. It was quickly obvious that the answer would not be a purpose-built studio, for many reasons.

We had a very small budget, Matt was self-financing the recording with no label backing at the time. Established facilities in Manchester (there was no budget for travel) which might have suited the sessions such as BBC Studio 6 were prohibitively expensive. It seemed obvious to me that we would have to work

with on location recording equipment, but the commercial hire of large spaces was also too expensive. We looked in to using St Phillips Church in Salford (where I had recorded some live small ensemble jazz before) and although they were helpful we were unable to afford the amount of time we felt we needed.

Eventually two spaces in the University became viable; Peel Hall on the main campus and The Band Room (which was under the jurisdiction of music department) in the Adelphi Building. Following some speculative live recordings of Matt's ensemble which I made in Matt and Phreds jazz club in central Manchester we embarked on recording Matt's first album in the Band Room in August 2007.

The Band Room (figure 5) is an interesting space in the far corner of the 1915 built Adelphi Building on Peru St Salford. Originally a machine room, it is a double height space (10 metres) with a more recent suspended polystyrene tile ceiling at 6m. The floor is painted concrete and the walls are painted brick. It is a very lively space but the reverberation time is not huge, the suspended ceiling does much to reduce it. The room has natural light (something of a luxury) and although there is some external noise from the outside world this was tolerable if we worked on weekends, late in the evening or in the quieter summer period. Although not particularly pretty the space was conducive to a successful acoustic performance, natural light helped sustain long sessions and the room was acoustically supportive, it needed further work but I had found somewhere acoustically akin to Van Gelder Studios. I spent a lot of time in the Band Room thinking about how I might arrange the musicians in the space to garner the best results and, as I was able to play them a little, I experimented with the position of the drum kit and the piano. I walked around the space whilst playing a snare drum and noticed that particular positions encouraged clearly audible 'flutter echoes' which would be problematic. I rigged up some heavy drapes at points on the large (long unbroken) brick wall opposing the windows and was able to 'tune' the reverberation to a degree. The building was full of old thick office dividers at the time, they made very good baffles, offering a good deal more isolation than many commercially available alternatives. These were summarily 'borrowed' and put to use. Through the use of the baffles and drapes

I began to feel that we could achieve what we were looking for; a close, detailed reproduction of the instruments with an audible supportive reverberation. As mentioned, the space had no installed audio recording equipment so I used a combination of my own equipment and borrowed what I could from the university and friends.



Figure 5: *The Band Room 2009*

The system I used for these first sessions was basic. At the time, I did not trust running a laptop as a primary recording device. Although this was technically feasible I simply did not have the available money to invest in equipment which would be up to standard, both in terms of recording quality and system stability. I had picked up a used Tascam DA88 which I had employed previously on some on location choral recordings. Although the equipment was a little outdated it was stable and had been regarded as very high quality ‘broadcast standard’ technology. The limitations of 8 track recording were obvious but given this track-count was more than double that afforded in 1959 (and employed on *Kind of Blue*) I felt that I should be able to make it work. I had also recently purchased a Mackie Onyx 1640 mixing console. Although cheap by professional standards the board had good pre-amps, equalization and had four sub groups, which would become essential in the production of the subsequent recordings (the drums for example were sub-mixed down to two channels from a coincident pair of overheads with bass and snare drum spot microphones).

By this point in my career I had an appreciation of perceivable differences between professional quality and lower quality equipment. I was lucky I feel to 'come through' in a time where sonically impressive microphone technology became much more affordable. Companies such as Oktava, Rode, and SE Electronics were producing microphones which many felt competed with the more commonly accepted 'industry standard' models from Europe and the USA in terms of sonic performance. The technical specifications (in terms of noise floor and sensitivity) of some of these microphones did not meet the benchmarks set by Schoeps, AKG or Neumann for example and the build quality of some of the Oktava offerings (rumoured to be made from melted down Soviet tanks) was questionable, but they were capable – with experimentation – of producing good results.

These first sessions resulted in the album *Sending My Love* (Halsall, *Sending My Love*, 2008) (not included for consideration in this thesis), the album was well received and in particular garnered a good deal of support from BBC Radio 1 Worldwide's Gilles Peterson.

A real pleasant surprise of the last few weeks of picking up music. A beautiful 5-track album...you know I'm always happy when I can find some new jazz, something fresh, new players, new generations, holding the flame, keeping it alight...new music from Matthew Halsall from Manchester, album called *Sending My Love*... (Peterson)

This vote of confidence was really important to Matt and he was subsequently invited to Maida Vale to record a string of live sessions for Peterson's show.

The majority of the record featured John Thorne on bass, Gaz Hughes on drums, Adam Fairhall on piano and Roger Wickham on flute and saxophone. Following Roger's relocation to Spain and John's lack of availability, Matt brought in Nat Birchall on saxophone and Gavin Barras on bass for one final session. The album's final track *Satchi* was recorded by this line up, which then

stayed constant through the majority of the next five releases on Gondwana Records.

I view *Sending My Love* as an interesting, if not entirely successful, record. The capture I achieved certainly 'felt' like a jazz record but I struggled with certain aspects of the recording and mixing process. The louder tracks presented real difficulties in terms of separation and there are moments on the record where there is practically none of Matt's trumpet microphone in the mix, as the instrument spilled on to practically every other microphone in the room. Matt wanted the bass to be loud and 'phat', referencing the early 90s Hip hop records he drew influence from. Again, this was problematic as achieving separation from the drums (which would allow me to place the bass at the front of the soundstage) was extremely difficult in the louder sections of arrangements. The tracks with less dynamic variation however, and particularly those using brushes on the kit, were relatively easy to put together, *Satchi* being my personal favourite from a sonic perspective. Although at points we struggled to find balance in the mixes we got there in the end and (as noted above) the record was very well received.

Following a tour of the album we reconvened (with the same personnel used on *Satchi*) in November 2008 to begin work on Nat Birchall's first album for Gondwana in Peel Hall.

Nat had been a fixture on Manchester's jazz scene since the 1990s and was recommended to Matt as a potential replacement sideman for Roger Wickham. It was clear from early sessions that Nat was a great player, that he shared similar influences (in terms of jazz) to Matt and we all got on well, both musically and personally. Nat had been writing material consistently through his career (his self-released *The Sixth Sense* had received high praise in 1999) and Matt felt that he could begin to expand the Gondwana roster with Nat's solo material.

Output 1: Nat Birchall – *Akhenaten* (2009)

(Birchall, 2009)



Figure 6: Nat Birchall *Akhenaten* - front cover

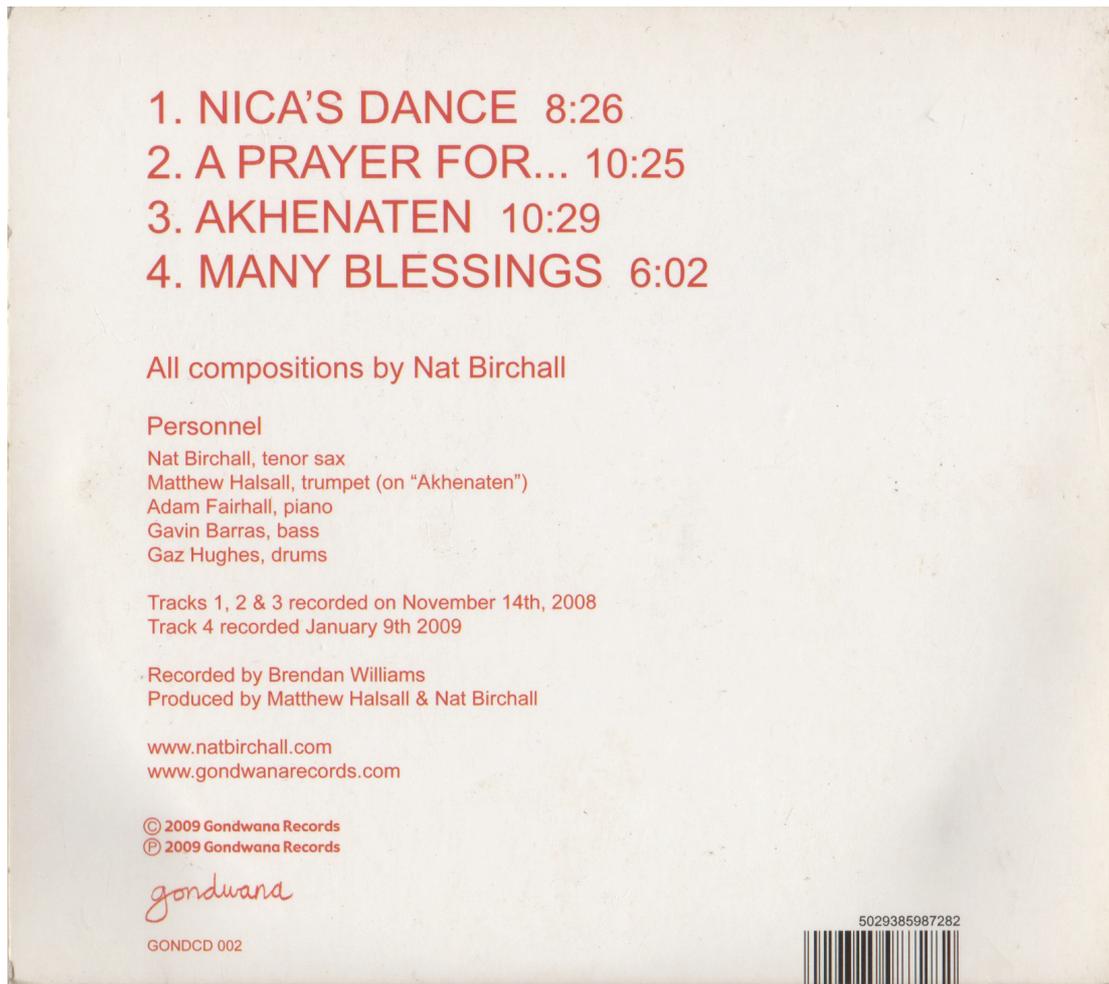


Figure 7: Nat Birchall Akhenaten - back cover



Figure 8: Akhenaten Recording Session – Peel Hall 2009

Peel Hall (located in The University of Salford's Peel Building) was constructed in 1896 and seats around 300 people. The reverberation time is long, but unusual in that the high frequency tail is noticeably shorter than that of the mid / low frequencies (Figure 9), this results in a 'warm' reverberation, it is not 'splashy' (prevalent in near reflections and high frequency content).

Hz 1/3 oct	T30	EDT
100	1,7	2,58
125	1,55	2,3
160	1,48	2,54
200	1,68	1,55
250	1,56	1,51
315	1,57	1,61
400	1,49	1,65
500	1,45	1,75
630	1,52	1,65
800	1,54	1,74
1000	1,58	1,62
1250	1,5	1,76
1600	1,44	1,84
2000	1,45	1,6
2500	1,39	1,54
3150	1,35	1,54
4000	1,24	1,35

Figure 9: T30 and EDT Measurements of Peel Hall's reverberation characteristics - Measurements carried out by Krasimir Yonchev

There is no literature to suggest that design was conceived to cater for particular ensembles but the hall has a long history of brass band performance. I find that unless one sits very close to the ensemble, brass bands can sound rather muddy in the hall; the focus of the ensemble falls primarily in the middle of the frequency spectrum and sometimes the low / lower middle focussed reverberation can obscure instrumental detail at high performance dynamics. Fortunately, the reverberation does suit small ensembles; drums sound particularly good as the high frequency information generated by cymbals and

snare drums does not become overly obscured by the reverberation. The ceiling in the hall is very high at the stage level (9.35 metres) and the hall is also very wide (15.23 metres). As a result, the reverberation on stage is very diffuse (by virtue of the complex architectural details) and recordings of quiet performances can sound extremely intimate (lacking both near and far reflections) as very little reverberation returns to close instrumental microphones. These characteristics have obvious similarities to that of Columbia's 30th St Studios and I drew from photographic materials previously mentioned when considering how the ensemble might arrange themselves in the space to achieve satisfactory instrumental separation and a successful self-balance, with little reliance on headphones.

Recording Equipment

By this point I was using a location recording rig that I was technically happy with, centred around a Mackie Onyx 1640 in which I had installed a digital card enabling 16 channels of DA over Firewire 400. I was using a 2007 MacBook and tracking to an external Firewire hard drive at 44.1KHz – 24bit. I did experiment with higher sampling rates but decided that any qualitative difference (which I did not hear) was outweighed by the increase in file sizes / transfer speeds and CPU implications. I have continued to work at 44.1KHz / 24bit throughout the majority of my professional career, regardless of a technological march towards 'super high sample rate' recording. The link below discusses some of the misconceptions surrounding digital audio recording.

http://people.xiph.org/~xiphmont/demo/neil-young.html#toc_1ch (Monty, 2012)



Figure 10: Recording Equipment - Peel Hall 2009

In terms of on-location monitoring I would work between a pair of active Event 20/20 monitors (on which I would reference test recordings) and extremely isolated Beyerdynamic DT 300 headphones which I would listen to throughout takes, as I had in the Band Room.

This recording system was stable (there were no 'in take' hangs or crashes) and vitally, as I would again sit in the same space as the musicians, it was also physically quiet. Laptop fan or hard drive noise could have easily compromised the recordings. Although the Mackie 1640 was not regarded as a 'professional' desk I was very happy with the pre-amps. Subsequently I have continued to use the desk alongside my own Audient asp 8024 and external pre-amps such as CAPI VP26s, which are many times the price. The 1640 pre-amps always sound good to my ears; they are not colourful but have plenty of gain and I've never felt that they are at all brittle in the high-end capture. In 2016 the Matthew Halsall album *On The Go* (Halsall, *On The Go*, 2011) was remixed and re-mastered for a limited edition 180gm vinyl run, the engineer commented on the quality of the recordings (which he mixed at Manchester's 80Hz on a Neve

Genesis, with Westlake monitoring). When I recounted the recording equipment I had used he was somewhat surprised that this relatively inexpensive equipment had captured such respectable results.

Arranging the Recording Space

As was the case when working in the Band Room I chose to sit in the hall with the musicians. The amount of time it took to make test recordings (for review on monitors) was outweighed by the time I saved when having to make changes to microphone positions. I also wanted to keep my cable runs short as I did not have access to a multicore stage box which was qualitatively of a high enough specification. Being so close to the musicians meant that I felt really engaged in the process, almost like a member of the band. I could listen acoustically to the instruments and then listen to my headphones / monitors very quickly to judge capture. If a band member needed something physically altering, then I could do it immediately. A similar methodology is discussed in Tape Op issue 49 by the engineer producer Ethan Johns (Crane, 2005).

How do you get sounds, though? How do you know what's happening with the drums if they're playing right here and you're over at the console?

You record something and play it back. I think at this point I've recorded enough kits to know — to get pretty close on the first shot about what microphone I need to put where to get the result that I want to get. The recording process for me, I like it to be as invisible as possible, where often if a band comes in here and we start at eleven, we're listening to takes before lunch and we're listening to everybody. I'm not the kind of guy that will spend the first day or two getting the drum sound. We'll usually have a master by dinner. It's been a long time since I haven't achieved a master take on the first day. We'll be recording before anybody really knows that we're recording, everyone will come in it'll be just a very natural process and everyone is

comfortable and all of a sudden, "Hey, guys, come check this out, that was really cool." (Johns, 2005)

Johns' description of his own recording process resonated with my own; I would work holistically on the ensemble capture whilst the band were rehearsing (rather than focussing on a particular isolated performer), attempting to be as unobtrusive as possible whilst moving microphones, arranging baffles and monitoring the results. I would set up the bulk of the recording equipment either the night before, or early on the morning of the sessions so as to avoid disruption of the performance space whilst the band carved out their own places in the acoustic response of the hall and the compositions at hand.

I had learned a good deal about how the physical positioning of players in a space could affect both phase correlation and clarity through my experiences of recording in the Band Room. I kept the musicians close together in Peel Hall, relying on some light baffling and directional microphones to achieve separation, as illustrated in figures 8 and 10. It became immediately apparent that there would be noticeable spill between the instruments in the hall (as expected) but this spill was not, due to the lack of close reflections, unpleasant. The hall's reverberation was so diffuse that the spill helped to 'glue' the close microphones together, with little unpleasant off-axis colouration.

I considered the final presentation of the stereo image from the beginning of the recording process. I knew that setting up the band 'as live' would not result in the most effective physical arrangement, both sonically (in terms of the implications for recording) and in terms of inter-band line of sight / sound. With some of the 'problematic' stereo presentation I have mentioned in mind – regarding recordings of similar ensembles from the 50s / 60s – I would not opt solely for hard panned instrumental arrangement, but an image which integrated the instruments across the stereo field; presenting an intimate sonic perspective which was part audience member, part performer.

The performers were arranged on stage in the round with the drums against the large curtain to help soak up a little high frequency information, which might obscure clarity particularly in the piano and bass capture.

A small bass amplifier was placed between the drums and piano, primarily to help the performers self-balance, but this also mirrored the final stereo presentation to a degree. Imagine a line drawn from the bass amplifier to the horns, this axis forms the centre of the stereo field (figure 11).

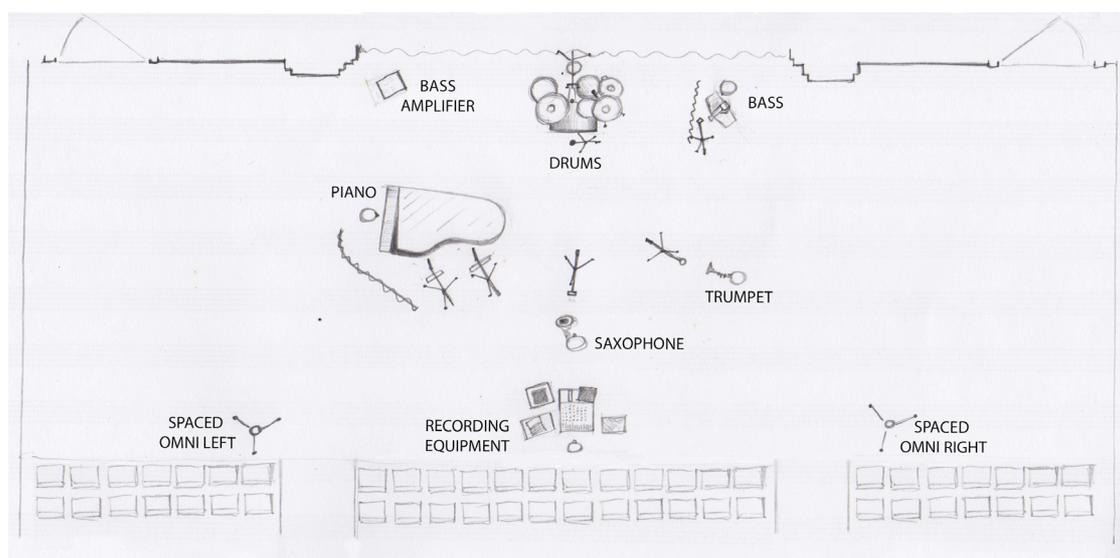


Figure 11: Actual arrangement of musicians on stage

The stereo image in the final mix with regards to drums and piano was actually reversed. If I had stuck physically (in terms of the performers' position in the hall) to the indented mix panning position, then the drums and piano in particular would have been too close to the reflective walls of the hall (resulting in possible issues with close reflection spill into adjacent microphones) and the drums would have been too far away from the curtain to take advantage of its absorbent qualities (Figure 12). I was mindful that a greater physical distance between the drums and piano would increase the potential for problematic time delays between the microphones capturing the instruments, which had been an issue on earlier recordings. This arrangement would also have compromised line of sight. One could argue that I should have moved the room microphones to mirror the final mix positions, but despite the proximity of these microphones

to the ensemble (equally spaced, around 7 metres away from the centred drum kit) they actually provided surprisingly little in the way of positional time cues, the hall's reverberation was so diffuse that they became negligible.

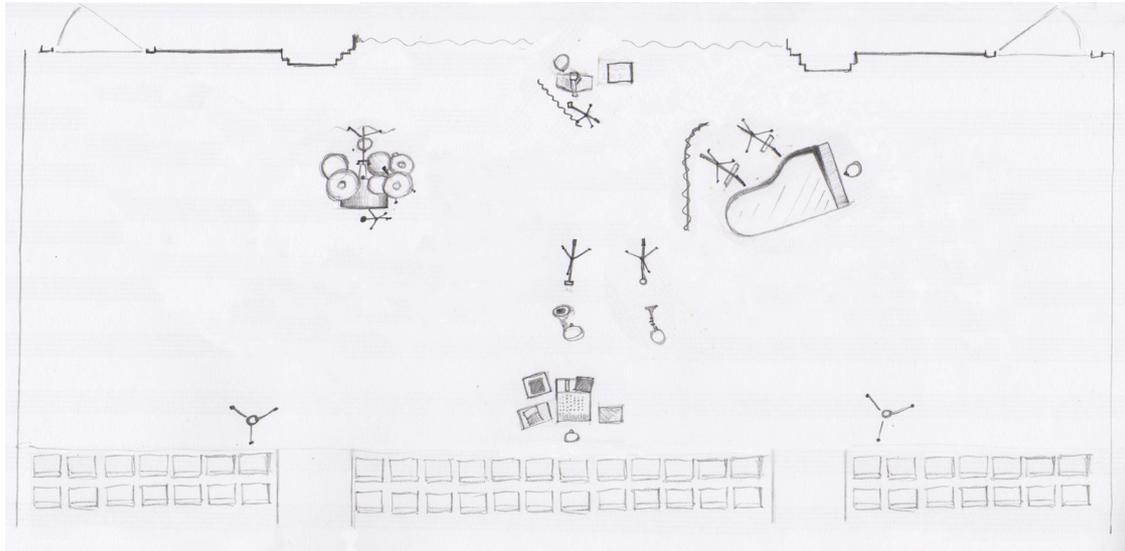


Figure 12: Arrangement of the instrumentation in the mix – Drums and piano are too close to reflective surfaces and line of sight is compromised.

After the initial instrumental set up, positioning of the players and cabling / desk arrangement (figure 13) the ensemble began to run through the material to be recorded (little of which they had seen before). We had discussed keeping the use of headphones to an absolute minimum (as we had done in the Band Room) but something about the space left both Adam (piano) and Gaz (drums) feeling slightly disassociated from the rest of the ensemble, both of them felt that they need to hear a little more piano in order to 'bounce' off each other's playing effectively (Gaz stating that his own instrument was acoustically too loud and Adam that his own was not loud enough). I had brought along headphones and an amplifier with this potential problem in mind, so both of them wore headphones (with 'one ear off' on takes) in order to still hear the 'natural' sound of the ensemble in the room. I felt that dogmatic adherence to my aforementioned criteria would be potentially damaging to the performance, and when the headphones were set up both players became more confident in their performances.

Microphone Technique

Instrument	Microphone	Polar Pattern	Position / Configuration
Bass Drum	Groove Tubes GT57	Cardioid	15 cm outside
Snare Drum	AKG c414	Cardioid	15 cm above
Overhead L	Oktava 012	Cardioid	Spaced A/B - 80cm above snare / hi hats
Overhead R	Oktava 012	Cardioid	Spaced A/B - 80cm above ride / floor tom
Bass 1	Sennheiser md421	Hyper-Cardioid	Inside bridge
Bass 2	Groove Tubes GT57	Cardioid	30cm from bridge
Piano 1	Oktava 012	Omnidirectional	Spaced A/B - 50cm from low string bed
Piano 2	Oktava 012	Omnidirectional	Spaced A/B - 50cm from low string bed
Trumpet	BLUE Baby Bottle	Cardioid	50 cm facing 30 degrees down to bell
Saxophone	AKG c414 bXLS	Hyper-Cardioid	50cm – facing bell / lower tone holes
Room 1	SE Electronics Titan	Omnidirectional	Spaced - Circa 6m from drum kit
Room 2	SE Electronics Titan	Omnidirectional	Spaced - Circa 6m from drum kit



Figure 13: Mixing Desk - Channel arrangement

Piano

The Yamaha C3 piano was positioned so that the open lid, on full stick, faced the drum kit (figures 14 and 8). Working with a grand piano in this context (I had worked with the same instrument in smaller classical configurations before) was something of a revelation; the separation from the direct sound of the drum kit (using spaced omnidirectional Oktava 012s, focussed on the low and high sections of the frame) was very good from the first test recordings. I also added an improvised baffle built from a light office divider and a large heavy velvet throw which helped to further tame some reflected high frequency spill from the other instrumentation. I added some blocks of foam behind the microphone capsules to achieve further separation (figure 14). Whilst this practice is known to subtly alter polar patterns it worked effectively in this context. Great care was taken to retain line of sight for Adam in order to allow for clear communication in improvised passages of the arrangement. He could see Gavin, Nat and Matt through the open lid of the instrument and Gaz to his left.

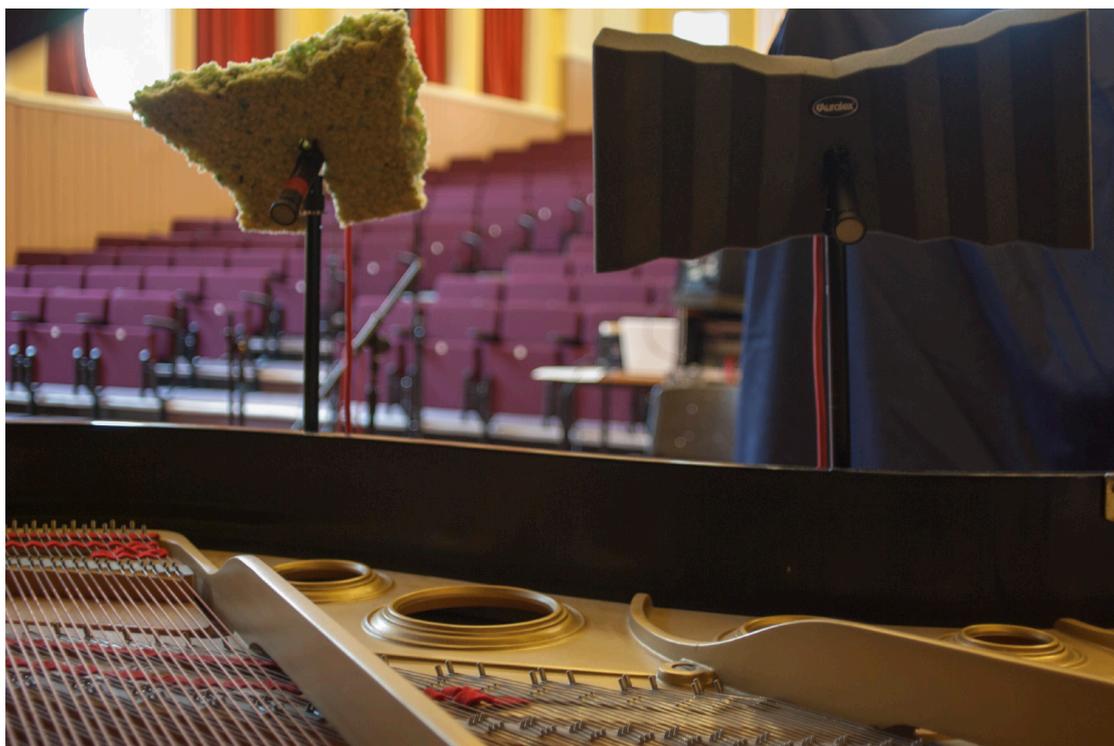


Figure 14: Piano Microphones

Drum kit

Having been generally happy with the results, I used similar microphones on the drum kit (figures 15 and 16) as I had done on earlier sessions in the Band Room: a coincident pair of small diaphragm cardioid condensers on the top of the kit (Oktava 012); a small diaphragm cardioid condenser on the snare drum (AKG c451) and a large diaphragm cardioid condenser on the bass drum (Groove Tubes GT57). The coincident pair resulted in a relatively narrow stereo image (tighter than that of ORTF or NOS for example), but this worked well in terms of the intended mix panning position; I knew that I would not be panning the overheads hard left and right as this would not have been representative of the intended on stage image I sought. Coincident techniques allow for the narrowing of the stereo image more successfully than that of ORTF or NOS as there are almost no timing differences between the two capsules, resulting in fewer audible phase shifts such as a dulling of high frequency information. Oktava 012s are often seen as a ‘poor engineers’ Neumann km184, but I find they have a different character. They are perhaps just a little brighter in the extreme high end, but most notably there is something slightly ‘fluffy’ about the high frequency capture. This is a linguistically terrible descriptor I know, but

many fellow practitioners will arrive at a similarly vague summarisation. Modern Schoeps and Neumann small diaphragm condensers are measurably more accurate but sometimes this accuracy (on the top of a drum kit in particular) can be something of a hindrance. The 012s slight inaccuracy / distortion in high frequency capture serves to very subtly blur upper middle / high frequency detail, which might be described as 'cold' or 'clinical' by some listeners. This is also true of some of the valve (and to a more extreme extent ribbon) microphones from the 50s / 60s which were used on the reference material we often discussed.



Figure 15: Drum microphone placement 1



Figure 16: Drum microphone placement 2

Bass

The upright bass again proved to be one of the most challenging instruments to record. In my experience the instrument rarely self-balances effectively in the context of an acoustic jazz ensemble unless the drummer is using brushes (or playing with sticks very quietly) and the front-line instruments reduce their dynamic to suit. It seems that this is a longstanding problem; I had seen photographs and film footage (particularly from live performances) of dynamic microphones mounted in the bridge of the instrument. I was also aware that Rudy Van Gelder was rumoured to have used a close dynamic microphone on the upright bass, which he fed into an amplifier / speaker in a separate room and recorded with a large diaphragm condenser.

The instrument's tonality in a mix is also something of a puzzle; through the 90s the instrument was to some degree redefined by its sampled prominence in Hip hop. Many tracks of this era feature samples of jazz / soul ensembles which were heavily equalised to boost low frequencies, repositioning the bass to align with additional (often heavily compressed) sampled percussive material. Gang Starr's *Robin Hood Theory* (Gang Starr, 1998), which prominently samples George Duke's *Capricorn* (Duke, 1973) and Tribe Called Quest's *Electric Relaxation* (Tribe Called Quest, 1993), sampling Ronnie Foster's *Mystic Brew* (Foster, 1972) provide examples of this common practice.

When standing a metre or so away from the acoustic instrument one is certainly aware that it can produce very low fundamental frequencies, but these are not – even when played by the most proficient performers – earth shatteringly loud. The use of directional large diaphragm condenser microphones in close proximity to the instrument (common from the late 50s onwards) enables a capture and reproduction of the upright bass which perhaps more closely represents the physicality of playing the instrument, rather than the experience of the acoustic listener. In much early 90s Hip hop these low frequencies had been further emphasized, causing the contemporary engineer something of a problem in terms of audience expectation. By the time I was making *Akhenaten*

I was very much aware of the need to balance everyone's expectations and opted to use a double microphone technique (figure 17).

A Sennheiser MD 421 was mounted in the bridge of the instrument (with no high pass filter applied) and a large diaphragm condenser was placed around 30cm away, facing the bridge and slightly offset to the right. The large diaphragm condenser was much more accurate, requiring only a small amount of equalization, but more susceptible to bleed from the drums in particular. The dynamic microphone required a good deal of equalization to sound natural but in the denser sections of performances it offered much more upper-middle frequency detail with less problematic spill, due to its close proximity to the instrument and directional characteristics. On the record – and I would hope that this is not audible - the large diaphragm microphone is always used in the bass led introductions, then a re-balancing of the microphones in the mix is made when and if the dynamic (and potential for unwanted spill) picks up.

Another light baffle was arranged between the bass and drum kit using a heavy throw draped over a microphone stand, to further attenuate high frequency spill.

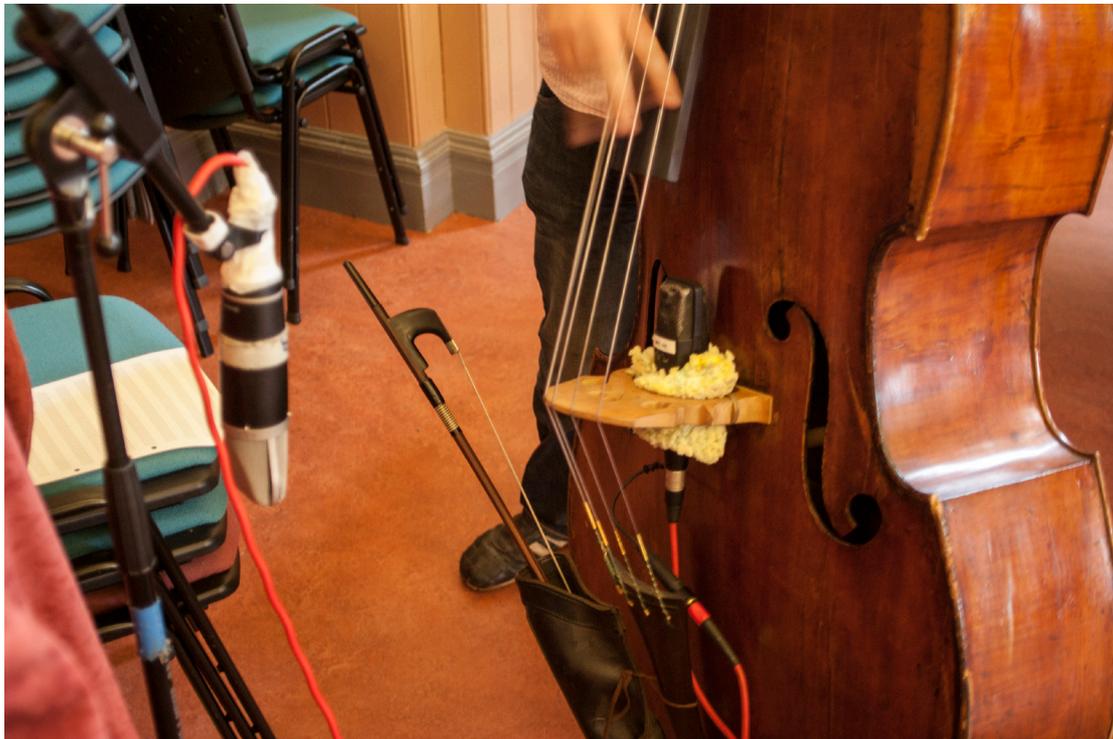


Figure 17: Bass microphone placement

Saxophone

A single large diaphragm cardioid condenser microphone (AKG C414b XLS) was used to record Nat's instrument (figure 18). I had experimented with different models prior to this recording (Rode NTKs, GT 67s etc.) and found the tonal differences were not as extreme as I might have imagined. The 414 was the flattest microphone I could find at the time and the lack of high frequency boost (present on a lot of large diaphragm condensers) was useful. By far the most important consideration was the placement of the microphone in relation to the bell and lower tone holes of the instrument (and of course general distance). Nat was a slightly difficult customer, he has a great love of John Coltrane and often adopted his microphone positioning (the bell positioned directly onto the microphone). I preferred to position the microphone slightly to the left (audience perspective) of the bell in order to tame some of the aggressive high frequencies (which can emanate from the bell) and achieve a little more clarity from the lower tone holes. Nat moved a lot whilst playing and often returned to his preferred position, regardless of how it might have sounded. The separation of the instrument in the large space was excellent due to the lack of near reflections and no baffling was necessary.



Figure 18: Saxophone microphone placement

Trumpet

Matt took a solo on the title track of the album, spill was again not a big issue, the rear of the cardioid BLUE Baby Bottle was positioned to face the drum kit and the microphone looked down towards the bell of the instrument at an angle of circa 30 degrees (figure 20). The BLUE microphone has an unusual frequency response (figure 19) in that it emphasises lower middle frequency information and subtly rolls off the high end.

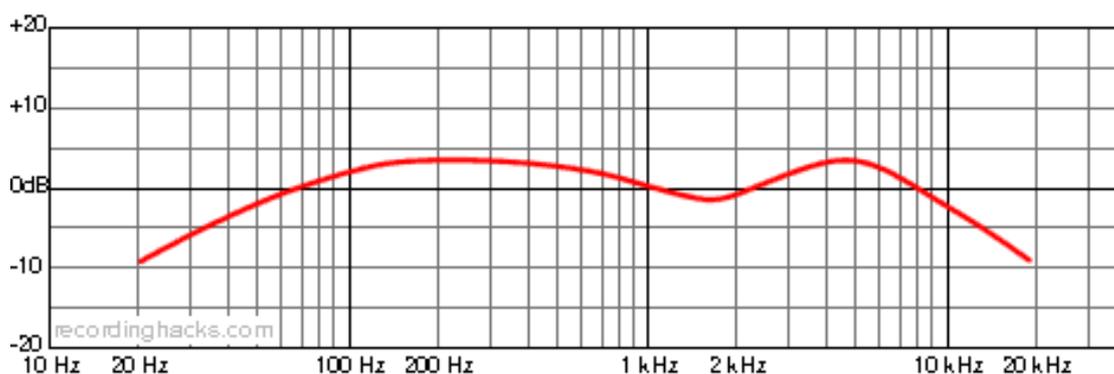


Figure 19: BLUE Baby Bottle microphone - frequency response

Whilst this microphone doesn't work in every application I found it very useful when working with the trumpet. The trumpet (and indeed most brass instruments) are interesting in that the performer is effectively positioned behind the loudest part of the instrument (the bell). Experience had shown me that trumpet players can be somewhat alarmed by the sound of their instrument if the microphone is positioned directly in front of the bell, as the high frequency information is so much more prominent compared to sound experienced from their own playing position. The BLUE microphone helped to create a warmer tone, satisfying to both myself and Matt. Its rear rejection was excellent (without troublesome off-axis frequency issues) and I've continued to use this microphone as my initial choice on trumpet to this day, even when much more expensive options are available.



Figure 20: Trumpet microphone placement



Figure 21: Marking the players' positions

In order to retain consistent microphone positions through the day of recording I taped foot (and bass spike) positions for Nat, Gavin and Matt (Figure 21).

This session produced three of the four tracks which made the final cut of *Akhenaten*, a fourth (Many Blessings) being added from a session in the Band Room the following January. Spirits were high; there was a sense that we had played and captured this material (which was undoubtedly indebted to music of the 50s / 60s) in a space which both supported and inspired the performers, using recording techniques which did not present a barrier between expression and capture. I had successfully created an environment where the musicians felt comfortable, and to avoid 'red light syndrome' I made little differentiation between recording and rehearsing the material (recording almost everything from the day). I made a quick balance of the sessions, which I burned to a CD, in order for myself, Nat and Matt to consider which takes might be the 'best' ahead of mixing the album.

Mixing and Mastering

This was the first Gondwana record which I had recorded directly to hard disk and I was so pleased with the results that little processing beyond subtle equalization, very subtle compression and volume movements was required in the mix. With this in mind (and budgets at practically zero) I decided to mix the album in Logic 8, using no plug-ins beyond those included in the standard software. The aim of the recording had been to accurately present live performances by the ensemble with no overdubs in such a way that the material 'stood up' against recordings made in the 60s both technically and aesthetically and this presented both a conceptual and technical circle to square.

I had an understanding of the equipment which would be used in this era; from photographs I could see that the microphones were largely valve based condensers (as the technology of the era predated transistors), the microphone pre-amplifiers and recording consoles were also valve based, as were the electronics in the analogue tape machines used to record. This signal path - through Mylar diaphragms, valves, discrete electronics and magnetic oxide - obviously changes the state of an acoustic sound, and the technical aims of engineers throughout history were that this 'change' should be as imperceptible as possible to the listener. But this historic signal path introduces subtle

distortion and compression which some listeners feel has had a part to play in defining the aesthetics of recorded jazz, and there was not a valve or shred of tape in my own signal chain...

I did not worry much about this at the time. I knew the recordings met my own aesthetic criteria and felt strongly that it was my methodology (in terms of location, microphone positioning and arrangement of the performers in the recording space) which had resulted in a capture which sounded similar to our reference material, but there was a lingering inquisitiveness; what would it have sounded like if I had the same equipment as 30th St? But the fact was that I did not have access to that kind of equipment, so I just mixed the recordings to the best of my abilities and we were all happy, or just about. There was something different about my mixes however, they were slightly more detailed in the high frequencies and slightly less dense in the lower middle frequencies than much of our reference material. I tried equalizing the stereo mixes to 'match' reference material but the results were unsatisfactory, so I decided to experiment with analogue tape. The only machines I had free access to were those at the university, which – whilst thoroughly usable – were not designed for mastering. The Tascam (1 inch, 24 track) machines were unbalanced, employed Dolby noise reduction and – due to their age – went through periods of sounding a little worse for wear when they had not been serviced for a while (introducing wow and flutter and frequency misrepresentation through poor head alignment). Nevertheless, I recorded my two track mixes to two tracks of the machine (two tracks of a 24 track 1 inch machine is actually very similar technical fidelity as that of a consumer 1/8th of an inch cassette). I pushed recordings into and beyond the red LED's to see what results the tape saturation / compression might impart on the mixes. The results were not immediately startling (the more aggressively pushed recordings just sounded bloated and fizzy) but the subtly saturated transfers did sound more like our reference material and both Nat and I preferred them to the digital only versions. These transfers were imported to Logic's mastering software Wave Burner, in which I subtly equalized and limited the 'tape' mixes and attended to fades / lengths of silence between the tracks. I was not then (and am not now) a mastering engineer, but I was happy with the results, regardless of the rather 'budget' approach we had had to adopt for the

process. Nat, Matt and the band were happy too and the release was again well received by the press.

Reception

Following the release of Akhenaten Nat was asked to record a session at BBC Maida Vale but the touring commitments of the band prohibited this, so Nat enquired if I might be allowed to engineer the session, again from Peel Hall. The BBC came back with a positive response. It was great to see this music (which to some felt both 'out of time' and 'out of place') reaching wider audiences and being accepted into the canon.

The Independent – Phil Johnson

More spiritual jazz from Manchester. Saxophonist Birchall, who guested on trumpeter Matthew Halsall's recent Colour Yes for the same label, is strikingly impressive on his own, deeply Coltrane-fixated mini-album. Playing tenor throughout in a mid-to-late 'Tranequartet format, with Halsall adding trumpet on the title track, Birchall sounds amazingly soulful, each solo gathering intensity as it progresses. There's an endearing lack of tricksiness, with everything serving the spacey aesthetic of the overall project. (Johnson, Nat Birchall - Akhenaten, Review, 2009)

Output 2: Matthew Halsall – *Fletcher Moss Park*

(Halsall, Fletcher Moss Park, 2012)



Figure 22: Matthew Halsall - *Fletcher Moss Park*, front cover



Figure 23: Matthew Halsall - Fletcher Moss Park, back cover

From 2007 – 2013 I worked on nine studio albums for Gondwana Records. From the beginning of the relationship it became apparent to me that not all of the Matthew Halsall material we had recorded was being used on his subsequent releases. This is to be expected of course (not all the tracks from a session ‘make the cut’) but there was some really strong material that we had tracked in the Band Room and Peel Hall across various dates through 2007-2010, which had not yet been released. In 2011 Matt’s record *On The Go* (recorded in Peel Hall) won the ‘Best Jazz Album’ MOBO award, as a result offers of recording contracts from more established labels came Matt’s way and sales / concert fees picked up.

It is fair to say that prior to this development our relationship had become a little frayed around the edges. We had always found the recording sessions to be relatively straightforward and had been immediately happy with the quality of

the results, but we often clashed during the mixing process. These differences of opinion often arose over issues around how dynamics in the live performances influenced our ability to shape a mix. An ensemble's acoustic self-balance (when recording in a space like Peel Hall) effectively dictates the mix; as an engineer you cannot make radical changes to these inter-band dynamics (make very loudly played drums quiet in the mix for example) as the spill between microphones can result in undesirable 'smearing' of both detail and the stereo image. We had some fairly heated discussions whilst mixing *On The Go* and in the end Matt mixed some of the tracks himself. I was not particularly pleased with the results, but musically it was a good record when finished. I had however laid my cards on the table and said that I no longer wanted to work on mixes if we were going to disagree so much, things were left in a bit of a mess and I was not sure if Matt would be in touch again. But then we got the MOBO award and I suppose that the ego massage (for both of us) 'took the edge off' the situation a little. Subsequently the album also won the 2012 Gilles Peterson BBC Radio 1 Worldwide award for 'Best Jazz Album', adding further confusion to my own feelings about the mixes.

Matt (along with his manager Kerstan Mackness) had astutely decided to decline offers of contracts from other labels and instead opted to invest the small amount of profit they were accruing into establishing Gondwana Records as a more robust business. Matt did indeed want to work on more material, so we cleared the air and sat down to listen to three of the 'out-takes' previously mentioned. Matt felt that there was a common compositional thread linking these tracks, that they had not worked on previous releases individually, but en masse they made sense. We discussed more sessions (to complete this 'bricolage' record and begin work on a new one) and I voiced some concerns about recording in Peel Hall again. Although I loved working in the space (and still do) it was obvious that Matt often struggled with the inflexibility it presented at mixdown and I felt that it was important that we moved on. The hall was often only available late at night, or at weekends and there had been a succession of building works, which was making unexpected noise in the space an issue. More importantly it was essential to our relationship that I helped Matt to solve some of the issues we had encountered over the past couple of years. It was

my opinion that the root of the problem was one of compositional / arrangement indecision, but it was Matt's prerogative to keep options open and ultimately my role was to support him.

The technical methodology employed on these 'out-takes' was identical to that which I have discussed in the previous study (indeed Matt and Nat often shared recording sessions), I will therefore concentrate on a description of the recording process for the tracks which formed the rest of *Fletcher Moss Park*.

In July 2011 we recorded some entirely different material in the large wooden floored venue space Krakk, below the makeshift studio I now shared with the band Dutch Uncles in Manchester's Northern Quarter. The pieces were written for two violins, cello and double bass. We were both unsure of how these tracks might work in the context of a Matthew Halsall release but it was another clear sign that Matt wanted to develop his sound by moving away a little from the traditional quintet / sextet recordings he had previously released. The pieces were recorded simply and presented little technical difficulty, I had a good deal of experience working with string ensembles by this point and although we again relied on my modest microphone stock and location recording equipment, the results were technically good.

I arranged the performers in an unconventional way; centring the low frequency heavy instruments (bass and cello) and placing the two violins on the edges of the crescent (figure 24). This presentation would give a greater sense of continuity when alongside some of Matt's more traditional jazz pieces (if that was indeed the plan). When working with string quartets in a popular music context I often place the cello and viola in the centre of the ensemble as the 'right leaning' low frequencies of the cello (in its traditional physical position) often appear to me to be rather lopsided when co-existing with drums, bass guitars and voice etc. The edges of a 'pop' mix are often designed to be less dense, contextually this allows for more high frequency (i.e. violins) detail.

Microphone Technique

Instrument	Microphone	Polar Pattern	Position
Violin L	SE Electronics Titan	Cardioid	Circa 40cm
Bass	BLUE Baby Bottle	Cardioid	Circa 40cm
Cello	AKG c414 bXLS	Cardioid	Circa 40cm
Violin R	SE Electronics Titan	Cardioid	Circa 40cm
ORTF L	Oktava 012	Cardioid	Circa 2m
ORTF R	Oktava 012	Cardioid	Circa 2m
Flank L	Oktava 012	Omnidirectional	Circa 2m
Flank R	Oktava 012	Omnidirectional	Circa 2m



Figure 24: Recording in Krakk

Rough mixes of the best performances from the session were bounced and archived, we all felt very good about the session. Despite the unconventional recording space, the capture was detailed, accurate and free of extraneous noise.

Prior to this session I had recently been looking for a studio to record Dutch Uncles' forthcoming album for the label Memphis Industries, following the positive reception our previous release, *Cadenza* (Dutch Uncles, 2011), had received. I had visited a new studio built by George Atkins in the former Sharp Electronics factory in North Manchester, 80Hz. It was a technically impressive facility and although it was not appropriate for the Dutch Uncles project I felt that the large reverberant live room, coupled with a number of isolation booths (figure 25) could work very well for Matt's forthcoming sessions.

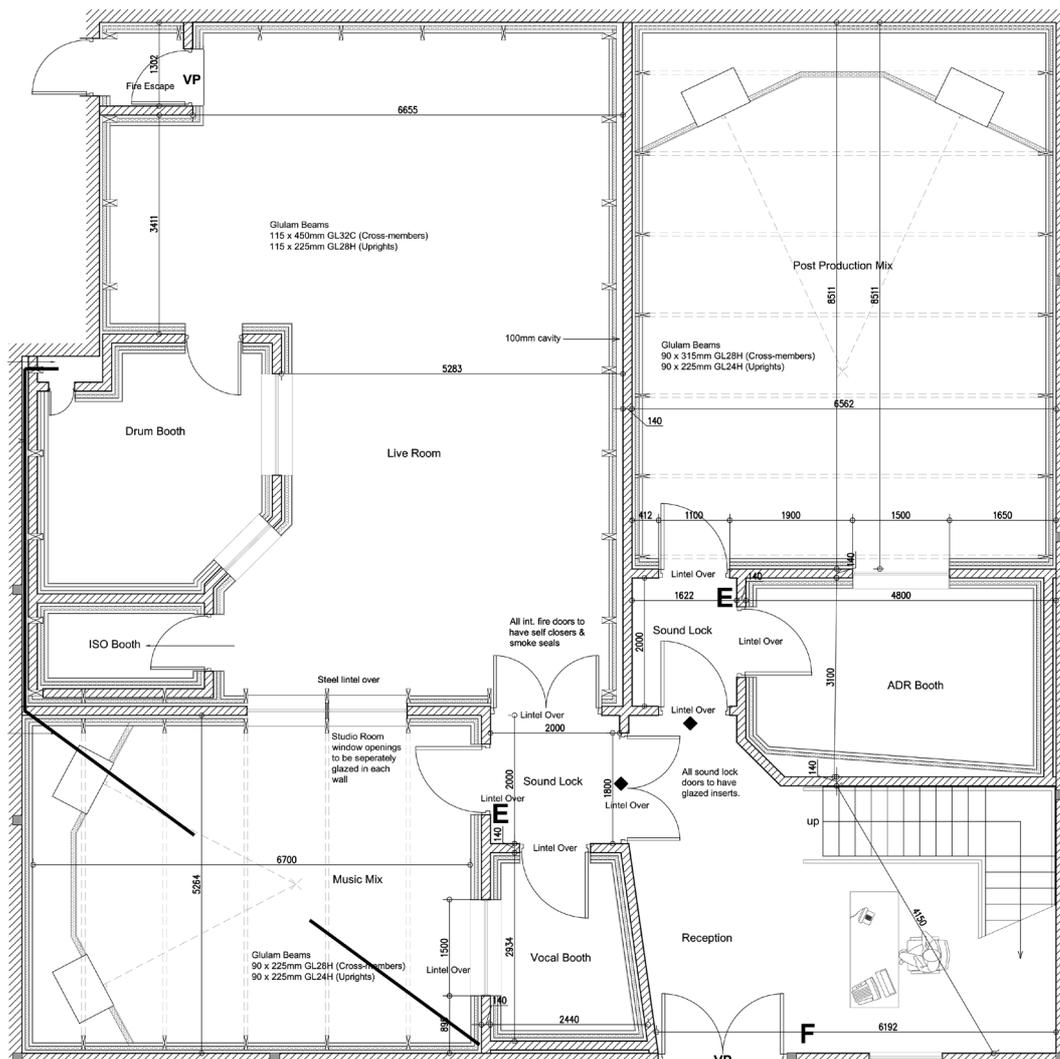


Figure 25: 80hz floor plan

Myself and Matt visited the studio and Matt played a little in the large live room, we were pleased with the character of the reverberation (it was somewhere between the Band Room and Peel Hall in terms of length and not overly bright) so a deal was done and we scheduled two days of recording in April 2012. Working in a purpose built professional facility was a new experience for Matt and it was financially bold (given how little the previous albums had cost), but there was a new sense of momentum building, and more changes to follow.

Matt was no longer working with Gaz Hughes or Adam Fairhall. Taz Modi had taken the piano stool and Luke Flowers (of The Cinematic Orchestra, a major influence on Matt in recent years) was now playing drums. In addition to the standard quintet (Gavin Barras and Nat Birchall remained) Matt invited Linda Mallet (flutes), Rachael Gladwin (who had contributed orchestral harp to a number of previous sessions) and the Japanese koto player Keiko Kitamura to the sessions. It was clear that everyone playing in the same space was going to be problematic in terms of separation and (given the significant studio experience of many of the performers) we now took the decision to isolate the drums in the large booth in the main space and provide all of the players with headphones if required. This methodology deviates significantly from the 'guiding principles' outlined at the beginning of this study, but the fact that line of sight remained uncompromised and, by now, many of the players were used to performing with headphones made it a quick and simple one. I monitored each performer's headphone mix carefully, ready to interject if I sensed that the balance they were working with was having a detrimental impact on the ensemble performance.

Working alongside another engineer was a new experience for me (in this context) but I trusted George's technical abilities and we discussed practicalities at length prior to the first session. I felt strongly that we would need to use more baffles on the session than George had access to, so I arranged to run some over to 80Hz from the university. On arrival, I was surprised to find that George and his assistant had already cabled up lots of microphones. It was a little

awkward to be honest, whilst the microphones were goo (and they had made some sensible decisions about how to use them) I felt that these decisions were mine to make. This situation called in to question the artist, producer / engineer relationship again. George had perhaps assumed that my role was that of producer and that he would be undertaking engineering duties. In reality my position was somewhere in-between. Whilst I had not been credited on previous Gondwana releases as a producer the lines were becoming blurred. I was certainly directing the aesthetic direction of the recordings and my opinion was always sought regarding the success of a take or how we might edit multiple takes to form a 'composite' final performance. There was some confusion about how to credit those involved (with Matt often taking the production credit on Nat's records) but in truth I did not really care at the time and was happy with an engineering credit. However, in this new situation I had to take the lead and although we compromised, and I respected George's opinion a great deal, I 'called the shots'.

We arranged the musicians in the room with line of sight again central to our methodology. From his booth it was essential that Luke could clearly see the rest of the ensemble and vice versa (figure 27).

Drums

George had initially opted for lots of close microphone placement on the drum kit, and although we now had the potential track count to accommodate this I wanted to stick with much more stripped back techniques, in keeping with the aesthetics of the previously recorded material which these recordings might sit alongside. I used a spaced pair of George's SE Neve Rn 17s (cardioid capsules) on the top of the kit alongside a central ribbon mic. Matt had commented that he sometimes felt that the 'ping' of the ride cymbal became a little fatiguing on some previous recordings. I suggested that the 'rolled off' high end of the Royer 121 (as a consequence of the ribbon based design) might serve to alleviate this, whilst also providing some lower middle density.



Figure 26: BLUE Mouse and view into drum booth

Trumpet

I had borrowed a BLUE Mouse (figure 26) from my student Joe Reiser (who assisted on the session), which we put to use on trumpet. The microphone had a similar tonality to the BLUE Baby Bottle, with a little more high-frequency detail. It also shared similarly excellent rejection, as a result the microphone was not baffled. The microphone was amplified with an external Chandler Germainium pre-amp, emphasising lower middle frequencies (and very subtly saturating) more than the Neve Genesys' internal amplifiers.



Figure 27: The ensemble arranged in the live room

Bass

I had used the Baby Bottle (figure 28) on double bass for the Krakk sessions and decided to replicate this as the results were very good. The Baby Bottle has excellent rear rejection (with little problematic off-axis colouration) and the rather idiosyncratic frequency response focussed the capture of the instrument effectively. I again added a Sennheiser 421 (mounted in the bridge) to give us tonal / isolation options if necessary and to match the capture of the previously recorded material.



Figure 28: Harp and bass

Harp

Rachael had contributed to many Gondwana releases prior to this session and her instrument had often proved difficult to capture (solely) acoustically. I had always used the instrument's internally mounted pick-ups in addition to traditional microphones as spill (particularly from the drums and front line instruments) often became problematic, even with the drums isolated from the rest of the ensemble. I again implemented this practice, using a stereo Direct Input box for the pickups, and a single Oktava 012 in cardioid facing the soundboard (figure 28).

Piano

Taz's instrument (a Yamaha U3) was captured with a pair of Neumann KM84 cardioid microphones placed facing the strings of the piano with the wood removed. In addition to this spaced A/B arrangement a single ribbon microphone (AEA R84) was placed on the soundboard to add lower middle weight to the capture.

Flute

Linda's flutes were recorded with an SM7b, the microphone – first developed for radio broadcast – possessed very good rear rejection and focussed the captured range of the instrument effectively.

Room Microphones

In order to capture and have control of the ambience of the large live room we raised a stereo pair (ORTF), high up into the recording space. Although the results were extremely diffuse (lacking locational detail) I considered the final mix presentation when placing the microphones. The bass was positioned centrally with piano and drums to each side and front line instruments sharing the central position (figure 27).

Whilst Nat and Keiko were present on these sessions the tracks featuring their performances were not included on *Fletcher Moss Park*. In fact, only two tracks from the two-day session did, the remaining tracks formed the entirety of Matt's following release *When The World Was One* (Halsall, *When The World Was One*, 2014). This album went on to win iTunes 'Jazz Album of the Year' 2014.

Monitoring and Recording

Developing headphone mixes for the ensemble was a fairly lengthy process, compared to the minimal approach we had adopted on previous sessions. It was essential that the performers mixes were balanced as closely as possible to that of an 'ideal' acoustic situation, in order for them to respond naturally to each other's performance dynamics in this rather alien environment. Regardless

of the sonic opportunities which greater isolation offered we still wanted the record to feel like a live acoustic performance in a single recording space.

With this in mind I made a slightly controversial suggestion. Though it was technically preferential to have complete isolation on the drum kit I felt that the resultant test recordings were rather odd. The separation between the instruments was excellent, but the drums sounded too disassociated from the rest of the ensemble and also a little boxy. Whilst George's drum booth is well constructed there were some middle focussed reflective qualities at high performance dynamics. As a result, I opened the door of the booth a little to let some of the acoustic kit sound enter the live room (I could not help feeling that the door had become a very large analogy to an auxiliary send, connected to a reverberation unit). With careful balancing we arrived at a position which did not compromise separation of instruments in the main room and the controlled spill helped to 'glue' the two spaces together sonically. It was a risky approach but it worked well. On *Finding My Way* however the door was closed completely, aesthetically supporting the electronic influences present in the piece.

Opening the door also meant that some of the performers opted to wear just a single headphone or none at all. Eventually everyone was happy with their own balance and we began to track in earnest.

On a technical level the signal path in 80Hz was superior to that which I had worked with before; the centrepiece of the studio is a Neve Genesys 24 track console and the monitoring was very good (Westlake mains and NS10m nearfields). There was also more choice in terms of pre-amplifiers (Neve or Chandler Germanium) but the single biggest difference from previous sessions was the wall / window between me and the performers. This separation afforded me a better understanding of how a finished mix might come together. I was confident enough to commit to some subtle analogue compression at the recording stage to key instruments such as trumpet and bass and (given the expanded technical team working on the project) I was not so concerned about 'losing' time running between the two rooms to fix any technical issues. I did not use any radically different microphone techniques from those which I had

employed previously, but the separation afforded me a greater level of critical judgement in order to make small changes which cumulatively improved the recordings.

I was generally very happy with the results, however, balancing the trumpet and saxophone against the quieter instruments was again tricky. The space was lively (there were noticeable close reflections from the horns at high dynamics) and I missed the very diffuse reverberation of Peel Hall a little. In terms of separation though, there was no contest between the environments. We had real control of the instruments in the mix but retained an aesthetic in keeping with both the canon and our previous work.

A video clip of the session is included in the Digital Assets, entitled '2.1 Matthew Halsall - The Sun In September (Gondwana Records 2012).mov'.

Mixing

After a period of reflection Matt arrived at a running order for his next release, comprising recordings from four different environments and three different ensembles over a period of two years.

Cherry Blossom: Recorded April 2010 - the Band Room.

Fletcher Moss Park / Mary Emma Louise: Recorded June 2010 - Peel Hall

Sailing Out To Sea / Wee Lan (Little Orchid): Recorded July 2011 – Krakk

The Sun In September / Finding My Way: Recorded April 2012 – 80Hz

Despite the lack of physical continuity, the record was cohesive. The variation in recording environments and instrumentation kept the listener on their toes, but the consistent recording methodology and compositional direction unified the pieces in the context of an album.

Although some of Matt's material which we had recorded in the Band Room and Peel Hall had been problematic in the past the tracks on this record were much less so. *Fletcher Moss Park* and *Mary Emma Louise* had come from the

sessions which produced *On The Go* (as mentioned, a stressful affair) but the dynamics were much more controlled (probably accounting for their omission from that particularly heavy release) and as a result, the mix process was relatively simple.

Matching the earlier recordings with the newer 80hz material required consideration, but again, it was not a particularly difficult process. I did not feel that there was a perceivable qualitative difference (beyond the clarity made possible by greater isolation) between the old and new recordings and over a period of a couple of months I worked on mixes with Matt. This process was again much easier, as I now had my own (aforementioned) project studio in central Manchester. I did not have to beg, borrow or steal studio time to work on mixes and I had become comfortable with my room's acoustic character, following the upgrade of my monitors to a pair of Adam P22a's. I was still mixing 'in the box' but now using more intuitive (and sonically colourful) plug-ins, which were producing good results.

More than any other factor however, I had by this point been very busy making records with lots of artists for around five years. Upon completion of my MA in Composition in 2009 I felt rather 'burned out' on a creative level and I found that working with other people in an engineering / production capacity 'filled the hole' left by the lack of my own compositional output. I had become technically much more proficient and was making fewer mistakes in the engineering process than I had done previously. As a result of working in some great facilities, with some great musicians and engineers, my approach to mixing was now much more informed, I was able to make accurate judgements more quickly and effectively.

However, I was still uncomfortable with taking on the role of mastering engineer. Traditionally it is a 'given' that a mix engineer should not master their own work. A third party is able to hear technical issues which artists, producers and engineers have perhaps become accustomed to over time, this un-biased perspective makes them more able to unify a set of recordings in terms of dynamics and equalization. I had attended some expensive mastering sessions in facilities which were way out of Matt's budget at the time, but George at 80Hz

was producing some really good masters and we could afford to pay him another visit. Although not completely removed from the material (he had been present on the recording of two of the tracks) he had not been part of the mixing process and we valued his opinion highly. I was happy with my mixes at this point but I wanted to hear them in a well-treated room so I took the Logic files to 80Hz and – ahead of the mastering session – spent a few hours refining the mixes. George's Westlake monitors are extremely revealing through the lower-middle frequency range and I was able to iron out some problematic issues in the bass and low-end of the piano which had previously frustrated me.

I handed over the final mixes to George who suggested passing them through his Studer A810 ¼ 2 track tape machine as part of the mastering process. The subtle shifts in equalization and very slight saturation were (as when working on *Akhenaten*) aesthetically pleasing, as a result of the subtle compression / saturation which analogue tape imparts, the stereo material required less traditional dynamic attenuation than it might have done.

Although I am – to this day – very happy with the record I do feel that it is just a little too loud in the wider context of the recorded jazz cannon. George approached this mastering job as he might do any other, and perhaps was slightly too enthusiastic with compression and limiting. This is purely my opinion however and the results are not out of keeping with other contemporary jazz releases. The final results were technically better than anything I had achieved before for the label, Matt was very happy and the record received supportive reviews.

Reception

BBC Music - Daniel Spicer

Manchester musician carves a strong individual identity on album four.

Since the release of his 2008 debut, *Sending My Love*, Manchester-based trumpeter and composer Matthew Halsall has worked through his influences, album by album, in pursuit of an original voice.

His first few albums displayed a clear debt to the spiritual jazz of Pharoah Sanders et al, viewed through the post-trip hop haze of The Cinematic Orchestra; and 2011's *On the Go* dipped into Art Blakey's 50s hard bop. With Fletcher Moss Park, Halsall has nailed a compelling musical identity of his own. The seeds had already been sown. *On the Go's* *Song for Charlie* was a diaphanous ballad with sighing brushwork and melancholic melodies that made Halsall – along with guitarist (and Cinematic Orchestra member) Stuart McCallum – a key figure in a nascent Mancuniana, creating bittersweet, gently-grooving, down-tempo soundtracks for the city's rain-soaked rooftops. *Fletcher Moss Park* – named after a peaceful oasis of parkland in Manchester's urban bustle – develops the idea still further. Pieces like the title track and *Cherry Blossom* use gentle rhythms, simple bass hooks and spacious themes to create understated, introspective moods that owe as much to Erik Satie as they do to Miles Davis.

Like Miles, much of Halsall's skill lies not necessarily in his playing (which can seem a little tentative at times) but in his arrangements and knack for assembling a band. And here he's aided by some of the most talented players in the north of England.

Saxophonist Nat Birchall and pianist Adam Fairhall both bring a depth that connects right back to the 60s and 70s spiritual jazz that helped form Halsall's aesthetic – with Fairhall's comping on the title track revelling in a stately, laid-back authority. And Rachael Gladwin's harp solos on tracks like *Mary Emma Louise* show Halsall's still happy to offer a respectful nod to Alice Coltrane. On the most propulsive cut of the album, *Finding My Way*, Cinematic Orchestra drummer Luke Flowers offers a deceptively driving groove of sticks, snare and rim-shots that nips along like the late-90s acoustic drum'n'bass experiments of 4hero. But it still feels like a beautifully happy-sad afternoon drinking hot sweet tea and watching raindrops run down the windowpane. (Spicer, 2012)

The Independent – Phil Johnson

Trumpeter Halsall is one of the success stories of new British jazz, and this fourth album for his own label offers both continuity and development. The opening sequence, with the spiritual-sounding harp and piano of "Cherry Blossom" leading into a beautiful "Lift to the Scaffold"-esque Halsall solo, and

thence to the modal swing of the title track, is as good as anything you'll hear this year. An atmospheric string interlude, "Sailing Out to Sea", shows where he might be headed. (Johnson, Matthew Halsall - Fletcher moss Park, Review, 2012)

Part 2: The Embedded Producer

This chapter investigates a markedly different form of involvement in the record-making process by the music technologist than the previous. As a result, its format is also notably different. Output Three's commentary is centred on only one track *Fester*, which best exemplifies the creation of the album as a whole. As a direct development of an established working relationship Output Four investigates a further three tracks. The commentary exemplifies a type of producer / engineer participation, common in the field, which might be termed 'the embedded producer'. This role is different to the understood definition of the engineer / producer roles, as established in the in the 1940s and 1950s for example. Edward R Kealey's *From Craft to Art – The Case of Sound Mixers and Popular Music* (Kealy, 1979) charts the development of the engineers' role from that of technical facilitator

The primary aesthetic question was utilitarian: how well does a recording capture the sound of a performance...the *art of recording* was not to compete with the public's aesthetic attention with *the art that was being recorded*. (9 / 11)

to a position which he names the *Art Mode Collaborator*. This model re-defines the engineer as a key collaborator, citing the relationship between David Bowie and Tony Visconti as particularly illuminating, observing that

The standard for judging recordings is no longer merely a utilitarian one – that of capturing sound – but rather a primarily expressive one – that of producing artistic sounds. (18)

Central to the chapter is an investigation of a pre-production process, wherein the music technologist and artists build an oral and cultural relationship in order that everyone involved understands the aesthetic perimeters within which the art work they are creating might exist. Shared listening and shared language are essential to the slow development of this mutual understanding, which once

established diminishes the need for endless discussion and re-evaluation in the recording studio. As Antione Hennion (Hennion, 1989) observes:

Just as later, in the studio, the world with its well-defined relations is held at arm's length. There are only small, day-to-day transformations to make. A frowning brow, a doubtful moue, and the singers will look for what is not working, discard it, and develop something else...The relationship between the artistic director and the singers is a first studio: a two-person universe in which mini artist/public relationships are constructed. Soon, the producer has nothing left to say. It is enough to show a bit of reserve here, to let enthusiasm flag there, for the singers to anticipate the reactions and to redouble their efforts to please. (413)

Hennion positions the producer (or artistic director) as an intermediary between the public world and the world of the artist(s) describing a situation in which a deep trust is developed between the two camps, whilst in the process of record-making.

after being a supporting act, after a cabaret or a test somewhere, someone comes to see the singer, someone whose reputation he or she recognizes: it is the artistic director of some company, or an independent or free-lance producer. "Listen to me rather than the others"; The role of intermediary and the slow process of revelation that follows this substitution (if the singer accepts the scenario that the producer paints) are contained in the first meeting between the two. They now need to be realized.

By standing in the way, the intermediaries capture the attention of the singers. Producers put the obstacle of their bodies between the singers and the public's desire, and this obstacle concentrates on them all the forces that were going in every direction, as long as they did not run up against the localized resistance of a flesh-and-blood listener. By their presence, the producers distract the young

candidates from their showdowns with fame. They take them away from their double-headed dreams: the public and I. Or rather, I and the publics, each in their turn, but publics that no one else has captured: the one that the singers imagined, clamouring for the performer in the packed room, or the frosty public sketched by the sales figures of the commercial director or, again, that of the media representative (412 - 413)

Hennion's observations, although twenty-eight years have passed, remain entirely relevant to contemporary practice. Technical developments have altered this practice a good deal, but the need for close human relationships remains a constant. Many contemporary record producers (myself included) spend periods of time working very closely with a particular band or artist. They embed themselves within existing working relationships, effectively joining the group for a period before moving on to new projects.

Dutch Uncles are a Manchester based 'Art Pop' band comprising Robin Richards (bass / primary composer), Duncan Wallis (voice / lyrics / piano), Andrew Proudfoot (drums), Peter Broadhead (guitar) and – now departed – Daniel Spedding (guitar). I began working with the band in 2009 when they were asked to contribute a track to a compilation EP, *Love And Disaster 1 'new tracks from new Manchester artists'*. The band were young but had played together since their college days (and some of them, since primary school). After various name changes they had released an album through the German label Tapete Records, to a small but enthusiastic response (Dutch Uncles, Dutch Uncles, 2008). The label however had limited UK influence and the band felt a change was necessary if they were to progress their reach. Dan Parrott (who ran Love and Disaster) championed the band and eventually became their manager. Between me, him and our engineer friend Phil Bulleyment we devised a plan to work on some new tracks, pro bono, to try and secure a better UK based deal for the band and complete a new album. We followed up the compilation track with a single *The Ink* on Dan's small project label, which received radio support from some influential DJ's such as Zane Lowe, Huw

Stephens and Marc Riley and attracted the interests of the label Memphis Industries.

After contact was made we organised a 'playback' of the new material we had been working on for Ollie Jacob (one of the label's founders) at The University of Salford. It went very well and the band were wined, dined and signed a recording contract enabling us to complete the record. We now had a budget, albeit a small one, which placed the relationship on a more professional footing. Memphis Industries had released a lot of well-respected music, including albums by one of the band's key early influences Field Music.

Throughout the recording process Memphis were surprisingly 'hands off'. Although they were really interested to see how the record was progressing they gave myself and Phil (as co-producers) a lot of creative freedom and were very happy with the album we delivered, entitled *Cadenza*.

Reflecting on *Cadenza* I think we all feel that it slightly missed the mark, both creatively and technically. There were some great moments, but the record was perhaps a little unfocussed in terms of production aesthetics. However, it put the band on a more assured footing in terms of their UK stature, they toured heavily and played some good-sized festival and support slots.

Output 3 – Dutch Uncles: Out of Touch in the Wild

(Dutch Uncles, Out of Touch in the Wild, 2013)



Figure 29: Dutch Uncles – Out of Touch in the Wild, front cover



Figure 30: Dutch Uncles - *Out of Touch in the Wild*, back cover

In late 2010 Dutch Uncles asked me to produce and co-engineer their next record, Phil Bulleyment would co-engineer and mix. This change in roles requires some explanation. Phil is an excellent engineer and producer, we had worked together on a number of records prior to Dutch Uncles, but there were perhaps some differences of opinion on the *Cadenza* project which led to the reconfiguration of the working relationship. Phil tended to favour a more traditional indie aesthetic, whilst my input drew from more dance floor oriented, electronic and Hip hop sources. For example, I often wanted the drums to be dry and positioned at the front of the mix, whilst Phil generally preferred a more tangible sense of the recording space in the presentation, which was potentially more representative of an ensemble performance. I also shared more musical

common ground with the band, particularly with Robin. We exchanged a lot of music, sharing a love of 20th century classical composers, contemporary minimalism (particularly Steve Reich), Kraftwerk, Talking Heads and Prince. After I left the band Oar – finding myself unfulfilled by much guitar oriented music – I had immersed myself in jazz, electronic and instrumental / experimental Hip hop through the 2000's as the post-Oasis fallout rumbled through Manchester's indie scene. Dutch Uncles along with contemporaries such as Everything Everything and Metronomy represented something which – to me – felt quite different to this; they were musically ambitious, open-minded and groove-oriented. It was a “wonky” groove no doubt, but away from the more cerebral moments you could at least have a good go at dancing to it.

“...the fact that most of the city's emerging young bands pay no heed to the legacy of Oasis, the Stone Roses, or even much post-punk, is one on the scoreboard for evolution. At the forefront of the sea change are Everything Everything and Dutch Uncles, and both their wonky, brainy strands of pop take delight in disassembly: EE like to pull the body asunder to see how we work; Dutch Uncles splay language to look between the lines.”

Laura Snapes – Pitchfork (Jan 2013) (Snapes, Out Of Touch In The Wild, Review, 2013)

In 2011 myself, Dan Parrot and Dutch Uncles took a lease on two rooms above Krakk, a rather dingy club on a dingier still back street in Manchester's Northern Quarter. Here, throughout the year I worked on demo's for the next record. When we recorded *Cadenza* I had been to watch the band in rehearsal and in concert many times, but a good deal of the material we recorded was first heard (by me) in the studio, including the vast majority of the lyrics. Here though, we had twice weekly sessions to look at new material and I would often work in the rehearsal room with them to help shape the new material. One particularly successful session yielded a demo of what would become *Fester*, the forthcoming album's first single.

Robin brought a simple sketch to the room, written for marimba and xylophone. We had been working on another track for a few hours, hitting something of a creative wall when Robin played us the sketch. After some discussion between myself and the band about what meter and tempo worked best for the part I very quickly worked up an accompanying drum part in Logic (influenced by Metronomy's recently released single *The Look* (Metronomy, 2011)) and we then sequenced the embryonic tuned percussion part. Robin had a very sparse staccato bass idea (emphasising the low register marimba parts) which we developed into a 'call and response' riff, between bass and guitar, played in the same register, with heavy reverberation. An idea for a chorus of sorts developed by pedaling the notes of this riff (moving roughly around C and Ab), I thought that a high register synth melody might work and programmed a sound using a patch I had created by sampling an old test oscillator. I suggested that it could sound like Vangelis' *Blade Runner* theme (Vangelis, 1982) and played a high E natural (suggesting C Major), Robin developed this idea and very quickly we had two distinct parts of the song which alternated between a vaguely minor and major/modal tonal centre. After tracking part this we pushed on and I felt that a distinct change was needed to provide counterpoint. I suggested moving the bass pedal to D (much to Robin's initial disapproval) and we took the line on something of a snake-like harmonic walk which finally resolved back to C major. In around an hour we had something which we all knew was really solid. The track was harmonically harder edged and more spacious than anything we had produced to date and crucially (in a way which had not happened before) the demo had laid out a simple blueprint for potential production aesthetics. Although crude, the 'funk boogie' preset drum kit we had used was extremely dry and the snare drum was deep and dull. The heavily reverberated bass and guitar sounds (although simply D.I'd) functioned well and the synth patch was evocative. The demo was given to Duncan (who was not at the initial writing session) and he very quickly came back and performed a fully formed song, which myself and Robin thought was really exciting. This demo (entitled 3.1 Proggy Jean.mp3) is included in the digital assets.

This process marked a change in the way in which my relationship with the band developed over the next few years. My input to *Fester* was more involved

than on some of the tracks which followed, but I began to find myself contributing synth, percussion and guitar parts, making structural suggestions and writing backing vocals for songs on a regular basis.

In a 2013 interview for Under The Radar the band reflected on this process.

Duncan: There's definitely been a change in a production sense. We've taken a lot more time; with the first record we had no idea what we were doing, no idea about production values, we just played the songs and that was that. *Cadenza* and *Out of Touch In the Wild* are a lot more focussed on production. We've got a friend who's produced these records and brought a lot to it. A lot more thought has gone into exactly how we wanted them to sound.

Andy: It's that, and then our writing style has changed. The first album's our first 10 songs, so we didn't feel we were doing that thing of writing songs for five years to make an album. After your first album your writing style changes because you know you've got to have an album out next week and you have deadlines you impose on yourself. In terms of the sound it was all about getting Brendan [Williams, producer] involved as well as sitting in the practice room thinking "How are we going to make this song sound different to the last one?" We've always had a bit of a reputation for being a live band and being in the studio has always been our challenge. We're trying to surprise ourselves more and more each time we do it. (Andrew Proudfoot and Duncan Wallis, 2013)

And similarly in M Magazine:

Duncan: Back during our first and second albums, Robin [Richards, bassist] wrote all the original music. His ideas were finished when he presented them.

On these more recent albums, with our producer Brendan Williams, he's become a silent sixth member of the band. We work very closely with

him. And we're coming to a point where Robin is only bringing in a riff for us to work with. (Wallis, 2013)

We had already worked on one album by this point, but this period (preceding the recording of a second) was the time when we really got to know each other, both musically and personally.

At the project studio we engaged in a lot of shared listening. I had become quite fascinated with Talking Heads' album *1977* (Talking Heads, 1977), equally for the production aesthetics as much as the songs. The drums lacked any processed reverberation and were recorded in a very dry space, they were heavily dampened and tuned very low, the epitome of the '70s drum sound'. I had always been a big Brian Eno fan and introduced the band to some of his work beyond his involvement with Talking Heads (which they knew well). The King Crimson album *Discipline* (King Crimson, 1981), featuring Adrian Belew, who had also played with Talking Heads and Robert Fripp (another long term Eno collaborator) was also a big influence, both compositionally and sonically. I was trawling through some of my very early musical experiences; I went out and bought *Tin Drum* by Japan (Japan, 1981); I have vague memories of stomping around my house to *Canton* as a five-year-old; we listened to *Ghosts* over and over again. David Bowie's *Low* (Bowie) was something of a revelation also, particularly side B, on which he collaborated with Eno heavily (*Subterraneans* was played regularly and loudly). Robin and Duncan listened to Kate Bush's *Hounds of Love* (Bush) on repeat and we all loved Prince. I also lent Robin a lot of Stravinsky chamber pieces, the Ravel string quartet, Glass' string quartets. It was a great time, we were beginning to understand what made us all musically 'tick' and what drew us together as a unit.

There were of course more modern influences but this sound world (routed in the late 70s / early 80s) comprising compressed, thudding, dry drums, shiny (and strangely wobbly) modulated synthetic parts, spiderlike harmonized guitar lines, stacked backing vocals and chugging 'riff like' string parts began to emerge. This combination of influences began to form a blueprint of sorts for the aesthetic direction of the new record. The long process (free from the

financial and time associated constraints of a professional facility) established some 'edges' in the scope of influences which we might draw from. We seldom talked about what we didn't want the record to sound like; the discussions were a positive and essential part of the process.

Our project studio was a place where we refined a workflow (embodying shared language and a shared artistic direction) which would ultimately be transplanted to a larger professional facility. Without access to such a place it is likely that we would not have felt so confident in the new environment in which we sought to complete the record. In his article *Nests, arcs and cycles in the lifespan of a studio project* (Slater, 2015) Mark Slater aligns the concept of the nidus (or nest) with that of the project studio.

This place of safety, like a nest, is where something emerges, develops and grows. The mobility of computer technologies means that a project studio could coalesce in any number of places, or could be constituted physically and virtually (73)

Many of the records we referenced had extremely high production values, they had been expensive records to make, in a period when money (due to much higher sales of physical product) was often less of a concern. With a modest budget confirmed (around £10k for the entire project) we began to look for a studio where we would begin work on the next record. Having access to the University's facilities had been an essential part of getting the Dutch Uncles project off the ground and completing *Cadenza*, but we all wanted to work somewhere where we could stretch the sessions out over longer periods and I wanted to be away from 'work'.

Whilst I wanted to get paid for my efforts, I felt strongly that maximizing recording time on the sessions in order to produce the best possible release was much more important to me (and my long-term career) than maximizing any profit. The band's first album had been recorded quickly in a very well specified residential studio in Hamburg. We had considered some local studios (as previously mentioned, we took a look at the newly built 80Hz) but did not

feel that anything was suitable and the band all wanted to get away from Manchester again.

Whilst the rationale for rejecting local studios was primarily based on cost / geography, room acoustics were high up the list of my own priorities. Whilst 80Hz was very well specified, the large reverberant live room would have been a hindrance in terms of what we were trying to achieve sonically; It was highly likely that we would spend a great deal of time 'fighting' the natural reverberation of the main space. Our consultations had arrived at a mutually understood – desired – recording and mix aesthetic, which called for intimacy and accuracy in the capture, with the potential for heavy spatial processing.

Through this process of consultation, I was able to plan my technical methodology in order to best capture what we were trying to achieve sonically. I felt emboldened to create recordings which were as close as possible to this vision, as quickly as possible. *Cadenza* had involved a lot of 'back and forth' in the mix process as we attempted to imbue some occasionally rather non-committal recordings with a definable aesthetic characteristic. We wanted to avoid this and a list of criteria was boiled down to the following key points:

- A preference for recording spaces with short (or no discernible) reverberation times.
- Enough recording spaces to allow the core of the band to play simultaneously (if appropriate), with complete isolation between sources.
- A high quality microphone stock.
- A good collection of outboard equipment, with a particular emphasis on compression / saturation.
- Interesting electronic reverberation processing or the ability to use recording spaces as 'chambers' to capture natural reverberation.
- Infrastructure which allowed us to incorporate some of our own processing equipment.
- Infrastructure which allowed us to incorporate synthesisers via MIDI.
- Access to a space big enough to successfully record a string quintet.

A friend suggested a studio in Wales called Giant Wafer, it was cheap (£150 per day dry hire, with a £5 per night – per person – accommodation charge) and residential, but the sparsely populated website did not tell us a great deal about the place beyond some familiar microphones. We took a trip (2.5 hours of relentless roundabouts through mid-Wales) to Llanbadarn Fynydd in order see the studio in August 2011 and were frankly stunned by how well the space was specified.



Figure 31: Outside Giant Wafer

The studio was managed by Ed Lewis, a vegetarian music technology fanatic, from a long line of cattle farmers. Ed had built a lot of ‘cloned’ analogue hardware and a local technician (formerly of SSL) had advised on and calibrated the equipment. Ed had replaced the studio's original large format mixing desk with a Spec Audio LiLo routing / summing console with a rack of 24 very high quality external microphone pre-amplifiers. The microphone stock was also excellent, comprising models I knew well and many modified and unusual offerings.

Whilst the two performance spaces were relatively small (Figure 32) they were very well acoustically treated. The main room relied primarily on half sawn posts (figure 33) which lined the internal walls, acting as simple but very effective parabolic diffusers, resulting in a short reverberation time which could be further controlled by Ed's very well constructed mobile baffles. There was a ‘dead room’ which was big enough for a drum kit and contained a further two small isolation booths, big enough for amplifiers (not illustrated in the original floorplan, figure 32).

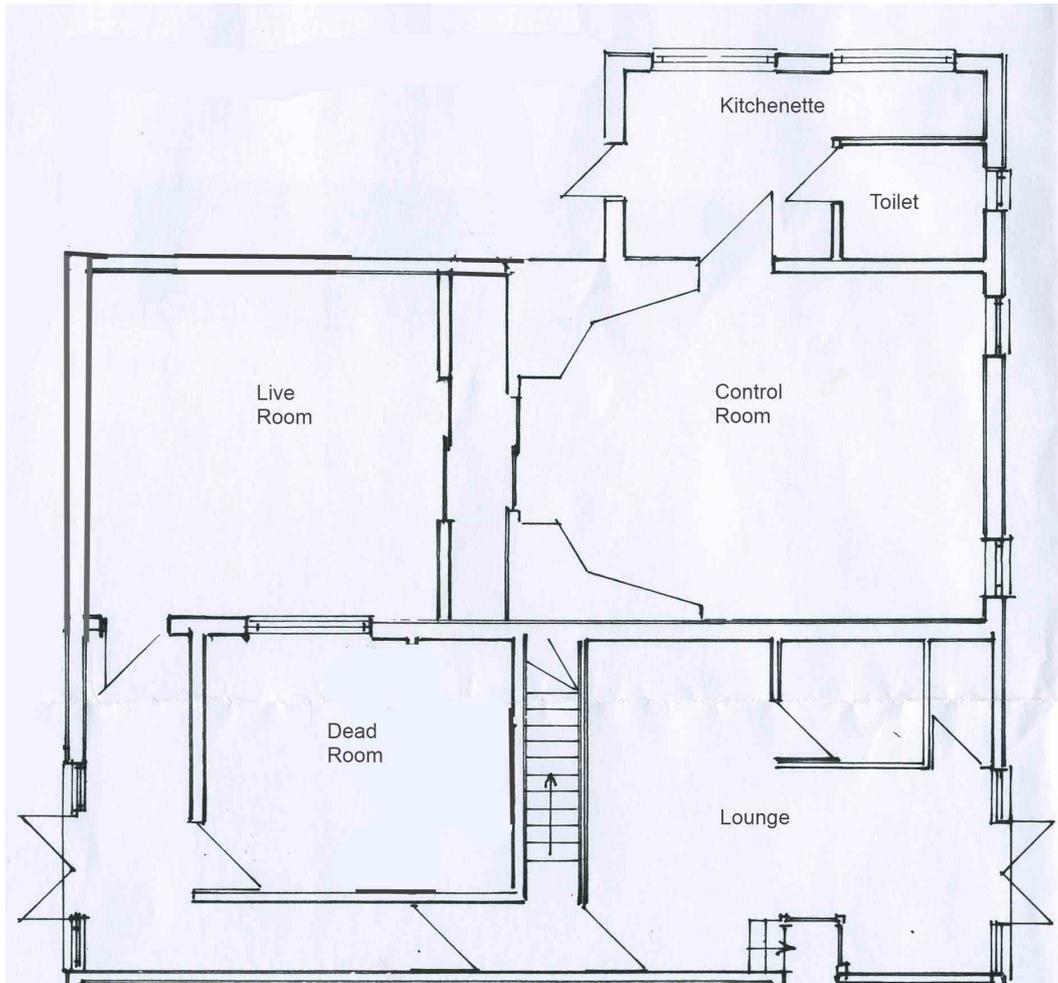


Figure 32: Giant Wafer floor plan

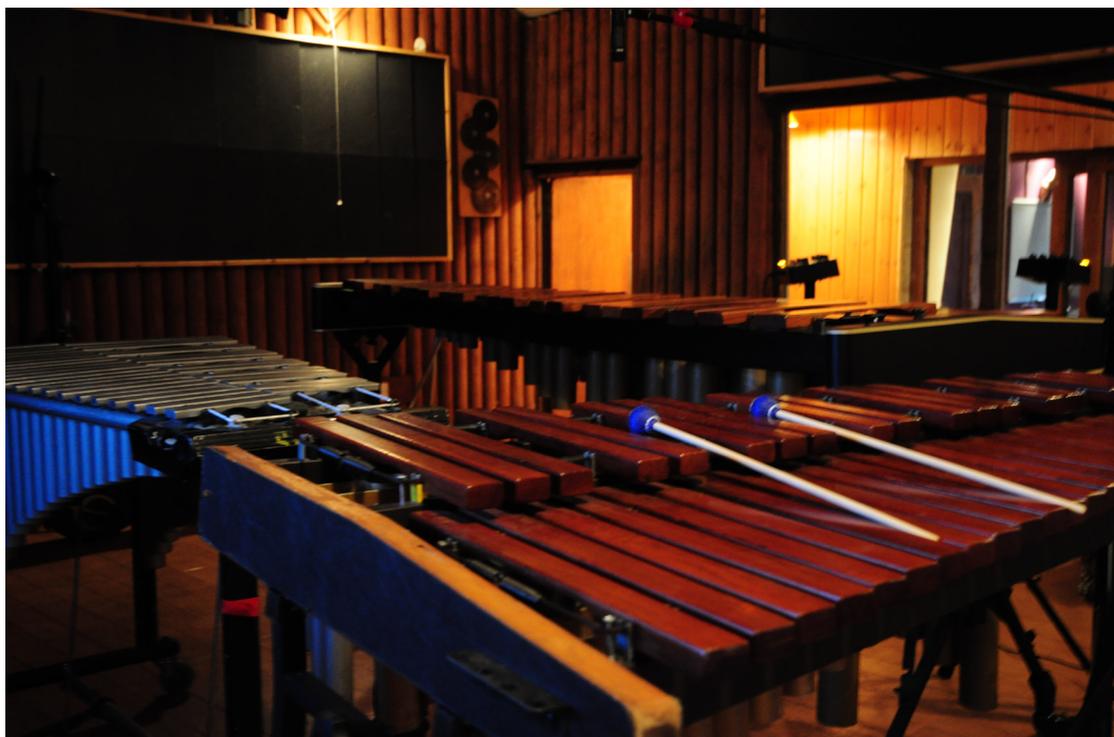


Figure 33: Giant Wafer live room, half sawn posts functioning as parabolic diffusers

The control room was very large, and on listening to the monitors we all knew that we would be able to work very happily there, the response of the room was accurate and even across the frequency spectrum. Everywhere we looked we found interesting instruments (great drums, guitars, synths, keyboard instruments etc.) and a number of reverb units with “Tchad Blake” written on them. On asking Ed if these were anything to do with the legendary Texan producer / engineer he replied “Yeah, he lives over the hill, he mixes in the box now so he just leaves all his stuff here”.

We did not have to think a great deal about whether this was the right place to make the record, it fulfilled both our creative and technical criteria and exceeded our qualitative expectations. A deal was done and we subsequently booked three recording sessions, the first of which would be a three-day session in December 2011, coinciding with a break in my teaching commitments.

We spent the following three months working on demo's. *Fester* had to some degree established an aesthetic methodology and more tracks were coming to fruition with this blueprint in mind. The band were still touring *Cadenza* but also began ‘road testing’ the new material we had been working on. As the first session approached we discussed how best we might use our time. I felt strongly that I wanted to record a single track from beginning to end. Whilst it might have been more economical (both financially and in terms of time) to use the session to work on drum capture for multiple songs, I really wanted to explore the possibilities of the studio fully and establish a workflow for the two much longer sessions we had booked in January.

The process of establishing a workflow for an album project is both very important and sometimes complex, there are many issues to consider. First and foremost, there is the task of keeping track of all the pre-determined parts which need to be recorded. As the primary composer Robin produced a spreadsheet to get this process started (figure 34).

		Drums	Bass	Guitar 1	Guitar 2	Piano	Rhodes/KtMarimba	Xylophone	Vibraphon	Glockensp	Violin 1	Violin 2	Viola	Cello	D Bass
Queenie (Voicey Voice)	130 bpm	Andy *	Robin	Sped	Pete	Duncan	Sped								
Fester	133 bpm	Andy *	Robin *	Sped *		Duncan *	Duncan *	Pete *							
Bello (Seventeens)	98 bpm	Andy	Robin	Sped		Pete	Duncan								
Steamed Rice	167 bpm	Andy	Robin			Duncan	Pete								
Moghead	155 bpm	Andy	Robin	Sped	Pete		Duncan								
Japan	118 bpm	Andy *	Robin *	Sped *				Pete	Duncan						
Norma	175 bpm	Andy *	Robin	Sped	Pete	Duncan	Duncan								
Pronce	125 bpm	Andy *	Robin *	Sped *		Duncan	Pete								
New Song	120 bpm			Sped	Pete	Robin									
Wilhelm	153 bpm	Andy	Robin	Sped	Pete	Duncan									
Fust (B?)	146 bpm	Andy	Robin	Sped	Pete	Duncan									
KK (B?)	155 bpm	Andy	Robin	Sped	Pete		Duncan								

Figure 34: Spreadsheet detailing core instrumentation

A producer needs to maintain a band’s energy levels throughout the duration of the recording sessions; it is important that all members feel valued and engaged in this process but also that no member is left with a huge amount of responsibility on their shoulders for too long a period of time. I have always found the ‘production line’ process of record-making a little counter-intuitive. Whilst it makes sense in terms of economy for each musician to overdub their parts one by one, ‘building’ the entire album instrument by instrument, I have found that this workflow can sometimes be both creatively unrewarding and, for the members of the band, often rather boring.

Whilst we had recorded *Cadenza* in a largely ‘production line’ fashion there had been a couple of songs where we had pushed through the entire process. I had enjoyed this approach much more, as it was easier to hold on to a sonic vision for the track and also allowed for a space where semi-improvised parts or additional textures might emerge. It became much easier to judge the success of a new part when you very quickly laid a subsequent one on top. In many

respects this resulted in a form of 'creative economy'; we made better musical decisions, quicker.

The process I had adopted in the early Gondwana sessions (all musicians playing live in one large space) was simply not going to work on the forthcoming sessions. The parts were often technically very demanding, requiring multiple passes, compiling and editing to realise. In terms of the numbers of musicians involved on some tracks we simply did not have enough simultaneous channels to record all the parts at once, or ensure adequate separation. But beyond these technical limitations the reason for reject such a methodology was primarily routed in aesthetics. Brian Eno, in his forward to the OHM compilation *The Early Gurus Of Electronic Music* (Various, 2000), discussed the notion of 'describable islands of sound'.

For classical composers, there were certain describable islands of sound: a clarinet, for example, is a number of sonic and playing possibilities, whereas a harp is another. If you write "violin" in a score, everybody knows what you mean. That isn't possible, however, if you write "electric guitar" or "synthesizer." A synthesizer isn't really, in that sense one instrument; it is a bag of possibilities from which you assemble your instrument. (Eno, 2000)

Whilst some of the core instrumentation we were recording was acoustic (and as a result one might argue that it was sonically 'describable' in terms of representation) we knew that each sound we recorded would be considered in great detail and potentially heavily sculpted. I knew that specific drum, bass, guitar and synthetic sounds would require a level of consideration only achievable by the kind of reflection which the recording process offers and that (in some cases) parts which were originally composed for one performer might be adapted for multiple instruments in pursuit of sonic interest. As a result, it was understood that we would predominantly lay down tracks with only a few or indeed just one member(s) of the band performing in the initial tracking sessions.

So, the band, Phil and I decided to tackle *Fester* in these first few days. The track had been played live a few times and the structure of the demo had largely withstood the 'road test'. We bundled a good deal of equipment (including a marimba, vibraphone and xylophone I had borrowed from the university) into the back of a splitter van and headed off on the considerably-more-icy road to Giant Wafer.

Fester

This study will focus on the recording of *Fester* as the processes involved in its creation highlight most clearly my input into the larger process of realising *Out of Touch in the Wild*. Word count dictates that much must be omitted, a track by track investigation of the album (which took seven people circa three months of solid work to complete) is not possible, although I will touch upon the creative and technical processes relating to other songs on the album at the end of this study.

In the weeks preceding the session I had put a good deal of time into thinking about snare drums; I considered the instrument's role in the track to be vital and knew that the amount of space in the arrangement called for something really engaging. I experimented with lots of my own drums, using different skins and low tunings in order to arrive at a sound which felt similar to some of the reference material previously mentioned. I settled on a 14 x 7 wooden drum with a coated hydraulic top skin, it was tuned very low (with a deep and distinct fundamental) and was stowed away as an alternative to the selection of drums at the studio and was eventually, after extensive comparison, used.

The session began by building a drum kit. I opted to work in the dead room, in line with the aesthetic considerations we had outlined. We experimented with the studios' T Drums kit, but opted to use Andy's larger Drum Workshop shells (24, 13, 16) for *Fester*, as they allowed for deeper tuning. I tuned each drum whilst listening to the demo we had made, pitching the bass drum to the root note of the chorus and the snare's fundamental an octave above to further enhance the feeling of release when the tense verse finally resolved to the

chorus's major key. I'm still very proud of the snare sound we captured; it is so deep that people sometimes assume it is a bass drum when first listening to the initial moments of the song. Forthwith, a rhythmic 'flip' happens in the listener's mind, as a result of this false assumption.

Microphone Technique (Drums)

Instrument	Microphone	Polar Patter	Position
Bass Drum 1	Sure Beta 52	Cardioid	3cm inside hole
Bass Drum 2	Geffell UM900	Cardioid	40 cm from back
Top Snare 1	Sennheiser 441	Cardioid	15cm from top
Top Snare 2	Josephson E22s	Cardioid	15cm from top
Under Snare	Beyer M88	Hypercardioid	15cm from bottom
Floor Tom	Beyer MD421	Hypercardioid	15cm from top
Hi Hat	Schoeps CM6	Cardioid	25 cm from top
Overhead 1 Left	Royer 121	Bi-Directional	80 cm above
Overhead 1 Right	Royer 121	Bi-Directional	80 cm above
Overhead 2 Left	Gefell M900	Cardioid	80 cm above
Overhead 2 Right	Gefell M900	Cardioid	80 cm above
Room PZM	Crown PZM		In front of kick
Hallway Left	AKG 414	Cardioid	Corridor joining drum room to main room. ORFT
Hallway Right	AKG 414	Cardioid	Corridor joining drum room to main room. ORFT



Figure 35: Drum microphone placement 1



Figure 36: Drum microphone placement 2. Note: A different snare drum and bass drum were used on Fester to those pictured, although the microphone models / positions are the same.

The process of comparing, placing and establishing phase coherence between the microphones took around six hours. The two pairs of overhead microphones sounded interesting and usable, so we decided to record them both to give ourselves options. We spent a good deal of time working on phase cohesion

between the multi-microphone set up (figures 35 and 36). Although 180 degree phase 'flips' can be applied in post-production I like to track with these decisions committed to the recording medium. A simple phase flip does not always solve the problem at hand. We spent time making small adjustments to the height of the overheads in order to achieve as much cohesion (through time based alignment) as possible against the close microphones. We also investigated parallel processing by routing a mix of the drums through some outboard equipment comprising a Ridge Farm Boiler (compressor) and an Anamod tape simulator. We were very impressed with the quality of the signal path in the studio; The pre-amplifiers (again clones, designed to emulate API 312s and Neve 1073s) sounded excellent and the AD/DA conversion was very impressive.

We then began to record drums and a D.I'd bass part along to our demo, with the respective demo parts muted. Both Andy and Robin were very well rehearsed and seven takes later we felt that we had what we needed. A composite take was constructed largely from the final pass, with small 'patches' taken from takes three and five.

A relatively small amount of editing was required before we continued with other instrumentation, but past experiences had taught me that (no matter how time consuming it might be for me, and potentially boring for the members of the band) it was essential that all editing was completed before the next musician overdubbed their part. Small rhythmic mistakes tend to 'ripple' through an overdubbed project (each subsequent performer having to adapt to the mistake), potentially creating moments which lack rhythmic integrity or 'groove' which are often very difficult to unpick and rectify later in the process recording-making process.

Tuned Percussion

Having had a good deal of experience recording similar parts (I had very recently worked on new, as yet unreleased, recordings of Steve Reich's Double Sextet and Nagoya Marimbas with the contemporary music group Psappha) I

opted to record both the xylophone and marimba using spaced pairs of cardioid microphones covering the played range of the instrument. We tried some very capable condenser microphones, which captured the instruments with a great deal of detail, but in the context of the mix (and previously defined aesthetics) I felt that they were too bright, with a little too much of the room in the capture. We tried some ribbon microphones but then settled on a pair of humble Shure SM57s (figure 37). The relatively narrow frequency range of the microphones helped both the marimba and xylophone sit more comfortably in the mix. An additional pair of Gefell UM70s were used as room microphones, giving us the option to add more space and widen the stereo image if necessary.



Figure 37: Recording the marimba

Electric Guitar

The studio was very well equipped with a range of amplifier heads and cabinets. Speakon tie lines ran between the control room and all the live spaces, including the living room. This enabled the performer to play from the control room and improved communication whilst working through the recording process (figure 38). We set about the process of auditioning amplifier heads with a range of cabinets and a number of microphones. This was a long but essential process; we were working primarily with our own instruments but were very keen to explore the possibilities which the studios equipment might offer.

Over the course of around four hours we narrowed our options down, making notes regarding which combinations worked well (with future sessions in mind). On *Fester* Daniel Spedding's guitar part was performed on an Epiphone 335 running through a Blackstar Artisan 100 head (figure 39), into a 2 x 10 cabinet. We paired the microphone choices down to a Royer 121 ribbon microphone and a vintage AKG 414 with a brass C12 capsule (figure 40). The two microphones complimented each other well, offering distinct options in the mix between the wide, open frequency response of the 414 and the more middle focussed Royer.



Figure 38: Tracking guitars from the control room



Figure 39: Guitar amplifier heads, the Speakon patch panel is visible on the far right

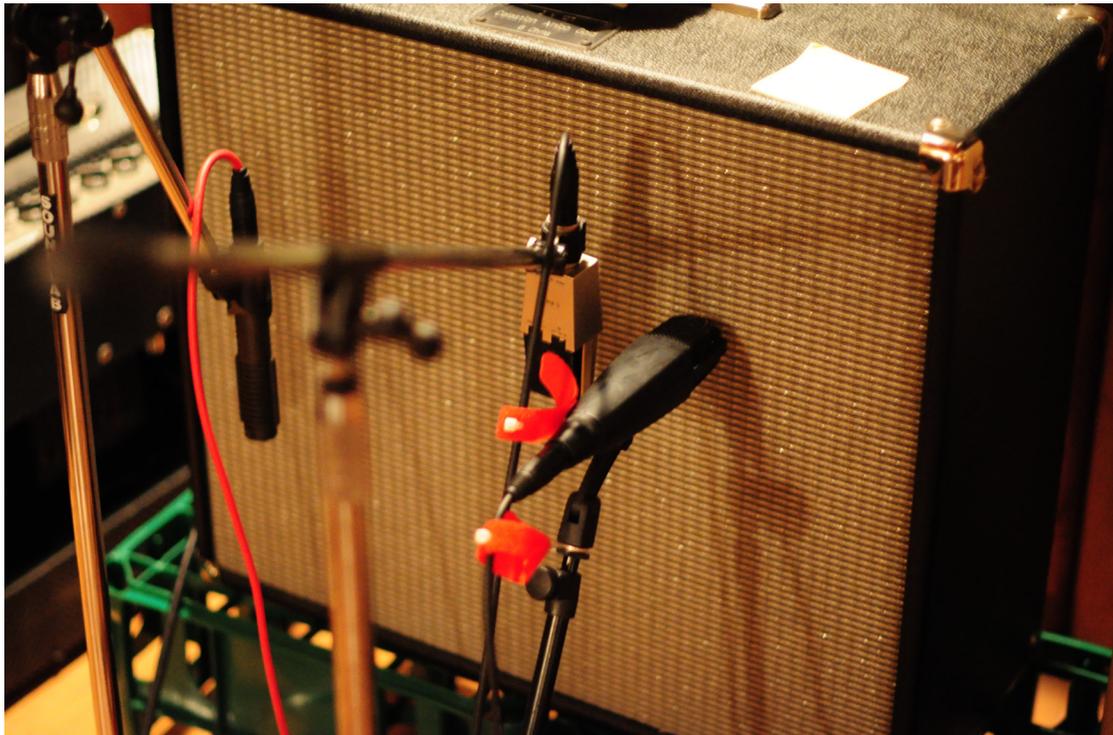


Figure 40: Guitar amplifier microphone placement

We also sent the guitar signals to my own Great British Spring reverb unit (following the success of our experiments within the demo). Early in the process of setting up this signal chain I suggested panning the mono reverberation channel to the extreme opposite edge of the stereo field from where the guitar part was placed. This created a really interesting effect: As the dry guitar part sounded, there was a distinct movement from the right to the left speaker as the signal dissipated into long metallic reverberation. We were so pleased with this effect that we later duplicated the process (with a reversed stereo image) with the bass guitar in the verses of the track.

Bass Guitar

Robin's D.I'd bass part was re-amplified through an Ampeg SVT classic head into a 1 x 15 cabinet (again, after a period of comparison). We used the same GBS reverb technique on the instrument, creating a lot of movement between the left and right channels of the mix and maintaining sonic interest through the sparse, angular verses.

Additional Guitars

To add emphasis and depth to the 'bridge' we tracked another (more obviously distorted) re-amplified version of the bass part. Taking this idea a step further we doubled Robin's part with a Dan Electro baritone guitar and two passes of Daniel's guitar (again with a thicker, more saturated tone). The combination of these four parts in unison (an octave apart) created a sense of release from the tight minimalism of the piece so far, and the slight tuning variations across the parts created a much thicker texture.

Synthesisers



Figure 41: Roland Juno 6

The sound I had programmed whilst creating the demo of *Fester* was created by sampling an old square wave test oscillator, which I tuned by ear. The samples were mapped over a keyboard using Logic's EXS 24 sampler and by manipulating the parameters of the amplifier envelope I arrived at a synthetic 'string like' result. Whilst I was very happy with the sound the studio had a Roland Juno 6 poly-synth with Kenton MIDI retrofit (figure 41), which I wanted to explore. We coaxed a similar sound, with a similar shape, out of the instrument

and the combination of the two patches worked very well together. Again, the slight variations in tuning created a subtle chorusing effect in line with many of our references. We also used the synth to reinforce the bass line in the choruses, doubling the part with a heavily low pass filtered line on the Juno.

Later in the process (after recording Duncan's vocal performance) I felt that the bridge needed greater depth and energy, and began working on a synth part on the Juno 6, which Robin developed and eventually we played the part together as the keyboard fingering was a little too tricky for either of us. The line emphasises the rhythm of Duncan's delivery, with a fast attack and long decay.

I then developed a 'swelling' synth part (using a slow attack envelope with no release) which dovetailed into the aforementioned synthesiser part, in the final mix these swells move between the left and right edges of the stereo field.

In the final chorus a second synthesiser line was added, harmonizing with the original part.

Piano

The piano line in *Fester* slowly builds through the bridge and comes to the fore for the final double chorus. The part is a distillation of the marimba and xylophone lines and was performed by Duncan Wallis. The piano was overdubbed after the initial three-day session in December (along with the album's other piano parts) as it was uneconomical to hire the instrument for a session focusing on just one song. We used an excellent Yamaha U3 upright which we had asked to be tuned to A442.

The rationale for this (and indeed raising the pitch of all the instruments capable of variable tuning) was that we knew how important a role the tuned percussion instruments would play in the album, and many of the tracks which featured them also featured piano. All of the tuned percussion we took to Wales was pitched at A442, as is standard practice in the UK. We did some experiments

(with the guitars and synthesisers) in the first session and we all felt that there was a subtle 'sweetening' if we tuned everything to match the tuned percussion.

The U3 is a big piano (130cm high) with a rich tone, not dissimilar to that of a C3 grand. I took the woodwork off the instrument as I find that this offers many more recording possibilities. Removing the front of an upright allows for direct microphone access to the strings and I had worked from this perspective successfully when recording Matthew Halsall's ensemble in the Band Room. I wanted to try recording with two techniques simultaneously as I thought it was probable that different tracks on the album would require a different presentation. We placed a pair of Schoeps CM6's (with cardioid Mk 4 capsules) in a spaced cardioid configuration on the keyboard side of the piano around 50cm from the strings (figure 43) and a pair of Gefell UM70's set to a bi-directional polar pattern in a Blumlein configuration on the soundboard (figure 42). I took care to measure the distance from the piano's string-bed to the spaced cardioid microphones and duplicate this distance to the Blumlein array (subsequently inverting the polarity of the microphone pre-amplifiers) to ensure phase coherence.

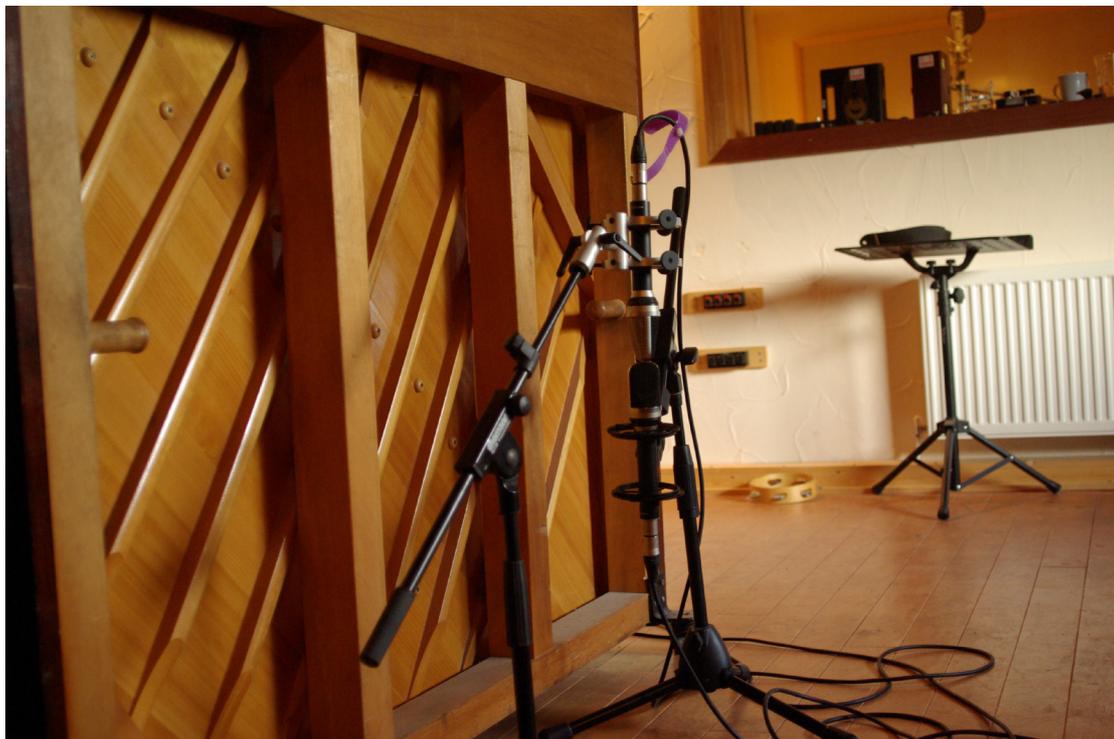


Figure 42: Blumlein array - Gefell UM70s



Figure 43: Schoeps CM6s in spaced cardioid array

The two microphone configurations offered distinct possibilities: The Gefell UM70s sounded very bright in this position, lacking low / lower middle weight, but the Schoeps CM6s were positively dark in comparison, with tightly defined low frequency capture. Across most of the tracks on the album – including *Fester* – we arrived at a balance of the two, favouring the Gefell's when the piano needed an extra 'push' to cut through a dense (upper middle frequency) arrangement.

Aesthetically we investigated how to present the piano. In the mix the instrument is heavily compressed and the stereo field is widened by the use of a deep chorus effect, the final sound is reminiscent of much Detroit 'piano house' music of the 1990s.

Vocals

We again used this first vocal recording session to audition a multitude of microphones, working our way through familiar models and trying some of Ed's more esoteric offerings (figure 44). I always try to audition microphones for a vocal performance 'blind' as I find it difficult to ignore the eye-watering cost of

some of the equipment involved in the decision making process. We ended up favouring the Gefell 900 and a FLEA valve U47 clone. On *Fester* we chose to work with the FLEA 47, favouring its subtly brighter tone in the context of the monitor mix so far.



Figure 44: Recording vocals

In this auditioning process, we also auditioned some of the studio's outboard equalization units and compressors. We were impressed with the character of the API 550a eq, which we used to very subtly boost very high (around 12Kz) frequency information and settled on an LA2a clone, again used very subtly, to compress the dynamic range (reducing the gain by around 6db at the most). These changes, which we felt were aesthetically appropriate also served to enable Duncan to tailor his performance in the context of the mix more accurately; I generally compress vocals at the tracking stage if I know that this processing will be required in the mix, working in this positive and decisive way also makes a performer less likely to move away from the microphone in the louder passages of their delivery (as their dynamics are reproduced to them through headphones in a more controlled way), physical movement such as this is often problematic as a voice's tonal character can be adversely altered by audible changes created by variation in the proximity effect.

The vocal recording session itself took around four hours. We were all very happy with Duncan's pre-prepared lyrics, melody and phrasing, but a number of suggestions and alterations were made through the session.

A doubled lead vocal track was added in the choruses (first appearing at 0:55) to further differentiate the section sonically from the verse, as although the instrumental parts were altered (and the synthesiser part changed the harmonic relationship), the chord sequence was essentially the same.

This doubling technique was also applied to the line "I know my life is complicating the whole" (1:42), before the entry of the second chorus.

The bridge (2:16 – 3:07) was embellished with two close vocal harmonies which I wrote, these parts are introduced as the section builds towards the final chorus, thickening the texture significantly. I also suggested a rhythmic variation on the penultimate line of the section ("I trust the worst is hard to know") in order to create variation and signify the return of the chorus.

The performances were compiled from the multiple takes (around six on each line). This was a democratic process of sorts between myself, Duncan and Phil. Ultimately if there were disagreements on particular phrases Duncan would have the final say, with his eye primarily on the character (aiming to articulate his narrative) of the delivery, provided that I felt tuning and timing were accurate. This was a relatively easy vocal session, there were much more demanding experiences as we moved further into the album.

Additional overdubs

A tambourine part was added to the arrangement, entering in the bridge and continuing to the end of the track, primarily to add high frequency intensity as the piece developed.

A very dry 'multiple hands' clap was added, doubling the snare drum in the choruses. In the mixing stage this part was further embellished, with an 808 snare drum and 'double clap' used to mark the transitions into each chorus. Phil recorded this extra clap in his studio (Edwin St), the live room's bright acoustics are audible.

In the mixing process I added a white noise 'burst', with a fast attack and long decay (fulfilling a similar role to a crash cymbal) to emphasise the entry of the second chorus. We also added a sampled snare drum, with a much higher pitch and more defined attack to the choruses, again to add further differentiation.

Mixing

Mixing *Fester* was a protracted process. Phil sent a draft of the mix whilst we were back in Wales for the first longer session in January, but it was not formally 'finished' until the summer of 2012. I fought my corner throughout the process, aiming to keep the drums as dry and as far forward in the sound stage as possible. This was both my preference and also I felt that it was key to 'repositioning the band' in the eyes of the media. *Fester* was long regarded as being the most probable first single on the album (which did turn out to be the case) and I wanted it to signify a change in direction for the band; pre-empting the release of a more electronically oriented, minimal and aesthetically focussed record. There were around 24 mix revisions in all. I attended the vast majority of the mix sessions yet gave Phil space where necessary, particularly at the beginning of the process as he established a workflow and mix architecture. The number of revisions represents not a frustration with the track, but a desire to get the presentation 'right' at all costs, indeed many of these revisions were very subtle as we worked towards the final mix. Although there is of course variation, the mix aesthetic we established on *Fester* remains generally consistent throughout the album.

Realising *Out of Touch in the Wild* was – at the time – without a doubt my most involved production experience to date (other than the processes around the realisation of my own compositional material). *Fester* was actually a relatively

Spartan affair when compared to tracks such as Flexxin' and Godboy, where we worked with a string quintet and I again contributed many layers of synthesisers, guitar, backing vocals and percussion. Throughout the process of recording the album we experimented with recording drums in the larger – more acoustically complex – live room (*Nometo*), heavily compressed hand claps in a toilet (*Bellio*) and began to develop a solid understanding of the sonic possibilities which Giant Wafer had to offer. I also had to develop strategies for dealing with both the band's and my own gradually consuming sense of 'cabin fever' and mental fatigue as we chucked up around 22 days of studio time with few breaks. A good deal of further work (over the course of the next four months) was undertaken on the record in our project studio space on returning to Manchester, including writing and recording three of the vocal performances.

By the summer of 2012 we were nearing the end of the process, in anticipation of a September album release, when Memphis Industries announced that they would be delaying the release until January 2013, due to a busy global schedule for the label. It was very frustrating to have to 'sit' on this record, on which we had worked so hard, but we had to trust that the label understood the landscape. *Fester* was released on November 7th 2012, preceding the album's release on January 14th 2013.

Reception

We could not have hoped for a better start to the campaign. *Fester* – now accompanied by Issac Eastgate's excellent video (Eastgate, 2012) – picked up a number of important placements, including a Vimeo Staff Pick and a Pitchfork video feature. Most importantly though the track was placed on the BBC 6 Music 'A' playlist and played on heavy rotation. The single has had in the region of 93k You Tube views to date.

The Album itself was met with generally very positive reviews, including a lead review in the Times' Saturday music supplement (8/10), a positive response from the Guardian (4/5) and a great deal of support from

specialist music publications and web based magazines. The second single Flexxin was again 6 Music 'A' playlisted. The band played bigger and bigger shows through the year culminating in shows at Manchester's Gorilla (circa 650 capacity) and London's Scala (circa 700 capacity) and eventually were asked to support the US band Paramore throughout Europe on their summer 2014 tour, playing to crowds as big as 12k.

Pitchfork (Laura Snapes)

...Dutch Uncles stick to a rigidly pointillist, exacting scheme of glassy, Reichian xylophone and marimba, Talk Talk-y guitar ticks, and choppy Stravinsky-inspired string sections, for a prismatic take on herky-jerky pop that approaches complex situations like a beguiling data visualization.
(Snapes, <http://pitchfork.com>, 2013)

NME (Dan Stubbs)

They may not be the most hyped current Manchester band, or the one with the most vocal hometown support, but Dutch Uncles might be the best. Their third album proper, 'Out of Touch in the Wild' sees them evolve into the Field Music you can dance to – or the Talk Talk you can smile to. This is thanks to clinically clean production, a pensive, taut mood that pervades throughout, and about a billion xylophone bongs. It's a touch clever-clever, from the perplexing one-word titles ('Pondage', the brilliant 'Fester') to the abundance of Peter Gabriel-like cerebro-pop stylings, but they're Dutch Uncles, not Dumb Uncles. Long may they brain. (Stubbs, <http://www.nme.com>, 2013)

Output 4 - Dutch Uncles: O Shudder

(Dutch Uncles, O Shudder, 2015)

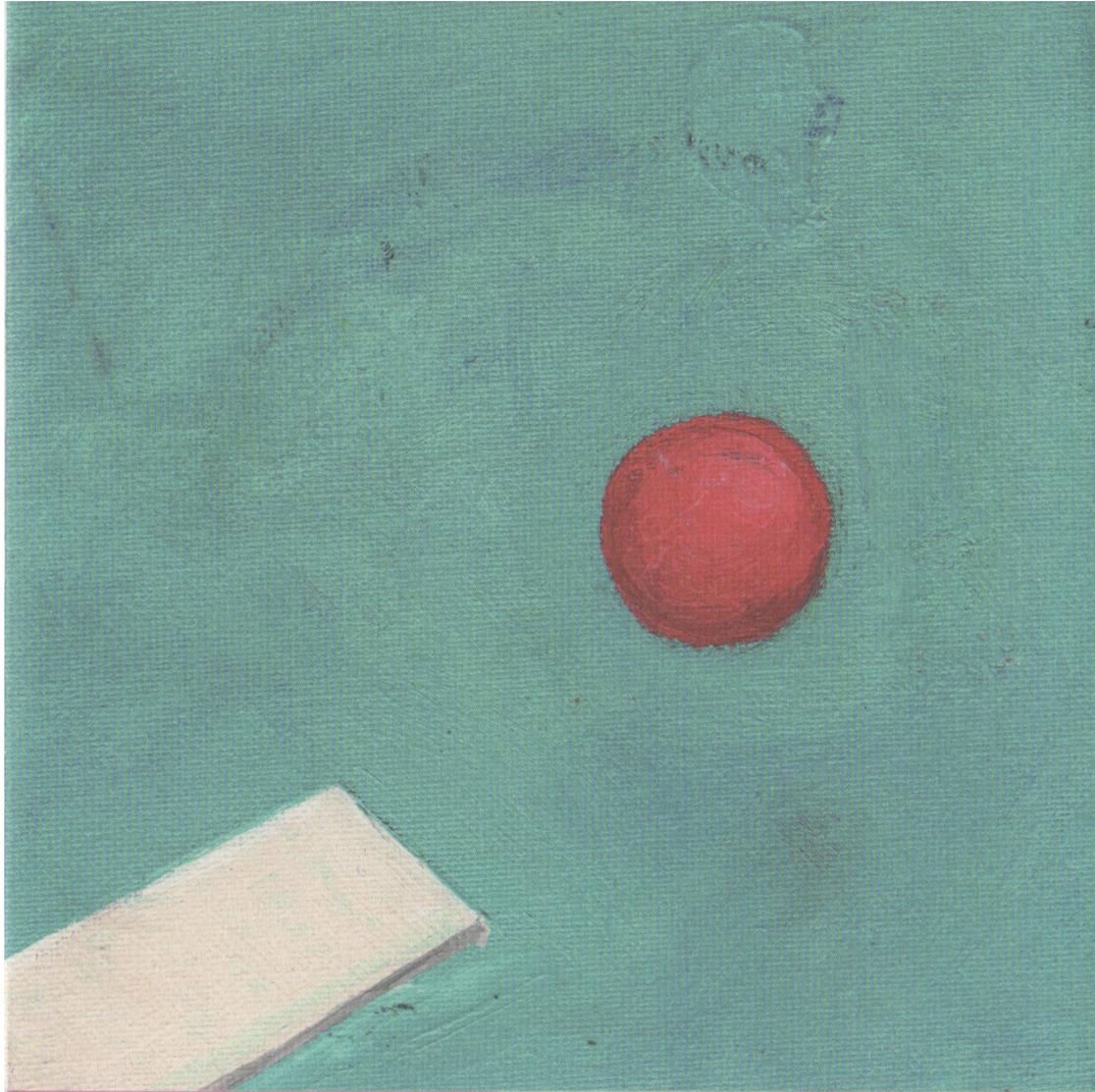


Figure 45: Dutch Uncles - O Shudder, front cover

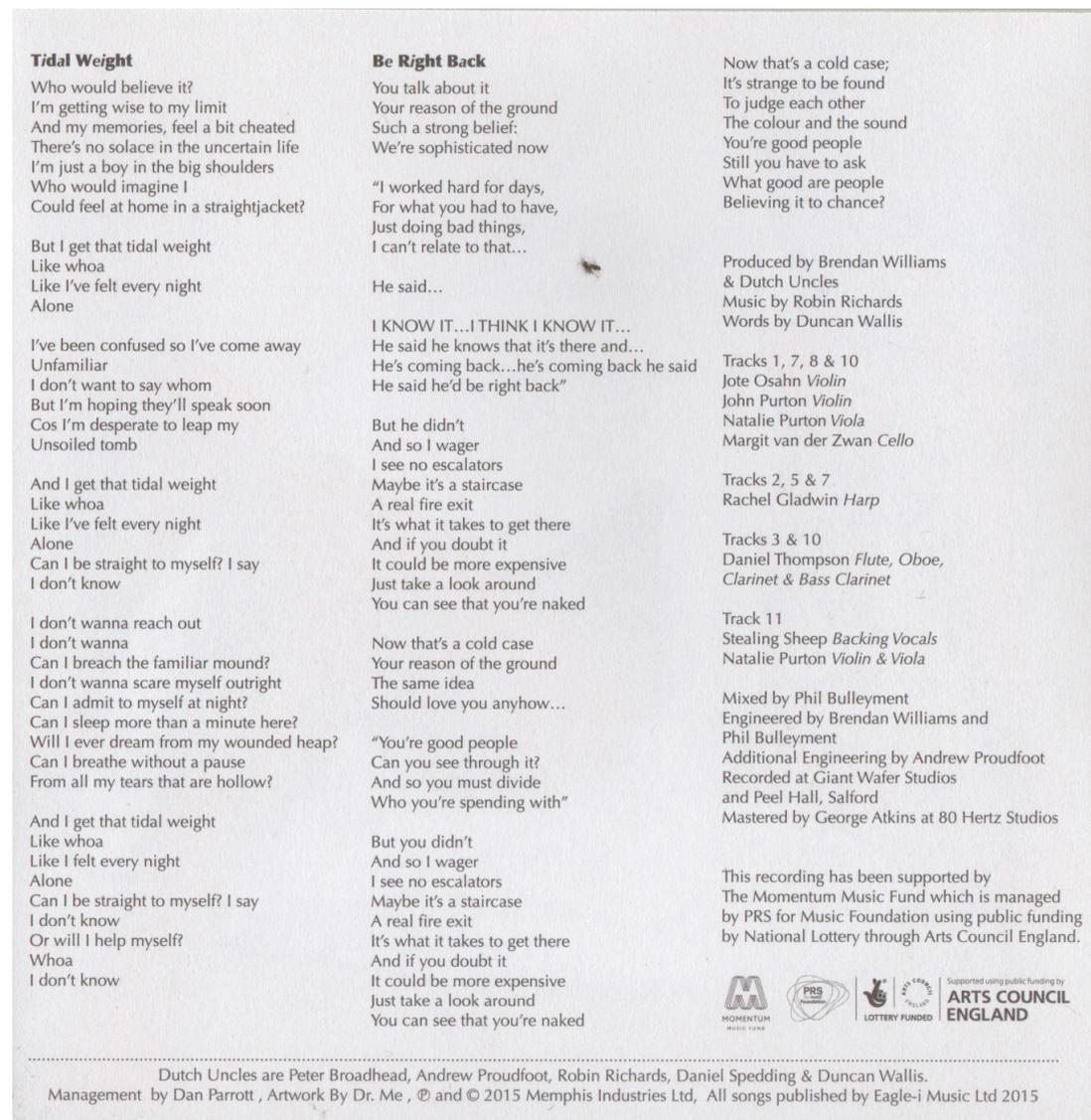


Figure 46: Dutch Uncles - O Shudder, back booklet

Following the success of *Out of Touch in the Wild* I was asked to produce the next Dutch Uncles album. Although it was not 'a given' that I would be approached, it was also not a surprise. We had by now left our studio / rehearsal space in central Manchester and moved to a much better (bigger, cheaper, and less noise from other bands) space above The Kings Arms in Salford (figure 47). I installed extensive acoustic treatment across two adjoining rooms and linked them together with a multicore. It was now my intention that this would become a home for myself and the band as we worked towards another release.



Figure 47: Building acoustic treatment at The Kings Arms, Salford 2014

We had continued to think about new material since the completion of *Out of Touch in the Wild* and new demo's were appearing regularly between the bands busy touring schedule. The first of which became *Accelerate*, which I will discuss in detail in this study.

There was very much a sense that as a unit we had creatively 'hit our stride', we were comfortable in each other's company, able to express our thoughts about new material (and its potential direction) honestly and openly. We were keen to continue working in a similar vein to the way in which we produced *Out of Touch...* but with a desire to investigate new aesthetic possibilities. In early 2014 we were informed that a joint Arts Council England and PRS Foundation bid, which the band's manager had applied for (the Momentum Music Fund) had been successful. The fund was designed to recognise UK talent by supporting particularly creative artists who had not yet fully broken in to the mainstream.

"The Momentum Music Fund offers grants of £5k-£15k for artists/bands to break through to the next level of their careers. Activities eligible for support include recording, touring and marketing" (PRS Foundation, 2016).

The money was useful, Robin had particularly enjoyed writing for strings on *Out of Touch in the Wild* and wanted to investigate ever more ambitious arrangements, including multiple woodwinds and harp. The funding would make this experimentation financially feasible as we would be able to work with (amongst others) the experienced ensemble who had played on the *Out of Touch in the Wild* tour. The string quintet who played on the album recording were all individually very talented musicians, but I felt that their ensemble performance was a little lacking. Recording their parts had been difficult, I knew that on some tracks a great deal of editing would be necessary to bring the performances up to scratch. Some of the string arrangements had been subsequently doubled with synthetic parts in order to 'mask' the performance issues and, whilst this created an interesting sound world, we were keen to capture more 'honest' performances from the outset this time around.

As well as expanding the acoustic elements present in this new record Robin was keen to use synthesisers earlier in his compositional process. By working closely with myself and Phil over the years he now had a good grasp of what was sonically possible through subtractive synthesis and what particular synth's he was drawn to for particular musical functions. As the demo's developed it seemed to me that a new compositional direction was emerging.

Dutch Uncles were, following their first release, known for their use of tightly interlocking 'minimalist inspired' electric guitar parts. *Out of Touch in the Wild* saw these parts gravitating towards tuned percussion and string instruments and it now appeared that Robin was writing parts of a similar nature for multiple synthesisers. As a result of these shifting roles the new string arrangements had become generally less rhythmically focussed, the writing was more idiomatic (given Robin's experience working with the instruments) and his harmonic language was becoming more adventurous. These new relationships are explored in track *Tidal Weight*.

Robin is an excellent bass player and he was now often writing lines which, in effect, became the melodic 'hook' of the song. *Be Right Back* is a good example of this approach to the instrument and also demonstrates a 'mallet like' use of synthesisers, which in this instance I instigated.

The three tracks mentioned thus far (*Accelerate*, *Tidal Weight* and *Be Right Back*) will form the bulk of this study. I will not go into as much technical depth as I have in the previous study as (for reasons which will become clear) some similar recording techniques were employed on key instrumentation to those of the previous record. This will allow me to discuss a greater number of songs. I will focus the discourse on my production decisions in order to exemplify my deep involvement with the record and draw attention to practice which was innovative and / or displayed an ability to implement contextually non-traditional techniques which I had developed through my work in diverse musical environments.

To ensure the record's success, I would have to pay close attention to the way in which we integrated the more 'classically oriented' parts with the band's traditional instrumentation and synthetic elements of the record. Whilst there was much precedent for bands including prominent string arrangements in their work I did not feel that we should draw from either the progressive rock canon, or that of the post-Oasis 'lad rock' which had rumbled through the UK indie scene in the 1990s and 2000s. There were in fact fewer discussions around direct musical influences, both sonically or compositionally. We were beginning to set our own agenda, buoyed by the success of our previous release. This was not an isolationist or arrogant position however, more a reflection of the fact that we were finding a sonic language which referenced our own output as much as anyone else's.

In terms of engineering challenges and aesthetic direction I was keen that acoustic strings, harps, woodwinds and mallets were presented in a more traditional (spacious) environment than the previous record. I had by this point been working regularly with the Manchester-based contemporary

classical ensemble Psappha, developing greater confidence in my acoustic capture in this context. I had recorded both established and new works in a number of different spaces. Sir Peter Maxwell Davies' *Eight Songs for a Mad King* had been recorded in the University of Salford's Digital Performance Lab (Davies, 2012), I engineered the session (with the BBC's Sam Phillips producing the recording) and 'Max' supervised. Kenneth Hesketh's *Forms entangled, shapes collided* (Hesketh, 2012) was again produced by Phillips and this time we recorded at 80Hz. Most relevant to the upcoming Dutch Uncles sessions however were a series of recordings I had both worked on directly and supervised. I ran recording sessions as part of an MA project at the university which were incorporated into live performances of Steve Reich's Double Sextet (a 'live' sextet play to a pre-recorded backing sextet) in Edinburgh and Manchester. These recordings had been made in Peel Hall and, given the piece's instrumentation (piano, strings, mallets, woodwinds), I knew that the space would produce excellent results and provide engaging counterpoint to the tightly controlled studio acoustics in which the other instrumentation on the forthcoming Dutch Uncles release would be recorded.

We began to discuss where we might record the band's parts for the new record and it was not long before we decided to return to Giant Wafer. I felt that although this might risk sonic repetition there was a compositional language emerging (and a diversity in instrumentation and production direction) which would successfully aesthetically differentiate this record from the previous. Following the release of *Out of Touch in the Wild* I had revisited Giant Wafer to make a record for Halsall's Gondwana Records with new signing GoGo Penguin (see part 3), I was technically confident in the facility and valued the isolation and concentration which the studio engendered. There was however a conscious effort made to avoid direct repetition of recording methodology and we put this philosophy into effect in the first O Shudder session in March 2014.

Be Right Back

The band had worked on a demo of *Be Right Back* (entitled 4.1 The Senator DEMO1 within Digital Assets) at our space in Salford and I knew that the track had real potential. We were planning on recording as much instrumentation as possible for two tracks in the first stint back at Giant Wafer, *Be Right Back* and *Upsilon*. We made the decision to work to a click / guide track on these sessions as the tightly interlocking rhythmic material would require total precision in order for the compositional intent to be clear.

Myself and the band worked on this first four-day session without Phil Bulleyment, he would join us as co-engineer for the following sessions in May and June 2014 and again mix the record.

Drums

We chose to place the drum kit in the dead room, but altered the microphone technique significantly from that of previous Dutch Uncles sessions (figure 48).



Figure 48: Overheads - Coles ribbon microphones positioned behind the player

I had experimented with Coles 4038 ribbon microphones on the top of the drum kit when working with Dutch Uncles at EVE studios for a Record Store Day release (Dutch Uncles, *Salve to the Atypical Rhythm*, 2011). The results were a little too dark and I generally preferred condenser microphones in this context, but Ed Lewis had installed a pair of excellent Pultec style valve equalisers at Giant Wafer, which lifted the high

frequencies very effectively without adding additional harsh harmonic content (figure 49). I had experimented with this pairing when recording GoGo Penguin the previous year, and after much movement and comparison opted to use a similar technique on this session (figure 50).



Figure 49: Pultec equalisers used to brighten the Coles ribbon microphones

In addition to this I placed a modified Peluso C12 condenser microphone directly over the top of the kit (figure 50), equidistant to the Coles to ensure phase coherence. It was my intention that this microphone could be used to add more high-frequency detail to the cymbals (if necessary) in the mix process. I also experimented with heavy saturation on this channel but opted to leave recording unaffected whilst recording, to allow for greater flexibility.



Figure 50: Peluso C12 above the drum kit

The most unusual decision we made was to use a Neumann u87a on the top of the snare drum (figure 51). I had not tried this before and I did not expect particularly usable results (expecting the microphone to be too bright), but I was impressed with the accuracy of the capture. The spill from the hi-hats was quite prominent in the microphone, but I decided that in the context of the overall capture that this was a compromise worth making. The snare drum itself was the same one I had used on *Fester*, with a different skin (heavily dampened with an 'O ring' and parcel tape). The rest of the drums were the studios own. I again tuned the kick and snare drum to function effectively within the harmonic context of the song.



Figure 51: Neumann U87a on the top of the snare drum with a Beyer 201 underneath

Whilst working on the microphone placement in the dead room I noticed that one of the adjoining isolation booths had a very interesting acoustic character, prominent in very low frequencies. I placed an omnidirectional AKG 414 BXLS in the space to capture the results. This microphone became an important part of the drum sound on O Shudder. Working with drums in small dead rooms can sometimes result in a lack of very low frequency capture, as this is usually a result of more distant microphone placement. Low frequencies generate long wavelengths which take time (equating to distance) to fully propagate.

A single Gefell M900 was placed in the hallway (figure 52) to capture its short complex reverberation (the door of the dead room was left open). By blending this signal with the spot microphones it was possible to achieve something closer to the character of a traditional 'room' microphone if necessary.



Figure 52: Gefell M900 (right) in the hallway

The microphone technique described above resulted in tangibly differentiated capture from that of *Out of Touch in the Wild* but, by virtue of using some of the same drums and cymbals, there was also a sense of sonic continuity. Whilst some of the microphones were varied from track to track (particularly to suit changes of the snare drum) this configuration stayed constant throughout the duration of the recording process, with the exception of two tracks which were recorded in the larger live room.

I will not detail this particular process here, although a stop frame video (4.2 GW Live Room Kit Setup.mov) is included in the digital assets. The video shows the use of the same microphone configuration described above.

Three further videos (4.3 kit build stop frame.mov, 4.4 kit mics up stop frame.mov, 4.5 kit cable stop frame.mov) detail the preparatory process of recording the drum track for *I Should Have Read*, again utilising similar techniques.

Bass Guitar

Once the drums were recorded and edited our attention turned to recording the bass guitar. I wanted the prominent melodic line to be central to the final mix presentation and spent a considerable amount of time working with Robin on amplifier, cabinet, pedal and instrument choices, before a series of experiments with microphone placement and dynamics processing took place. This preparatory process took around three hours.

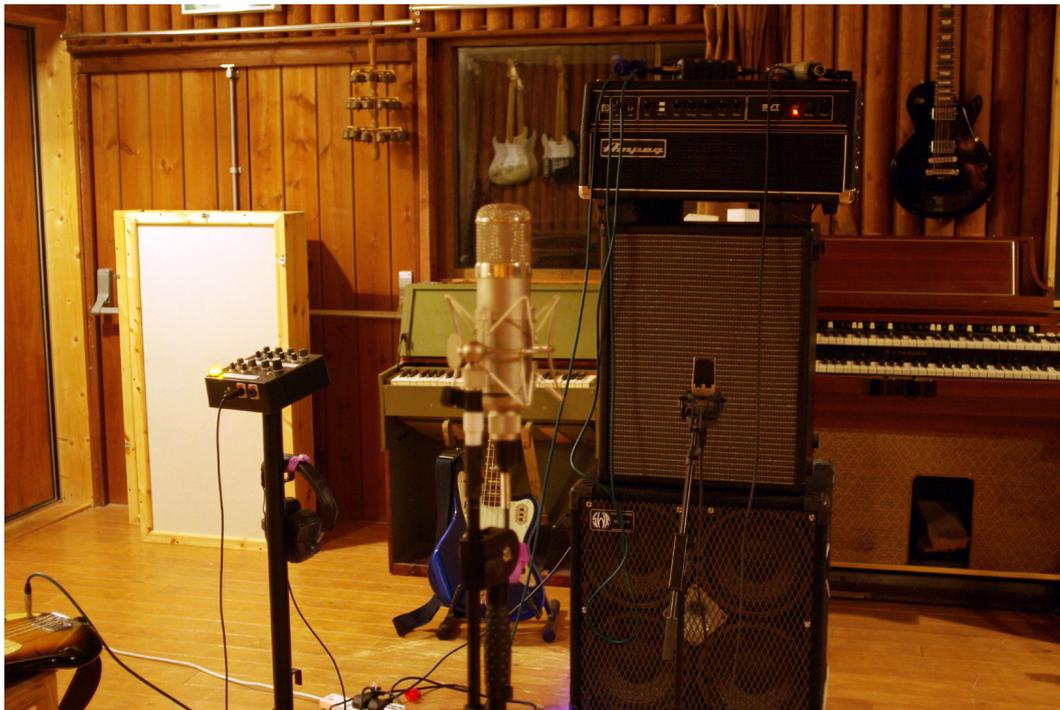


Figure 53: Bass guitar amplification and microphone technique - Be Right Back

We arrived at the configuration seen above (figure 53) with an Ampeg SVT Classic head feeding a 1 x 15 cabinet (the 4 x 10 was not used). Note the foam blocks between the head and cabinet, added to reduce audible vibrations in the amplifier head. More foam blocks and a concrete slab were placed underneath the 4 x 10 cabinet to decouple the cabinet from the floor and improve low frequency cohesion (figure 54). The main microphone is a cardioid AKG 414 with an omnidirectional FLEA 47 valve microphone capturing the room reverberation. We had previously used an LA2a clone to subtly compress the bass guitar whilst recording, but something slightly more aggressive was needed to help push the instrument to the front of the mix. After much experimentation, I arrived at

the use of a 'blue face' Urie 1176 Revision A clone. As well as controlling the dynamic range effectively this compressor had a distinct tonal characteristic; The very low bass frequencies were subtly attenuated and there was a noticeable boost between 1 – 4 KHz. As a result, the instrument needed very little further equalization.



Figure 54: Foam blocks and a concrete slab were used to decouple the cabinet from the floor, reducing vibrations

Synthesisers and Guitar Textures

Beyond the bass and drum parts there are some notable changes between the final arrangement of *Be Right Back* and the demo which the band had initially recorded. I suggested moving the demo's piano, koto and guitar lines to synthesisers and also suggested that the parts were simplified, leading to a decision to remove the piano line altogether. This created much more space for the vocal melody. I programmed a series of sounds using my Kawai K1 wavetable synthesiser and Dave Smith Tetra four voice subtractive synthesiser.

The K1 takes the first of the interlocking melodies, first entering at 0:01, the sound is constructed from two very similar patches - playing simultaneously, an octave apart - rich in inharmonic frequencies. The

Tetra enters at 0:32, weaving in and around the vocal line. I added a 'flute like' swelling pad (also programmed on the K1) at 0:46 at the end of the first verse to signify a transition to the pre-chorus.

The pre-chorus (0:48 – 1:04 "*I know it, I think I know it*") is a pivotal section of the song and I suggested removing all instrumentation other than drums and bass, to focus the listener's attention on the lyrics and increase tension before the chorus. In a session back at The Kings Arms myself and Peter Broadhead created some textural guitar loops for this section of the song using a Line 6 DL4 loop / delay pedal. A loop appears in the right channel at the start of the pre-chorus (0:48) and a half speed / octave down version, achieved by recording the texture to analogue 2 track tape and slowing the machine down from 15 to 7.5ips, gradually fades into the left channel (1:02).

Lead Vocal

We again used the FLEA 47 to record Duncan's vocal performance in Giant Wafer. Although A/B tests were conducted the microphone continued to come out 'on top' (figure 55). We did however decide to record Duncan performances in the larger live room and introduce a pair of distant microphones. The capture did not sound much livelier on the close microphone (it was still very intimate) but the room microphones gave us more options in terms of spatialisation. It was also nice for Duncan to have a different physical environment to perform in; there was a sense that he was glad to be out of the small and slightly oppressive dead room.



Figure 55: Close vocal microphone auditioning in live room

The vocal performance was recorded to the core instrumentation of drums, bass and synthesisers with additional parts appearing as ‘guides’ in the project. Duncan worked hard to perform with greater dynamic and sonic variation, which the live instrumentation would eventually support, in mind.

Strings

The string parts (violin and viola) featured on *Be Right Back* are distinct from all others on *O Shudder* in that they were overdubbed line-by-line at The Kings Arms (figure 56) by Natalie Purton (who played both instruments). Each of the lines was triple tracked and panned across the stereo field to create the illusion of a much larger string ensemble. We recorded the instruments with a wide-cardioid AKG C414 BXLS in the extremely absorbent rehearsal / recording space which I had constructed. I had by this point purchased some Classic Audio Products of Illinois VP26 pre-amplifiers (visible in figure 57, underneath the Korg MS20 mini) which were very similar to the ones we were using at Giant Wafer, in no small part chosen to enable me to match the character of recordings I was making between the two spaces.

Natalie is an excellent musician and Robin had scored the parts effectively, but in the session I felt that the final section of the track (which

was destined to be the last track on the album) lacked a little energy. This section had always had a strong disco influence (the demo featured some 'Nile Rogers-esque' rhythm guitar) and I suggested adding some similarly indebted tremolo string swells which mark important moments in the section. The swells reach a climax at 3:36 where upon Stealing Sheep re-enter the track.



Figure 56: The Kings Arms control room

Piano

The Piano fulfils a simple role in *Be Right Back*, doubling the first three notes of the bass line in the final section of the track (2:40). The majority of the piano parts on *O Shudder* were recorded in Peel Hall on the Steinway model B. A pair of cardioid Brauner Phanthera V microphones were placed in a spaced A/B configuration, covering the low and high sections of the frame, as seen in figure 57.



Figure 57: Recording the Steinway piano in Peel Hall

Backing Vocals

There had been many discussions regarding additional female backing vocals on *Be Right Back*. We felt that the final section of the song warranted a thickening of the vocal line, doubling Duncan's lead, and a further nod to the disco influences which Robin had been channelling. Dutch Uncles had been fans of the Liverpoolian band Stealing Sheep since the release of their first album *Into the Diamond Sun* (Stealing Sheep, 2012). The bands had met whilst on tour and Robin subsequently asked them if they would be interested in contributing a performance to the record.

Writing vocal harmonies and additional parts had long been my territory in this context and I was encouraged to see how we might also augment *Be Right Back's* sparse chorus, in order to differentiate it from the verse. I wrote a rather Motown inspired three-part harmony ahead of the band's arrival and, once there, listened to Emily, Becky and Lucy's range and tonality. With consultation we divided the parts between them, each vocal line was then double tracked. The vocal harmonies enter at 1:04 and although the arrangement sounds relatively straightforward there is a good deal of subtle variation, altering the harmonic relationships between the

synthesisers, voices and guitar parts. The chorus was also reinforced with a male voice (Andrew) an octave beneath Duncan.

Stealing Sheep re-enter the track prominently at 3:37, taking over the lead line from Duncan on the phrase “he’s coming back” and continuing his melodic line in unison until the end of the song, and indeed the end of the album. It was a great session (as visible in figure 58), a good time was had by all.



Figure 58: Stealing Sheep and Dutch Uncles

Further changes to the arrangement

The original demo had been sketched out by the band before Duncan had done any work on the vocal parts (as was normally the case). As mentioned previously, I had simplified some of the existing parts to create space for his content, but on completion of the vocal recording I made some further edits to the arrangement, primarily to support the voice. At 2:06 the arrangement was edited to unexpectedly stop, at the end of the phrase “who you spend it with...”, creating a moment of rhythmic uncertainty before the entry of the half time drum beat.

There is a fast (high register) guitar line in the track played by Daniel Spedding, first appearing at 1:15, predominantly in the left channel. This line had again been simplified from the original version to make a more space for the voice. This part appears in its original form in the demo at 1:31, where there are notes following the run (and preceding the next) which were removed. I worked with Daniel to adapt these 'missing' notes into the very distant, heavily reverberated guitar harmonics first heard in the final version (in the right channel) at 1:16. This left the compositional function of the original part 'intact' whilst making use of spatial processing to allow for the voice to be the focus of the arrangement.

There is a change of tempo in the final section of the track beginning at 2:40 (the track speeds up by 2bpm). I suggested this change in order to add a sense of urgency and 'live' performance energy to the arrangement. I had used similar techniques before, programming tempo changes into click / guide tracks to allow for a little rhythmic 'push and pull' when it seemed like the musicians wanted to naturally push the beat (often into a chorus), or sit back into a more reserved section of the arrangement. Working in this way also allowed me to control the tightly sequenced synthetic elements of the track effectively.

The most obvious alteration of the arrangement is the lack of the introduction (preceding the entry of the drum kit) on the final version. The proposed album seemed to have a lot of protracted introductions already and I felt that *Be Right Back* should 'get to the point' sooner. However, this section (eventually performed on electric guitars and synthesiser) did eventually re-appear, added to the end of the previous track *Tidal Weight* (3:38 – 3:59).

Percussion overdubs

I suggested that we add finger clicks to the the track, which enter at 1:36. Finger clicks have a different tonality to hand claps but also different

musical connotations. I realise that this seems a little flippant, but the reasoning for choosing finger clicks over hand claps was that we all felt that the clicks both sounded, and implied, something 'cooler' than hand claps. It takes less effort to click your fingers than clap your hands, there is something intrinsically lazy about a finger click, it represents a muted recognition of groove, a subtler form of appreciation. Myself and Duncan overdubbed the clicks together, recording the part with the FLEA 47.

I overdubbed a tambourine in the final section but the passage needed a further rhythmic 'lift'. The 'chopping' disco-inspired guitar (featured from 2:56 on the demo) was a step too far towards pastiche for my tastes and I had – with consultation – decided to omit it from the final version of the arrangement. However, this left something of a hole which I felt could be filled by percussion. I play congas fairly well but a traditional 'Cuban inspired' part again seemed like a step towards too 'retro' an aesthetic. I then assembled a selection of low pitched, carefully tuned tom toms, congas and wood blocks, which I played with sticks. This part becomes audible (fading in) at around 3:33 and gradually builds to full volume by around 4:23.

Tidal Weight

I had much less input in the shaping of the arrangement of *Tidal Weight* than the previously discussed song although I did contribute some details; a cymbal overdub and a series of dissonant guitar lines in the bridge (discussed later). What was central to the track's success however was my input in terms of the way we approached both the use of synthesis and the integration of string quartet and flute in the arrangement.

Synthesisers

Whilst working on *Out of Touch in the Wild* I had at points become frustrated with the amount of time we were spending on 'revisiting' certain synthesiser sounds, particularly when we were in the process of

overdubbing multiple synthetic parts. It seemed to me that the problem was analogous to the issues one can come across in a traditional band overdubbing session, carried out before each performer had 'settled' on their own particular tone.

When capturing a typical band performance comprising drums, bass, guitars and piano for example, it is often the case that an engineer / producer will initially have the band play simultaneously (even if they intend to capture the parts individually) in order to shape individual sounds. This technique might help them to progress towards an understanding of the overall sound world in context. For example, one guitar part might suggest a particular tonal treatment, which will influence the tone of the other, this process of comparison and adjustment will happen throughout the instrumentation as a whole, until the sounds function effectively with each other. If there is no clear understanding of the overall sound world you are trying to capture then one is sometimes required to revisit certain parts of the arrangement (for tonal reasons) further down the line, if you do not get it 'right' the first time.

I wanted to work with synthesisers on the O Shudder sessions in a way which allowed for multiple units to be triggered via a MIDI interface simultaneously, this would also allow for quick comparison of an instrument's suitability. I would be able to shape multiple sounds in context (as outlined above) rather than overdubbing the synthesisers one at a time as we had done previously. I built a system capable of this using a MOTU Micro Express 4 input / 6 output interface. Each synthesiser's output was plugged directly into the line inputs of the Speck LiLo mixing console, from here we were able to route signals into the computer and also to various reverberation units. This system stayed in situ for the two long sessions in May and June 2014. When working on material with prominent multiple synthesizer parts we were now able to begin shaping the sounds even whilst considering drum microphone placement or bass guitar sounds. The system can be seen in use in the video clip 4.6 Tidal Weight Synth_2.mov. After a process of comparison, we had arrived at a pairing

of the Dave Smith Tetra playing the polyphonic part and the Korg MS20 Mini providing the monophonic bass line. These signals were sent to a Great British Spring Reverb and a Master Room spring reverb. These synth's were left running whilst we experimented with guitar sounds; the video clip 4.7 Tidal Weight Guitars.mov shows Peter working on his guitar part after considering instrument selection, pick up and pedal choice with the synths running via MIDI. Only when the core instrumentation was complete and edited did we commit the synth sounds to hard disk, at this point certain parameters of the synthesisers were manipulated in real time to subtly vary timbre and tuning.

String Quartet

Tidal weight features a prominent string quartet arrangement. All of the quartet arrangements were recorded in Peel Hall in July 2014, along with tuned percussion and woodwind parts.

We took a location kit to the hall and established a makeshift control in a back-stage dressing room. My microphone pre-amplifiers, audio interface and monitors were arranged in the space along with a computer running the pro tools sessions (figure 59).



Figure 59: Control room in Peel Hall

A large multicore linked this room to the hall and headphone amplifiers provided cues to the musicians.



Figure 60: String Quartet microphone placement

I set up a microphone array in which two ORTF pairs (Brauner Phanthera Vs and SE Electronics Titans) were arranged on the same stand, in order to choose the microphones which best represented the quartet performances for particular songs. The SE Electronics Titan's were possibly more accurate, but the presence peak inherent in the Brauner's helped the quartet to cut through denser arrangements. Each instrument was also covered with a spot microphone. AKG C414 BXLSs were placed on the violins and viola whilst a BLUE Baby Bottle was used to capture the cello (figure 60). We worked hard to achieve solid phase coherence between the main array and spot microphones and were very happy with the results which we were hearing.

The hall's long, lower middle frequency focussed, reverberation supported the quartet extremely well and provided a counterpoint to both the mechanical reverberation employed on the synthesisers and the very dry presentation of the guitars and voice. There is a sense of three separate acoustic environments co-existing effectively.

A Flute part was overdubbed by Danny Thompson at a later date, first audible at 1:24. Whilst the flute is a small part of *Tidal Weight* Danny's contribution was central to *Drips* which was recorded in the same session. Figure 61 illustrates this session, with four different seating positions and four different microphones (along with room microphones) employed to create the sense of a large ensemble performance at mixdown.



Figure 61: Danny Thompson recording multiple woodwind instruments for *Drips*

Tidal Weight's bridge section (1:56 – 2:47) was augmented with fretless bass, cymbals (treated with reverberation and delay), Robin's deep baritone and Andy's alto voices and some dissonant guitar groans and squawks which I contributed.

Realising *Tidal Weight* was a long and involved process, recorded in multiple environments over a three-month period. We could have opted to simplify the job significantly but choosing to work in Peel Hall added an engaging layer to the tracks sense of spatial depth. The production aesthetic which I helped to shape supports the introspective and searching lyrical content, I am very proud of what we achieved in this offering.

Accelerate

Accelerate was the first track which emerged in the writing process leading up to the recording of *O Shudder*. This short study does not aim to discuss all of the tracks constituent elements (of which there are many) but illustrates a process whereupon I became largely responsible for the form of songs final presentation, though many revisions of the original compositional framework.

Moving towards a final mix we jokingly referred to *Accelerate* as a 'remix of a remix', for reasons which will become clear.

The original demo which the band produced (4.8 Tubas DEMO.mp3) is a rather 'summery' affair. I was not immediately engaged by the entirety of the track, it was one of many demo's which were in circulation at the time but the band had marked it for inclusion on the album. I worked with them to develop the demo and began to like it more and more. I felt that Duncan's vocal part was strong and there were sections of the arrangement which worked very well, particularly the section between 1:58 – 2:11 on the second iteration of the demo, 4.9 Tubas (Accelerate) Demo 6.mp3.

But the arrangement still lacked focus, it was interesting but 'blocky', moving between quite disparate sections with little in the way of bridging harmony. However, although I felt that the arrangement needed further work, we did decide to record a drum part whilst at Giant Wafer in April.

Preceding this session I had suggested a number of key changes to the track which were worked into the demo forming a template for the session. The original chorus' guitar parts had been replaced by a less strident muted guitar part which I had written (audible between 0:35 - 0:57 in the first chorus of the final version of *Accelerate*). I had also written a new drum beat (tom-tom heavy, pinning down sixteenths) for the chorus and with Robin's input two new bass lines had emerged. The recording of these new bass parts is captured in the video clip '4.10 Accelerate New Bass Parts.mov', the new drum beat is also audible. A lot of work went into this beat, including some hardware delay processing as seen in the video clip '4.11 Accelerate Delay Snares.mov' The bass line which forms a central part of the introduction to the track was also doubled with an electric sitar, audible at 0:25 on *Accelerate*. The harmony underpinning the original demo's introduction was now replaced with a synthesiser part which echoed the original marimba line. Whilst all was shifting around it,

Duncan's vocal parts remained largely intact; the new parts which we were writing were given a harmonic framework by this existing melodic content. More work followed in Wales; we moved the demo's marimba lines to synthesisers (appearing in the first chorus, albeit subtly) and formalised some of the other synthetic parts. I also contributed a technique which I had borrowed from Karlheinz Stockhausen: at 0:34 (*Accelerate*) you can hear the sound of a microphone being 'swept' at close proximity (around 5cm) across a resonating cymbal. I also suggested inserting a 5/4 bar, to throw the listener 'off guard' a little before the entry of the first chorus. The band commented that the sound was "like someone landing a spaceship", a protracted argument ensued about exactly how and where said spaceship should land.

Back at the Kings Arms we were more confident that the track was finally coming together, but I felt that the chorus was now potentially too busy (particularly in the high frequencies), detracting from Duncan's vocal line. Over the course of a long evening I re-imagined the drum beat, cutting out bass and snare drum hits from the recordings made in Wales and sequencing a new rhythm with these acoustic elements augmented by electronically generated tom toms and a new ride cymbal pattern. I was very pleased with the results but to be honest I did not expect the band to take kindly to yet another change. Fortunately, the next day the idea was met with mass approval, Duncan then wrote new parts, interjecting between the original lines "They don't want you, like I want you" and the arrangement was all but complete. The final parts which I contributed are the very fast – randomly arpeggiated – synthesizer parts which creep into the arrangement from around 2:46, reaching a climax at the end of the track and cutting abruptly on the word "gone".

Accelerate is perhaps the most synthetically oriented track which Dutch Uncles have released to date. The fact that I was often left alone to work on important elements of *O Shudder* demonstrates the multifaceted nature of contemporaneous co-creation. I have very recently completed a fourth album with the Band (*Big Balloon*, due for a release in February 2017)

where my role – by mutual agreement – was more limited. It is a markedly different record in terms of production aesthetics.

Reception

The reviews of the record were very positive, it was interesting to see new publications getting behind the band (The Guardian had never shown a great deal of interest before) and there was some good radio support in the form of spot plays. However, the radio playlists alluded us (the first single made the BBC 6 Music Rebel Playlist, but that was the extent of it). In period of web based music distribution and consumption it is easy to underestimate just how important traditional radio airplay still is for a band. The venues booked for a tour are often directly influenced by whether a single has reached a playlist or not.

Despite this setback the band went on to play some of their biggest UK headline shows to date; at Manchester's Ritz and the London's Koko. The band were then asked to support Butch Vig's Garbage on the European leg of the 20 Years Queer tour.

NME (Dan Stubbs)

Something strange happened to Dutch Uncles after the release of 2013's coming-of-age album 'Out Of Touch In The Wild': they received the patronage of emo-pop powerhouse Paramore, who took them out on a huge European tour and – in theory – introduced them to legions of potential new fans. For a band whose elegant, uplifting pop – think Field Music crossed with Prince – has been cruelly overlooked for far too long, this was definitely the makings of a 'big break'.

So, depending on your standpoint as regards selling out and cashing in, you'll either be baffled or delighted to discover that they've adjusted their modus operandi not one jot on the follow-up, 'O Shudder'. There are no big choruses or emo-friendly sentiments for the Paramore fans. Instead, the Manchester-based quintet draw fresh sculptures from the blueprint

created for ‘...Wild’, keeping intact its bouncy, airy feel, intellectual-sounding song titles (hello, ‘Upsilon’) and lyrics that seem to view human relationships through the lens of an anthropologist rather than a participant. Even the sticky subject of sex – presumably the topic of opener ‘Babymaking’ – inspires the kind of neat, clinically clean, robotically perfect song that could soundtrack an Open University film on fractional distillation... (Stubbs, www.nme.com, 2015)

The Guardian (Harriet Gibsone)

Manchester’s Dutch Uncles allow the angst of adolescence to seep through to the “right side of 25” on an album preoccupied with sex, social media and self-prescribed health checks. Articulating the innermost thoughts of its suburban male protagonist, Duncan Wallis’s nervous, fluttering falsetto is backed by graceful orchestration and delicately plucked minimalism, finding surreal beauty amid the awkwardness. Although their previous albums were rich in angular indie, this fourth sees the best realisation of their ambitions yet: there’s an alien romance to the Kate Bush-borrowing Babymaking; single In N Out lists sexual intentions with a disgusted fascination; Decided Knowledge has a Tears for Fears-style pomp; and Drips is built around the call and response of two oboes, which proves surprisingly mellifluous. Dutch Uncles may be indebted to the 80s, but O Shudder paints a portrait of a very modern man, and establishes them as masters at sculpting an atmosphere of unease. (Gibsone, 2015)

Pitchfork (Jazz Monroe)

...If Wallis’ exhortations find solace, it’s in the backdrop’s orchestral splendour, a complex lattice of woodwind, strings, percussion, and marimba that winds up feeling improbably cosy and lived-in. The band’s secret weapon is Robin Richards, their composer and bassist, and his handiwork here glistens, ranging from elegantly odd curiosities (“Babymaking”, “Drips”) to obscenely lovely mini-symphonies (“I Should Have Read”, “Given Thing”). On the livelier “Upsilon” and “Don’t Sit Back (Frankie Said)”, Dutch Uncles defibrillate third- or fourth-hand R&B with

twinkly synths and piston bass pops, signposting the sort of disjointed grooves by Japan and Talking Heads that might've soundtracked their parents' own baby-making. (Monroe, 2015)

Part 3: Shaping the Jazz Aesthetic – Acoustic Electronica

This chapter centres on the synthesis of techniques used in seemingly disparate record-making cultures in order to address how emerging musical forms might be best represented on record. Part 1 deals with a period spent trying to re-create recording environments and utilise techniques which reflected practice developed in the 1950s and 1960s in the field of jazz recording. As detailed, the recordings of this period have become aesthetic reference points in the genre. This study exemplifies how the participants drew from practice (compositional, performative and technical) more readily associated with electronic, rock, contemporary classical and electro-acoustic music, in order further develop the language of recorded contemporary jazz.

In the spring of 2013 I was extremely busy, juggling multiple projects on various established labels with a full time academic position. Matthew Halsall had recently released an album by the Manchester-based trio GoGo Penguin *Fanfares* (GoGo Penguin, Fanfares, 2012). The trio comprises Chris Illingworth on acoustic piano, Nick Blacka (who replaced Grant Russell) on double bass and Rob Turner on Drums. At the point of signing the band the original line up were part way through the process of self-funding the record at The Lodge, a studio in Northampton. The album was well received and Halsall approached me to work on a follow up, I was by this point regarded as something like a 'staff engineer' at the label. The band drew inspiration from multiple sources, whilst they were regarded in the press as a jazz trio the band cited an eclectic raft of influences. This brief interview for M Magazine summarises the band's thoughts about their work at the time.

We first started writing music because...

We started writing the kind of music that we wanted to hear because nobody else seemed to be doing it. We also wanted to experience the

composition, arranging and performance process not just individually but together as a band.

We have been making music since...

For approximately two and a half years.

Our music is...

Acoustic-electronica. We did an interview in Istanbul recently and that's how the interviewer defined our music. We quite liked it and thought 'we'll keep that'.

You'll like our music if you listen to...

Aphex Twin, Esbjorn Svensson, Bad Plus, Squarepusher

Our dream collaboration would be...

Thom Yorke, Bjork, Brian Eno

If we weren't making music we'd be...

Unemployed.

(M Magazine, 2013)

Whilst Halsall had asked me directly to work on the record I felt that it was appropriate to involve Joe Reiser, my former MA student. Joe had shadowed and assisted me on various recording projects (including the Psappa recordings mentioned in Part 2) and had begun to work with GoGo Penguin as their front of house engineer. Through this association he got to know the band's new material very well (working on some speculative recordings to aid the compositional process) and I felt that Joe would be able to make a valuable contribution to the project, he had in effect been involved in significant pre-

production. We did not feel the need to formalise this arrangement at the time however, we were going to make a record together and would iron out the details regarding credits at a later date.

Given the band's influences I felt that we should consider the proposed record's aesthetic direction carefully from the outset of the project. It seemed to me – and this was confirmed through multiple discussions with the band – that presenting GoGo Penguin in a similar way to some of the earlier releases I had recorded for Gondwana was inappropriate. This music was not pertaining to recapture or even reference the 'golden era' of jazz, presenting them in a space akin to Van Gelder Studios (for example) would have been at odds with their desires for many reasons.

The band often played their instruments with a good deal of force, attempting to achieve adequate separation (using traditional microphone placements) in a space like Peel Hall would have only resulted in disappointment. We might have chosen to use microphone technique akin to an on-stage arrangement; very close microphone technique on the drum kit; piano microphones installed under the closed lid of the instrument and a reliance on the bass's piezo pickup. This methodology was rejected quickly as (alongside resulting in a form of capture which I generally do not like) the hall's reverberation was also largely inappropriate for the music. There were moments in the proposed material which might have been supported by a long natural reverberation, but the vast majority of the tracks would have suffered in such an acoustic, the reverberation would simply have blurred definition between the instruments.

Having had a successful experience at Giant Wafer studios recording the Dutch Uncles' *Out of Touch in the Wild*, I proposed that we work on the project there. This suggestion might seem at odds with some of the methodology discussed in Part 1 (where in the context of a jazz ensemble recording I sought to create an 'as-live' self-balancing acoustic environment), but the fact of the matter was that, whilst GoGo Penguin might have been considered to exist within the lineage of the jazz trio, they were not bound to the idea of that particular type of traditional aesthetic presentation. We had discussed ways of processing their

instruments with techniques drawn from electronic music production, and for this we would require significant separation of sound sources. Through involvement with other ensembles the band were all experienced in 'pop' recording techniques; they were comfortable wearing headphones as long as line of sight remained in order to engender effective improvisation. The crux of this decision however (to move away from a traditional form of jazz recording) was that in many respects it represented a more honest presentation. The band simply did not self-balance in a traditional sense. For the band to be experienced live (in the way they intended the compositions to be heard) they required at the very least that the piano and bass be amplified to retain detail alongside the drum kit. Most of the time the band did want their instruments to sound 'natural' (representative of their acoustic state) but they also desired the separation afforded by the modern recording studio environment. Giant Wafer offered all of this.

Halsall was initially reluctant, this suggestion felt like something of a gamble for him (he had not worked in the studio himself) and I think he was unsure of exactly how much direct input he wanted to have on the record. Matt had had a lot of discussion with the band regarding material to be included on the record and the geographic isolation which Wales afforded was not necessarily his preference, from a practical point of view. Matt was also a little apprehensive about spending a lot of money on this relatively new project. I felt strongly that this was the right decision however, and effectively 'waived' my fee on agreement that we would use the extra funds to make the record in Wales.

Output 5: GoGo Penguin – V2.0

(GoGo Penguin, V2.0, 2014)



Figure 62: GoGo Penguin - V2.0, front cover

The V2.0 recordings sessions began on 31st March 2013. We had arranged to hire a five-foot Kawai grand piano which was delivered to the studio and left to acclimatise ahead of our visit. The schedule was very tight, we would arrive around midday, use the remainder of that day to set up the recording equipment and then have two and a half full days of recording before the band flew to Turkey to play at a festival. Once at the studio we set to work quickly, first listening to the piano (which Chris Illingworth was very pleased with) and then planning the room arrangement and microphone technique.

Our guiding principles in terms of engineering methodology were that we would try to capture each instrument as honestly as possible (achieving as much separation as we could) with the detail and precision afforded by contemporary multi-microphone techniques. We did not have pre-defined reference points which we sought to emulate, but some references did emerge and were largely used to judge our capture in terms of frequency balance and dynamic range. I had brought a wallet of CD's containing material I knew intimately to the session, as I always do. Most useful was the Mahavishnu Orchestra's 1971 release *The Inner Mounting Flame* (Mahavishnu Orchestra, 1971). The record presented a jazz rock fusion group in a very dry environment. Listening on the studios' large ATC monitors it was clear what a great recording this was. Although it was not preconceived, this album's drum sound in particular did become a reference point of sorts whilst working on the GoGo Penguin tracks. Billy Cobham often hit the drums with a similar force to Rob, the recordings captured the dynamism of the performance accurately, revealing the complexity within the performances and the timbral variety Cobham achieved through great attention to detail in the tuning and arrangement of his instruments.

The table below details the microphone technique for all instruments and channel information relating to real time processing.

Microphone Technique / Real Time Effects Processing

Instrument	Microphone / Processing	Polar Pattern	Position
Bass Drum In	Sennheiser MD421	Hyper-Cardioid	Inside Drum
Bass Drum Out	BLUE Mouse	Cardioid	15cm from back skin
Snare Top	Josephson E22s	Cardioid	10cm from top skin
Snare Bottom	Shure SM57	Hyper-Cardioid	10cm from bottom skin

High Tom	Sennheiser MD421	Hyper-Cardioid	15cm from top skin
Low Tom	Sennheiser MD421	Hyper-Cardioid	15cm from top skin
Overhead Left	Coles 4038	Bi-Directional	Low, right of kit
Overhead Right	Coles 4038	Bi-Directional	High, left of kit
Extra 'floating' mic	Beyer M160	Bi-Directional	Extra snares / percussion.
Pearl Syncussion	n/a	n/a	n/a
Corridor	Gefell M900	Cardioid	Between the drum Booth and live Room
Bass Close	Earthworks M23	Omnidirectional	Clamped to body – under strings
Bass Distant	FLEA 47	Cardioid	40cm from bridge
Bass DI Pre FX	Radial JDI	n/a	n/a
Bass DI Post FX	Radial JDI	n/a	n/a
Piano Pair 1 Left	SE Electronics Titan	Cardioid	60cm from strings - ORTF
Piano Pair 1 Right	SE Electronics Titan	Cardioid	60cm from strings - ORTF
Piano Pair 2 Left	Royer 121	Bi-Directional	100cm from strings – Spaced A/B
Piano Pair 2 Right	Royer 121	Bi-Directional	100cm from strings – Spaced A/B
Piano Pair 3 Left	Schoeps CM6 (Mk4)	Cardioid	100cm from strings – Spaced A/B
Piano Pair 3 Right	Schoeps CM6 (Mk4)	Cardioid	100cm from strings – Spaced A/B
Piano Reverb L	Great British Spring	n/a	n/a
Piano Reverb R	Great British Spring	n/a	n/a

Snare Reverb	AKG BX10	n/a	n/a
Pedal Board	Multiple guitar Pedals	n/a	n/a
Parallel Drum Saturation L	Ridge Farm Boiler / Anamod Tape Simulator	n/a	n/a
Parallel Drum Saturation R	Ridge Farm Boiler / Anamod Tape Simulator	n/a	n/a

Room Arrangement

We quickly arrived at a configuration which would allow for clear line of sight between all players and maximum separation. Figure 63 illustrates the final positioning of instruments and players. The bass microphones were separated from the piano with large modular baffles and Rob was positioned in the isolated 'dead room'. Whilst there was still some spill between the piano and bass microphones we felt that the attenuation was sufficient.



Figure 63: GoGo Penguin - Arrangement of room

Drums

Rob Turner is a technically frightening and highly experienced drummer, but I think it is fair to say that at the time (and I'm sure he would concur with this) his knowledge of drum tuning was a little patchy. It was not that he lacked the ability make a drum sound the way he wanted it to, more that it took him a long time, and that he did not really have a repeatable technical strategy for achieving his aims. I worked with him to solidify the tuning of the core elements of the kit (bass drum and tom-toms) and we earmarked and prepared a number of snare drums which we thought might be used on various tracks (they would be alternated regularly through the course of the recording process). Once the instruments were sounding well-balanced we began to audition microphones. I will not go into complete detail regarding this process (my general rationale regarding placement and microphone choice in this context is discussed in depth in the previous studies) but the process of choosing the overhead microphones does warrant investigation. It quickly became apparent that Rob played with real force at some points, in order to support the compositional intensity of the pieces. When doing so many of our first overhead microphone experiments started to sound questionable. We had first tried traditional A/B placements over the top of the kit with a number of models which had previously produced good results on other sessions (Geffel M900s, AKG 414s for example), but in the louder passages of performances the size of the room began to present itself in the capture. The results sounded 'boxy'; there was a proliferation of middle frequency focussed reflections despite the room's extensive acoustic treatment. Eventually we tried a pair of Coles 4038 ribbon microphones.

As mentioned in Part 2, I had used these microphones before and their dark, middle frequency focussed (with subtle brightening from an API 5500 stereo equalizer) character suited the instrument. However, the rear lobes of the bi-directional polar pattern were problematic in a traditional A/B placement, as they picked up the reflections from the ceiling. I suggested moving the microphones behind Rob, positioned at circa 90 degrees to the drums (which sounded a little better) and then in front of the kit (which sounded better still). The deep nulls of

the bi-directional polar pattern were helping to attenuate the sound of the small room by effectively 'ignoring' reflections from the ceiling, we reduced audible reflections from the walls using a pair of large baffles. We then experimented with the height of the microphones (keeping them both equidistant from the snare drum to maintain a balanced stereo image) and found the position illustrated in figure 64. The Coles 4038s can be seen in the bottom left and centre top of the image. We settled on a height for each microphone which was far from conventional; standard practice dictates that overhead microphones are generally placed at similar heights. Our arrangement was something of a 'hotch-potch', a hybrid of techniques, but the results were engaging and the positions were phase coherent with the close microphones. We questioned our findings for a long time, but could not think of any rational reason not to proceed with this arrangement, as the kit sounded really good.



Figure 64: Drum microphone placement

After a further period spent adjusting the polarity of close microphones to achieve as much phase coherence as possible, we moved our attention to the piano.

Piano

The instrument itself sounded rich and detailed although it lacked the very low end information one might expect to experience when listening to a full size concert grand. We experimented with the lid (half and full stick) and ultimately removed it entirely, finding that this produced the most engaging results and subtly lifted the low frequency information.

We listened to the instrument from all angles (figure 65) and began to place microphones in various configurations.



Figure 65: Listening to the piano ahead of microphone placement (Photos courtesy of Tom Leah)

We arrived at two pairs which both worked well (allowing for variation if necessary through the album) and positioned them above the piano in an A/B configuration (with phase coherence should we decide to create a mix of the two pairs). The Royer 121 ribbon microphones were interesting; they would not have provided the level of high frequency capture on their own which we desired but they had a (slightly compressed) solidity in the lower middle frequencies which none of the other microphones seemed to present in quite the same way. The Schoeps CM6s sounded extremely accurate as we had expected. These microphones worked very well in isolation, but also combined effectively with the Royers. We settled on this configuration, although at around 2am we became inquisitive, asking ourselves “can we make anything sound better?” A third pair of microphones (my SE Electronics Titans) were arranged at closer proximity to the instrument in an ORTF array. They sounded surprisingly good when A/Bing against the Schoeps, given the radical difference in price point.

Although the ORTF pair was not phase coherent with the A/B we decided to settle on this configuration (figure 66). If necessary, we would address the phase issues with sample delay in the mix down process.



Figure 66: Piano microphone technique

Bass

By this point I had a great deal of experience working with upright acoustic bass, I knew that we would use both a close microphone to capture detail and a distant microphone to engender a more traditional presentation. We quickly gravitated towards the FLEA 47 for the distant microphone. It sounded extremely good, as one would hope for a microphone costing circa £3,800 and we arrived at a placement around 40cm from the bridge of Nick's instrument (figure 67). The internal microphone required more consideration: after listening to my usual preferences we tried an Earthworks M23 omnidirectional condenser microphone, arranged to sit underneath the strings by mounting it in a 'luthier style' clamp (which Joe had brought along) attached to the body of the instrument. The microphone offered greater transparency than some of the dynamic models I had used in the past and (given the proximity of the instrument and heavy baffling) the spill from the piano was manageable. We also

recorded Nick's piezo pickup, both pre and post effects (Line 6 pedal board) processing. Nick's own effects sounded great but we also wanted the option to process the completely dry signal with some of the studio's equipment.



Figure 67: Bass microphone placement and pedal board

We auditioned various microphone pre-amplifiers on each source and ended up favouring those illustrated in figure 68. The (red) API style pre's sounded slightly more detailed and we used these on the A/B piano arrays, kick in, snare top and overheads (making up the main body of the drum sound). The dark blue and black amps were Neve derived (with a more saturated quality) and were used on the other sources.



Figure 68: Microphone preamplifiers - marked each mic / D.I

Spatialisation and Effects Processing

With the core of the trio's capture established we began to consider how we might present the band in terms of spatialisation. This process above all others defines the aesthetic character of V2.0. In this context, I define the term aesthetics as a discourse around our unprocessed, isolated recordings and the way in which we latterly chose to present them. Our recording methodology aimed primarily to capture sonic accuracy, whereas the aesthetic treatment was devised to shape the way in which the listener experienced the overall sound world and ultimately how they sub-consciously responded to the music. Edward Kealy, whilst discussing

'Small Entrepreneurs, Producers' of the 1950s, describes a period in recording history when new technology influenced the way in which ensembles might be presented to newly emerging audiences. The language is of its time, but the observations grapple with changing demographics and their shifting attitudes towards aesthetic 'accuracy'.

The entrepreneurs, independent studio owners, and mixers who worked for them did not have the resources in terms of studio facilities, musicians, and music to compete with the recording aesthetic of concert hall realism and high fidelity. However, their intended audience – lower class whites, blacks, and teen-agers – was neither expecting nor familiar with such an aesthetic...the use of echo and reverberation devices instead of cavernous studios, recording at loud volume levels, the use of novel microphone placements, electronically altering the acoustic sound's waveform, and various forms of tape editing in addition to the arrangements for music and new lyrics aimed at the lifestyle of its audience.

And what of the audience? There was no discussion between the key collaborators about the potential for commercially rewarding 'crossover' of audiences. We were making the record primarily for each other, in the hope that if we liked this combination of musical influences and aesthetic references, then somebody else might too. Hennion reflects on this, warning that making assumptions about one's audience is ultimately paradoxical.

The role of artistic directors is at once the most mysterious and the most characteristic. They claim to represent the public. "What about this representation? Do we have to accept their representivity?"; replies the critical observer. This is a misconceived question – I will stress this for the last time – since it presupposes a public that is already known,

one that can be compared with the image held by the artistic director, or at least one that is knowable outside the practice of production. But the public for a new record is by definition an unknown, something to be found, not something to recopy.

As discussed, I did not feel that attempting to place the band in a traditional large acoustic environment was appropriate. There was a consensus that we could reference some of the electronic artists who were of influence to the band by implementing less conventional reverberation and delay / modulation techniques used by some of the key artists they had mentioned in consultation. We were attempting, through the manipulation of aesthetic presentation to draw this 'jazz trio' closer to their 'non jazz' influences.

I am a long time Aphex Twin fan, having been introduced to his music at an early age. Rob was also particularly interested in his work. He described one of his rehearsal regimes as a student, stating that for weeks on end he attempted to learn and replicate (complete with approximated reverse snares and 'glitch' editing) all of the rhythms from Aphex Twin's *Drukqs* (Aphex Twin, *Drukqs*, 2001) and *Richard D James* (Aphex Twin, Richard D. James, 1996) releases. Aphex Twin often employs the use of prominent spring reverberation in his work (citing the use of both an AKG BX10 and an Allen organ spring reverb in liner notes). A spring reverberation has a notably different character to that of a physical architectural space: there is an inherent pre-delay (a short pause before the onset of audible reverberation) due to its design. This pause is interrupted by an audible 'boing', as the transducer shakes the spring into life. Spring reverberation also (very quickly) audibly modulates, in both volume and pitch, creating a shimmering reverberation tail. We had multiple spring reverbs at our disposal; my own Great British Spring (with a very long, circa four second, fixed reverberation), an AKG BX10 (the unit has some time variability, achieved through physical dampening of the spring) and Tchad Blake's Master Room spring (again, a long, fixed

reverberation time unit). In addition to these units there was a large selection of guitar pedals available in the studio, through which line level signals could be passed (after a reamplification unit addressed the required impedance conversion). We began experimenting with these multiple units and after a good deal of comparison arrived at a method for spatialising the instrumentation.

The piano was treated with my Great British Spring, providing a long reverberation tail. This processing is used on every track on V2.0.

The snare drum microphone was sent to the AKG BX10, adding a (pre-delayed) sense of metallic space to the instrument. This effect can be heard clearly at the start of the album's opening track *Murmuration*. On *The Letter* we also treated the entire drum mix with the Master Room unit. A definable 'boing' is generated by the side stick snare in the track *Kamaloka*, audible between 2:18 – 2:56.

The guitar pedal board was set up on an auxiliary send which could be accessed by any instrument. We employed the pedal board on many songs. *To Drown in You* features multi-tap delay and reverse reverberation throughout on the piano part, generated by an Eventide Space unit. The Bass part at the end of *Hopopono* (3:17 – 3:54) is treated with a heavy reverse delay effect, this time generated by Nick's own Line 6 pedal board.

All of this processing was made audible to the band whilst they played, it became both supportive of and integral to the performance.

The track which features the most prominent processing is *Shock and Awe*. This piece began as a sparse piano sketch which Rob had scored for Chris to play on the session. Under Rob's direction myself and Joe embarked on a process that was closer to studio-based composition than a traditional production / engineering role. The track features (amongst many other things):

- Improvised interference, crackles and hums generated by distorted 'bare' audio cables
- Loops generated from the above, created in my line 6 DL4
- The sound of me violently shunting the piano with the sustain pedal depressed to simulate the dropping of bombs
- A metronome was placed on the soundboard of the piano whilst five of us held down specific keys of the piano to allow the instrument to resonate sympathetically (in the key of the piece) with the metronome's pulses, as visible in figure 69.



Figure 69: Recording *Shock and Awe*

The entire mix of *Shock and Awe* (excluding the piano) was treated homogeneously with the GBS reverb in the mix-down process.

In addition to this extensive use of effects processing we also employed a Pearl Syncussion, dual oscillator drum synthesizer, on many of the tracks on V.20. Released in 1979 the Syncussion is an interesting unit, synonymous with the electronic, sinusoidal, descending tom-tom sounds often found in disco music. Any signal (provided it is strong enough) can be used to 'trigger' each of the oscillators, which are actually very flexible modules, offering many creative options. I constructed two synthetic sounds which were triggered by (and reinforced) the bass drum and the snare drum. We used this technique on a great deal of V2.0. The audio

clip '5.1 Murmuration Effects Mix.wav' exemplifies the use of both the Syncussion and many of the techniques discussed above.

The clip is a 'soloed' mix of all of the addition parts and processing which support the original acoustic instrumentation, In the final mix of *Murmuration* the listener is unlikely to be able to unpick the individual layers, but they are prominent and define the aesthetic presentation of the record.

The vast majority of V.20 was tracked in the relatively brief session at Giant Wafer and on completion there was a real sense of achievement between myself, Joe and the band. On return to Manchester the band were encouraged by Halsall to record some further tracks which they had chosen to omit from the session. It was not possible to return to Wales due to a lack of available time at Giant Wafer, which left us in a difficult position. The decision was taken to record this material in 80Hz and whilst the session was ultimately successful it was a stressful affair, which I shall not detail here. We worked very hard to match the capture we had achieved in Wales (utilising the same microphone choices and placement wherever possible) and two strong tracks did make the album: One Percent and Fort.

Mixing and Mastering

The album was mixed by myself and Joe over a protracted period in which the band thrashed out the album's order and final content with Halsall. We developed a mix template, using the same plug-ins and buss structure in order that our independently realised mixes would co-exist on the album seamlessly. There were many delays as the band and label struggled to reach a consensus and then – much to my frustration – we were given a very short deadline to finalise the mixes. Due to other commitments, I was only able to undertake completion of three of the mixes before the deadline. Subsequently we both attended a mastering session with George Atkins at 80hz and were very pleased with the final results.

Myself and Joe discussed credits ahead of the preparation of the album artwork and decided to split our descriptors equally, as co-producer / engineers. Whilst Joe had completed the majority of the mixes I had taken the lead to a degree (as a result of my previous experience in the facility) whilst we worked in Giant Wafer. We were both happy with this form of accreditation, feeling that it was both accurate and unfussy.

Reception

The record was well received; by this point Gondwana had developed a solid reputation and prominent reviews in respected publications were commonplace for releases on the label.

All About Jazz (Bruce Lindsay)

...v2.0 is the sound of a band moving forward—not in leaps and bounds, but in small steps. There's really no need to jump headlong into the unknown when the foundations set down on *Fanfares* were so strong. v2.0 builds on those foundations with style, further establishing GoGo Penguin as one of the most exciting young bands on the contemporary scene.

(Lindsay, 2014)

The album sold well within the sphere of the genre and the band played dates in both the UK and Europe throughout the year. Then in September 2014 I was frankly astonished to find out that the album had been nominated for the 2014 Mercury Music Prize. It is difficult to overstate what this nomination meant for the band. Record sales increased dramatically and the band were hastily slotted into an appearance on *Later With Jools Holland*.

The band then embarked on what was at the time their largest tour. As the record gained traction in territories outside the UK and Europe offers of further dates flooded in and the tour became more and more protracted, it

was humbling to see the record which we had recorded relatively quickly, in isolation, on a tight budget, reaching people all over the world. These developments and the reputation which the band were developing for engaging live performances eventually led to an offer of a recording contract with Blue Note Records, one of the world's most notable jazz labels.

Output 6: GoGo Penguin – Man Made Object



Figure 70: GoGo Penguin - Man Made Object, front cover

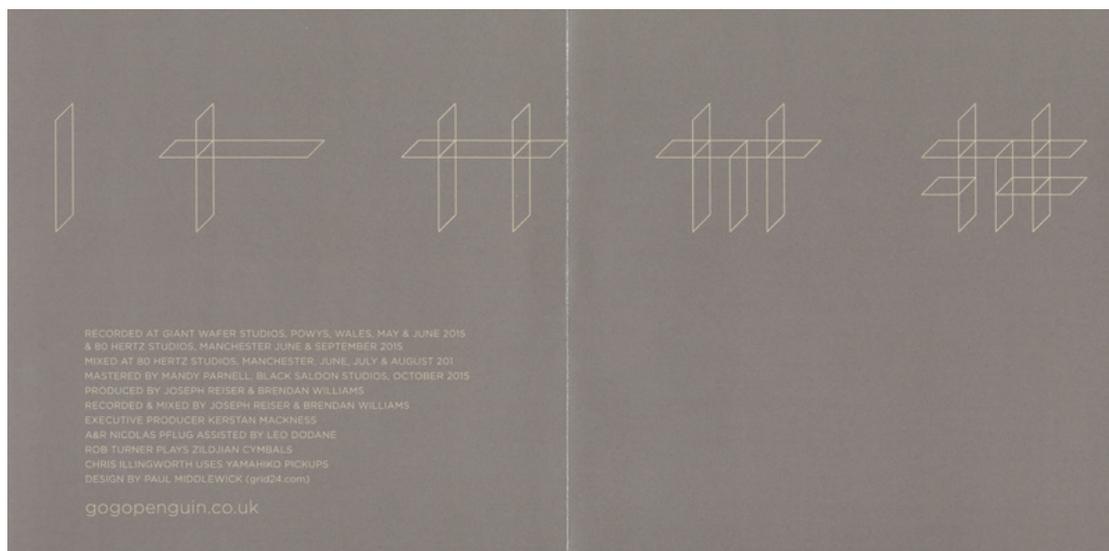


Figure 71: GoGo Penguin - Man Made Object, inside booklet

This short study will focus on how we achieved aesthetic differentiation between Man Made Object and V2.0, with particular attention devoted to innovative approaches to spatialisation. I will refer to microphone technique, but avoid repetition of a discourse around my general recording methodology, as this is detailed extensively elsewhere in the commentary.

Following the creatively rewarding session at Giant Wafer (and preceding the Mercury Music Prize nomination) GoGo Penguin had expressed a desire that we should work together again. After the band's move to Blue Note however the landscape was uncertain; Blue Note have autonomy to a degree, but they are ultimately a subsidiary of the major label Universal Music Group. I expected that the label would want to employ a seasoned producer and engineer to develop their new signing, but much to both mine and Joe's surprise the band fought our cause and the label agreed that we would produce a second record together.

The band were running on an incredibly busy schedule. In effect, they had not stopped touring for any considerable length of time since the Mercury nomination. This life of constant travel had a tangible effect on the compositional process of the band.

V2.0 had been written largely in a rehearsal room situation, with the band as a unit gradually developing each other's sketches into fully formed arrangements. This forum for writing had, over the course of the touring year, become much harder to organise and the compositional process leading towards a new recording had begun to be dominated by Rob Turner, who enjoyed composing in a DAW environment whilst 'on the road'. Through conversations with Rob I got the sense that whilst he was now writing and arranging with the band's instrumentation in mind, this had not necessarily been the case at the outset of the compositional process, and he had not always concerned himself greatly with the physical limitations of what was actually playable by human beings. His sketches seemed to be generally darker in their harmonic language than much of V2.0 and often denser in terms of texture. Many of the proposed tracks

were driven less by melody and instead focussed more on 'grooves' and repeated 'riff like' patterns. Some of the material was being performed live whilst the band toured and a playback of new material had been organised for Blue Note at Manchester's Band on The Wall venue. Joe was collating recorded material for me so that I could understand the arrangements fully before the recording took place.

It seemed clear to us that the new material had in many respects been born of the band's increasing exposure to technological potentials, the compositions were closer to what one might term Intelligent Dance Music from first iteration, due in no small part to the environment in which the writing process had taken place. This development in compositional language engendered discussions between myself and Joe as to how we might approach the aesthetic presentation of the new recordings. We developed a loose methodology for the forthcoming record:

- Little or no obviously synthetic reverberation
- No synthesizers
- Less obvious timbral processing of the drum kit
- A greater sense of natural performance space

These guiding principles supported the notion that whilst these compositions were designed with the aid of technology, they would be realised by human beings, they would become 'man made objects'. We also felt that this aesthetic direction might re-inforce a sense of the band's more jazz-oriented roots, in the context of a record due to be released on one of the world's most recognisable jazz labels. This creative rationale served a dual purpose; although we were not under any pressure to avoid such a situation, there was at the time a sense that we did not want to aesthetically alienate Blue Note's audience to date, too much.

We would not dogmatically enforce this rationale. There are moments – such as the climax of *Smarra* – where the use of extreme processing

would reach new heights, but we would actively strive to spatialise the record in a new way in order to differentiate this new record from the last.

Myself and Joe considered where we might make the record. There was a bigger budget available than that afforded on the previous album, but it was not endless by any stretch of the imagination. We considered recording at Peter Gabriel's Real World studios but eventually we decided to return to Giant Wafer and use the expanded budget to allow for much longer recording sessions. The expanded budget also meant that we could mix the record at 80Hz, having been particularly impressed with the honest and neutral acoustic properties of the control room whilst working on the previous album. Chris had also expressed a desire to record with a bigger piano, he had been able to play a wide range of instruments whilst on tour and developed a particular affection for the Yamaha C6. Joe organised for a hire company in Birmingham to deliver an instrument to Giant Wafer ahead of the session, which commenced on Saturday 30th May 2015.

Drum Kit Modifications

A facet of the aesthetic blueprint detailed above was our desire that we would try to avoid radical effects processing or synthetic reinforcement of the drum kit, as had been implemented extensively on V2.0. Over the course of the preceding year Rob had become ever more interested in applying substantial modification to his drums and cymbals 'at source'. We talked about this process with no ambiguity; his reference points whilst shaping the timbral response of his instrument were directly influenced by electronic music producers, with Aphex Twin, Fourtet and Gold Panda at the forefront of our discussions. Myself and Joe varied our close microphone technique track-by-track to capture these complex timbral results with as much detail as possible. This process is best demonstrated visually.

The video clip '6.1 Drums Branches Break GW.mov' shows Rob performing on a highly modified kit: Bells and seed pods are attached to

the hi hat stand, in his right hand he is holding two sticks, a shaker and a tin 'jingle' from an African djembe. Similar 'multi-stick' arrangements were used in other tracks, as illustrated in figure 72. The most elaborate treatment took place on the track *Quiet Mind*. Figure 73 illustrates the use of bells, seed pods, cymbals and temple gongs placed directly on drum skins. The image also shows our general microphone configuration and the use of further acoustic treatment, which we added to the drum room in order to attenuate audible close reflections.



Figure 72: Shakers, seed pods and stick in Rob Turner's right hand



Figure 73: Drum treatment - Quiet Mind

Myself and Joe's opinions were sought on exactly how Rob might modify his kit to suit a particular track. The video clip '6.2 Purple Double Stick GW.mov' shows the three of us working together to organise how Rob might utilise a double stick technique to play both hi-hats and a collection of metal strips. The track in question was not released as part of the album.

The drum recordings we began to make were sonically related to some of the material on V2.0 but we had used distinctly different methodology to arrive at this point. This 'modification at source' did not mean that the mixing process employed on Man Made Object would be any less involved, but we no longer regularly looked to drastic drum kit processing at this stage of the record's creation in order to shape its aesthetic character.

We approached the arrangement of the piano and bass in the live room in a similar way to that we had employed on V.20, with line of sight a first priority. There were however some notable changes in the way in which we approached the capture of these instruments.

Bass

Nick's bass had been well represented on V2.0 but we were keen to investigate new possibilities. We performed a microphone 'shoot-out' and now chose a Gefell UM900 for the distant capture and a Beyér M201 as the internal microphone, mounted in the bridge. Nick's newly fitted magnetic pick-up was used, instead of a more conventional piezo transducer.

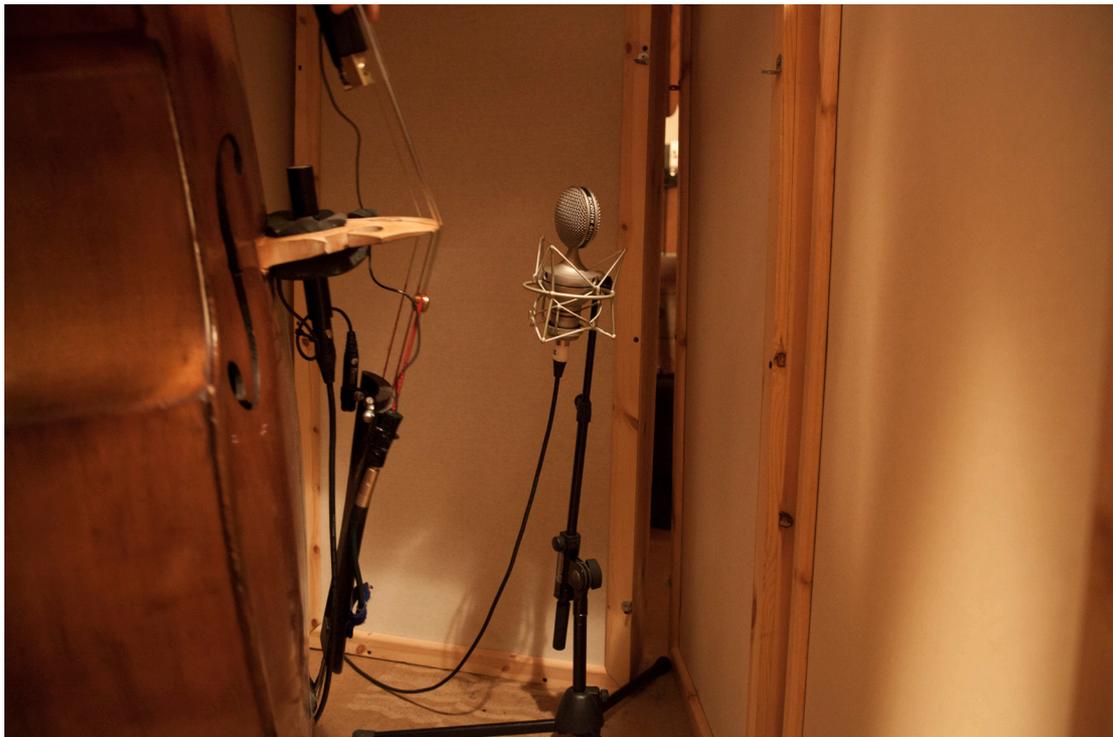


Figure 74: Bass microphone technique

We also built a more isolated 'microphone booth' from modular baffles, this time with a lid, to further attenuate spill from the piano (figure 74).

Piano

The larger Yamaha C6 presented significantly more defined low frequency information. We had removed the lid of the Kawai when recording V2.0 to improve low frequency capture, but this was now unnecessary. The presence of a lid enabled us to further improve isolation between the bass and piano.

We discussed the presentation of the piano at length ahead of the session and felt that we wanted to capture the instrument as accurately as was possible, and that we would attempt keep the stereo image and frequency presentation of the instrument constant throughout the new record. With this in mind we restricted ourselves to the use of a single ORTF pair (as a result of the array's accurate stereo localization and generally good mono compatibility) and set about auditioning a large number of microphones (figure75).

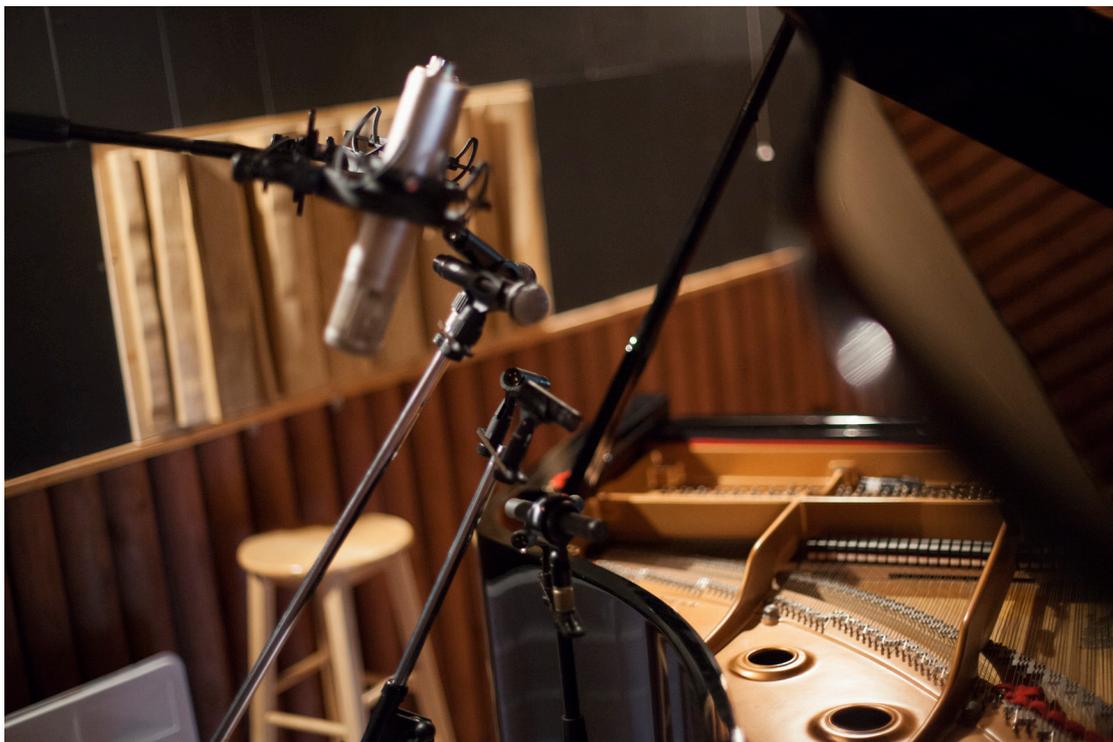


Figure 75: Auditioning piano microphones

We were initially drawn to a pair of modified Peluso C12s (after disregarding some Schoeps, Line Audio and Beyerdynamic pairs) but felt that the low frequency capture could be improved. The final microphones which we auditioned were a pair of AKG C414s, which we had initially omitted from the process. These modified microphones contained 'vintage' brass C12 capsules. They sounded markedly more accurate and engaging than anything we had tried so far. The final configuration employed both the 414s and the Peluso C12s (now in a NOS array), although the 414s were used exclusively on all but one track (figure 76).

The extreme high end of the piano was subtly lifted with the studio's Pultec equalisers. We felt that the piano presentation was a marked improvement over that of V2.0 in terms of accuracy and stereo localisation.



Figure 76: Final piano microphone configuration - ORTF 414s and NOS Peluso C12s

With microphone technique established we recorded the new material over a period of seven days. Whilst working on the session we were visited by Nicolas Pflug from Blue Note, who was a discreet but encouraging presence on the sessions. Whilst tracking we did work with some of the reverberation units employed on V.20 but a plan was developing to experiment with something markedly different on our return to Manchester.

Spatialisation and Mixing

Once home we began the mixing process in earnest, two week-long sessions were booked in 80Hz to enable us to complete the process. In this period we developed a system where the multitrack recordings (often totalling around 30 tracks) were summed to 16 channels of the Neve Genesys console, enabling us to use George's analogue dynamics and

equalisation processing equipment in a stemmed 'hybrid' mix environment. Three pieces of equipment became extremely important to this process. A Manley Vari Mu stereo compressor and Massive Passive equaliser were used in series on the piano to subtly control dynamic range and tailor the frequency response of the instrument within each track. An ELI Fatso tape simulator was used as a parallel compressor on the drum buss to add density to the mix. In addition to plug in based processing (largely Universal Audio Designs) we used the console's equalisers to subtly shape tracks where necessary. Early in the mix process we planned technically to allow for how we might spatialise the instrumentation and ultimately devised a system which would be used throughout the mixing process.

From previous experience we knew that 80Hz live room had an interesting reverberation characteristic, I had worked on many sessions there by now. We began to experiment with how we might turn the live room into a tightly controlled reverb chamber. I had worked with improvised chambers before: I used a large – occasionally empty – space above my Krakk studio whilst mixing the Magic Arm album *Images Rolling* and included the reverberation characteristics of the stairwell in my Kings Arms facility prominently on the Dutch Uncles track *In N Out*. In these situations I had used a single speaker to project individual elements of a mix into the spaces and incorporated the recorded results back into the mix, but here I drew from recent technical experiences of organising the playback of multichannel electro-acoustic compositions.

We arranged three speakers in the live room which were positioned to face the space's far wall; two were placed behind baffles and one outside the door of the drum booth (figures 77 and 78). A Decca Tree was raised high into the room in order to capture the diffuse reverberation which these speakers would generate.

We chose to utilise three speakers as this would allow for more detailed control of the spatialisation: A mono submix of each of the three core

instruments was created and (via three auxiliary sends, allowing for variation in relative volume) these discrete mixes were each sent to an individual speaker. We were able to place each recreated 'instrument' at different points in the space and could also retain greater fidelity, as each speaker would be dedicated to the reproduction of only one instrument. After experimentation we arrived at an arrangement of the speakers in the live room which supported the use of the stereo field established in the mix. Figure 79 shows the studio's console. In the bottom right corner of the image the letters P,B,D are written on three consecutive channels of the desk, denoting piano, bass and drums, from these channels the mono mixes were sent to the speakers.



Figure 77: Decca Tree used to capture reverberation in 80Hz



Figure 78: Speakers in the 'reverb chamber' – two Adam P22a's and a Genelec 8030

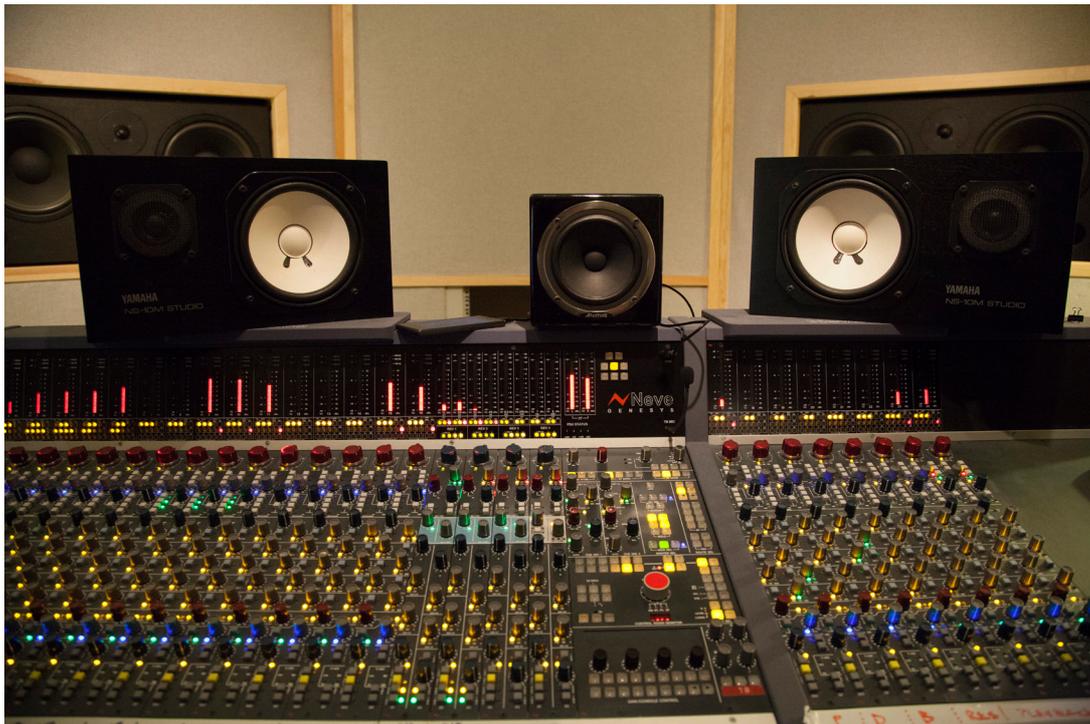


Figure 79: 80Hz mixing console

After listening to the results, we chose to use only the left and right microphones of the Decca Tree (a pair of omnidirectional Telefunken

M61s) as the central microphone did not contribute anything useful in this context.

The system enabled us to create the illusion that the band were playing in a singular performance space (in the way that one might expect a jazz trio to) but with a level of detail in the capture and control of the spatialisation which would simply not have been possible if we were to have had the band physically perform in this environment. Blending the capture of the reverb chamber with the original mixes resulted in a deep and engaging soundstage.

The video clip '6.3 80Hz Chamber Sweep - Protest.mov' illustrates this process. The camera's internal microphone picks up the resultant reverberation when the track stops playing (Joe is seen working on the mix in the control room).

The audio clip '6.4 All Res Chamber Mix.wav' exemplifies this further. The clip slowly fades in revealing an unprocessed (dry) mix. At 0:46 you hear the reverberation chamber 'soloed'. At 1:16 the two signals are blended. At 1:30 the level of the chamber is faded out and then gradually fades back in as the example draws to a close.

This innovative approach to spatialisation was used throughout the mixing process of *Man Made Object* and gives the record a tangibly different spatial aesthetic to that of *V2.0*.

Reception

The Guardian (John Fordham)

Though 2014 Mercury Prize contenders *GoGo Penguin* are a jazz-schooled trio who now record for Blue Note, they're a lot more interested in the nuances of groove, and in the contact points between acoustic and machine music, than in jazz as most beboppers know it. This Blue Note

debut follows the minimalism-to-maelstrom paths of *Fanfares* and the more electronic *v20*, but many of these tracks started life on sequencers and then evolved through real-time group acoustic improv. Chris Illingworth's looping piano motifs with their casual classical flourishes, Nick Blacka's bowed bass and Rob Turner's hustling drums sometimes fuse with a hip equanimity reminiscent of Robert Glasper; *Weird Cat* and the folksy *Initiate* show that GoGo tunes don't have to be sparse; and the captivating *Smarra* is a highlight for its threading of an echoey, synth-mimicking throb through a humming undertow toward a deluge of cymbals. It still feels like clubbing music, and perhaps best heard live, but plenty of house and techno fans might be surprised by how good at partying three closet-jazzers can be. (Fordham, 2016)

Pitchfork (Marcus J. Moore)

...The album comes on the heels of a revival of sorts for jazz music, where artists like Kendrick Lamar, David Bowie, Flying Lotus and Kamasi Washington fused the genre with their own blends of rap, rock, electronica and soul. The success of their respective LPs brought jazz back into mainstream view and made it more accessible for younger listeners.

Man Made Object resides in similar space. Much like the band's first two albums—*Fanfares* and *v2.0*, the latter of which was shortlisted for a Mercury Prize Album of the Year—the band's new album takes hold right away and sustains an upbeat groove. Even in its quieter moments, like those on "GBFISYSIH" and "Initiate," they carry a reflective vibe without losing momentum. *GoGo Penguin* creates jazz in the same vein as Robert Glasper: It's a piano-driven blend with all the traditional aspects you'd expect from the genre while still scanning as something refreshingly vibrant and contemporary. There is a percussive strain of frenetic drum breaks and rock-infused instrumentals, like on "*Smarra*," where a fluttering bass line takes center stage, ramping up the rhythm until it burns to a smoldering heap. It's the best moment of an album filled with unique creative twists... (Moore, 2016)

Conclusion

This commentary establishes that the new knowledge contained within audio recordings can be illuminated through detailed documentation and discussion, specifically tailored to the particular artefact under consideration and its wider musical context. With further discourse practising engineers and producers can develop a shared methodology which should result in the ability to peer review this new form of documentation, allowing academics in the field to publish with greater flexibility of output.

There will of course be disagreements about what format this documentation might take: Will it be necessary for the author to demonstrate their understanding of microphone technique or will a simple table suffice as an explanation of creative practice? Will floor plans of the studios under investigation and reverberation measurements be required components of the documentation? Should, and how will we deal with outputs which implement no traditional microphone technique?

Terms such as 'the engineer as archaeologist' and the 'embedded producer' might become useful for other academics as a means of positioning particular modes of practice. The adoption of shared language would help to establish recording / production as PaR within the academic community at a time when many music departments are investing in substantial music technology and recording facilities.

The process of study towards this PhD has been deeply rewarding. By considering my creative practice formally and situating my outputs within academic discourse I have noticed changes in my current methodology: I feel more acutely aware of where I might be at any given time in the wider arc of the record-making processes, where an imminently approaching decision might take me when there are multiple options to negotiate. My practice is defined by broad engagement in the art of record-making, through this programme of study I have become more sensitive to the way

in which this plurality is manifested in my work. I value aesthetic counterpoint highly in the music which I produce with my co-collaborators and I have become more adept at incorporating and heightening this facet of creativity into my day-to-day activities.

Current and Future Activity

Amongst many new creative developments, I continue to work with all of the primary collaborators mentioned in this document. A Dutch Uncles album will be released in early 2017 which I recently co-produced at my new studio facility, Low Four. I will record another GoGo Penguin album (again, alongside Joe Reiser) in summer 2017 and I am currently working with a new artist signed to Gondwana Records.

Discussions are underway regarding a process by which engineering and production focussed PaR might become an established form of research in the academy. Along with colleagues at the University of Salford I am investigating an AHRC networking bid, with the potential to form partnerships with the University of Aalborg (Denmark) and Middle Tennessee State University (U.S.A).

Having recently returned from the Art of Record Production conference in Denmark (where I delivered a paper centred on my outputs with GoGo Penguin) I feel confident that the work which we undertake as creative collaborators is indeed becoming more readily accepted as PaR in the academy. I look forward to contributing to this growing field of activity.

Bibliography

- Andrew Proudfoot and Duncan Wallis. (2013). *Glock Rock with the Clogs Off, Baby*. (D. Lucas, Interviewer)
- Aphex Twin (1996). *Richard D. James* [Recorded by A. Twin]. On *Richard D. James*. R. D. James.
- Aphex Twin (2001). *Drukqs* [Recorded by A. Twin]. On *Drukqs*. R. D. James.
- Birchall, N. (2009). *Akhenaten* [Recorded by N. Birchall]. On *Akhenaten*. N. B. Halsall.
- Bowie, D. (n.d.). *Low* [Recorded by D. Bowie]. On *Low*. D. B. Visconti.
- Buena Vista Social Club (1997). *Buena Vista Social Club* [Recorded by B. V. Club]. On *Buena Vista Social Club*. N. Gold.
- Burgess, R. J. (2013). *The Art of Music Production: The Theory and Practice*. Oxford: Oxford University Press.
- Bush, K. (n.d.). *Hounds of Love* [Recorded by K. Bush]. On *Hounds of Love*. K. Bush.
- Classical Music Hyper-Production. (n.d.). *Classical music hyper-production*. Retrieved from Classical music hyper-production: <https://www.uwl.ac.uk/classical-music-hyper-production/about-project>
- Coltrane, A. (1971). *Journey In Satchidananda* [Recorded by A. Coltrane]. On *Journey In Satchidananda*. A. C. Michel.
- Coltrane, J. (1962). *Coltrane* [Recorded by J. Coltrane]. On *Coltrane*. B. Thiele.
- Coltrane, J. (1965). *A Love Supreme* [Recorded by J. Coltrane]. On *A Love Supreme*. B. Thiele.
- Crane, L. (2005). Retrieved from www.tapeop.com: <http://tapeop.com/interviews/49/ethan-johns/>
- Davies, S. P. (2012). *You Tube*. Retrieved from You Tube: <https://www.youtube.com/watch?v=m6357vL9TPg>
- Davis, M. (1957). *Miles Ahead* [Recorded by M. Davis]. On *Miles Ahead*. G. A. Lampley.

- Davis, M. (1959). Kind Of Blue [Recorded by M. Davis]. On *Kind Of Blue*. I. Townsend.
- Davis, M. (1979). Circle In The Round [Recorded by M. Davis]. On *Circle In The Round*. J. F. McEwen.
- Dockwray and Moore. (2010). Configuring the Soundbox 1965 - 1972. *Popular Music*, 29/2, 187.
- Duke, G. (1973). Capricorn [Recorded by G. Duke]. On *Faces In Reflection*. B. G. Falk.
- Dutch Uncles (2008). Dutch Uncles [Recorded by D. Uncles]. On *Dutch Uncles*. G. Parton.
- Dutch Uncles (2011). Cadenza [Recorded by U. Dutch]. On *Cadenza*. B. W. Bulleyment.
- Dutch Uncles (2011). Salve to the Atypical Rhythm [Recorded by D. Uncles]. [Single]. B. Williams.
- Dutch Uncles (2013). Out of Touch in the Wild [Recorded by D. Uncles]. On *Out of Touch in the Wild*. B. Williams.
- Dutch Uncles (2015). O Shudder [Recorded by D. Uncles]. On *O Shudder*. B. W. Uncles.
- Dylan, B. (1963). The Freewheelin' [Recorded by B. Dylan]. On *The Freewheelin'*. T. Wilson.
- Eastgate, I. (2012).
<https://www.youtube.com/watch?v=5BVZzkwDucQ&list=RD5BVZzkwDucQ#t=69>. Retrieved from You Tube:
<https://www.youtube.com/watch?v=5BVZzkwDucQ&list=RD5BVZzkwDucQ#t=69>
- Eno, B. (2000). Forward - The Early Gurus of Electronic Music. Elipsis Arts.
- Floyd, P. (1979). The Wall [Recorded by P. Floyd]. On *The Wall*. B. E. Waters.
- Fordham, J. (2016, February 11). *The Guardian Music*. Retrieved from The Guardian:
<https://www.theguardian.com/music/2016/feb/11/gogo-penguin-man-made-object-review-blue-note>

- Foster, R. (1972). Mystic Brew [Recorded by R. Foster]. On *The Two Headed Freap*. D. G. Butler.
- Gang Starr (1998). Robin Hood Theory [Recorded by G. Starr]. On *Moment Of Truth*. D. Premier.
- Gibson, H. (2015, February 19). <https://www.theguardian.com/music>. Retrieved from <https://www.theguardian.com/music>: <https://www.theguardian.com/music/2015/feb/19/dutch-uncles-o-shudder-review>
- GoGo Penguin (2012). Fanfares [Recorded by G. Penguin]. On *Fanfares*. G. Penguin.
- GoGo Penguin (2014). V2.0 [Recorded by G. Penguin]. On *V2.0*. B. W. Joe Reiser.
- Halsall, M. (2008). Sending My Love [Recorded by M. Halsall]. On *Sending My Love*. M. Halsall.
- Halsall, M. (2011). On The Go [Recorded by M. Halsall]. On *On The Go*. M. Halsall.
- Halsall, M. (2012). Fletcher Moss Park [Recorded by M. Halsall]. On *Fletcher Moss Park*. M. Halsall.
- Halsall, M. (2014). When The World Was One [Recorded by M. Halsall]. On *When The World Was One*. M. Halsall.
- Hennion, A. (1989). An Intermediary Between Production and Consumption: The Producer of Popular Music. *Science, Technology, & Human Values*, 14(4), 400-424.
- Hesketh, K. (2012). *You Tube*. Retrieved from You Tube: <https://www.youtube.com/watch?v=XikoloTT1Zc>
- Howlett, M. (2012, June). The Record Producer As Nexus. *The Art of Record Production*(6).
- Japan (1981). Tin Drum [Recorded by Japan]. On *Tin Drum*. S. N. Japan.
- Johns, E. (2005). Nothing Safe About Rock & Roll: Ethan Johns on Record-making for Kings of Leon, Ryan Adams, Ray LaMontagne. (L. Crane, Interviewer) Tape Op.
- Johnson, P. (2009, December Sunday). Nat Birchall - Akhenaten, Review. *The Independent*. The Independent.

- Johnson, P. (2012, October Saturday). Matthew Halsall - Fletcher moss Park, Review. *The Independent*. The Independent.
- Kahn, A. (2000). *Kind Of Blue: The Making of the Miles Davis Masterpiece*. Da Capo Press.
- Kahn, A. (2002). *A Love Supreme / The Creation of John Coltrane's Classic Album*. Granta Books.
- Kealy, E. R. (1979, February). From Craft to Art - The Case of Sound Mixers and Popular Music. *Sociology of Work and Occupations*, 6, 3-29.
- King Crimson (1981). Discipline [Recorded by K. Crimson]. On *Discipline*. K. C. Davies.
- Lindsay, B. (2014, March 15). *All About Jazz*. Retrieved from All About Jazz: <https://www.allaboutjazz.com/v20-gogo-penguin-gondwana-records-review-by-bruce-lindsay.php>
- M Magazine. (2013, May 17). 30 Seconds Interview - Gogo Penguin. (M. Magazine, Interviewer)
- Mahavishnu Orchestra (1971). The Inner Mounting Flame [Recorded by M. Orchestra]. On *The Inner Mounting Flame*. Columbia Records.
- Massey, H. (2000). *Behind The Glass*. Backbeat Books.
- Metronomy (2011). The Look [Recorded by Metronomy]. On *The English Riviera*. J. Mount.
- Monk, T. (1967). Underground [Recorded by T. Monk]. On *Underground*. T. Marcero.
- Monroe, J. (2015, February 27). <http://pitchfork.com>. Retrieved from <http://pitchfork.com: http://pitchfork.com/reviews/albums/20248-dutch-uncles-o-shudder/>
- Monty. (2012). *People.xiph.org*. Retrieved from People.xiph.org: https://people.xiph.org/~xiphmont/demo/neil-young.html#toc_1ch
- Moore, M. J. (2016, February 9). *Pitchfork*. Retrieved from Pitchfork: <http://pitchfork.com/reviews/albums/21463-man-made-object/>
- Peterson, G. (n.d.). BBC Radio Worldwide.
- PRS Foundation. (2016). *Momentum Music Funding*. Retrieved from <http://www.prsformusicfoundation.com/funding/momentum-music->

- fund/: <http://www.prsformusicfoundation.com/funding/momentum-music-fund/>
- Saunders, P. (1971). Thembi [Recorded by P. Saunders]. On *Thembi*. E. M. Szymczyk.
- Skea, D. (2001). Rudy Van Gelder in Hackensack: Deffining the Jazz Sound in the 1950's. *Current Musicology*, 71-73, 61.
- Skea, D. (2002). Rudy Van Gelder in Hackensack: Defining the Jazz Sound in the 1950's. *Current Musicology*, 71-73.
- Slater, M. (2015). Nests, arcs and cycles in the lifespan of a studio project. *Popular Music*, 34(1), 67–93.
- Smith, S. (2013). *Hip-Hop Turntableism, Creativity and Collaboration*. Ashgate.
- Snapes, L. (2013, January 16). <http://pitchfork.com>. Retrieved from <http://pitchfork.com>: <http://pitchfork.com/reviews/albums/17431-out-of-touch-in-the-wild/>
- Snapes, L. (2013, January). Out Of Touch In The Wild, Review. *Pitchfork*. Pitchfork.
- Spicer, D. (2012). Matthew Hallsal - Fletcher Moss Park, Review. *BBC Music*.
- Stealing Sheep (2012). Into The Diamond Sun [Recorded by S. Sheep]. On *Into The Diamond Sun*. S. Crombie.
- Stubbs, D. (2013, January 7). <http://www.nme.com>. Retrieved from <http://www.nme.com>: <http://www.nme.com/reviews/album/reviews-dutch-uncles-13945>
- Stubbs, D. (2015, February 15). www.nme.com. Retrieved from www.nme.com: <http://www.nme.com/reviews/album/reviews-dutch-uncles-15925>
- Talking Heads (1977). 1977 [Recorded by T. Heads]. On *1977*. T. B. Heads.
- Tribe Called Quest (1993). Electric Relaxation [Recorded by T. C. Quest]. On *Midnight Marauders*. Jive Records.
- Vandemast-Bell, Werner, & Crossley. (2015). Seeking Best Practice for Education and Training in the Recording Studio. *26th UK AES Conference on Audio Education*. AES.

Vangelis (1982). Blade Runner Theme [Recorded by Vangelis]. On *Blade Runner (Soundtrack)*. Vangelis.

Various (2000). The Early Gurus of Electronic Music [Recorded by Various]. On *The Early Gurus of Electronic Music*. Elipsis Arts.

Wallis, D. (2013, July 18). (M. Magazine, Interviewer)