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Everything in its Place: A Conceptual Framework For Anti-Music

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A Conceptual Framework For Anti-Music

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Abstract: In this paper I describe my live performance practice utilising bespoke synthesisers and controllers. I address the conceptual approach and processes in the context of esoteric systems and give a technical description of the instruments. I situate my work in the context of Victorian Spiritualism and magic ritual. Following their precedent, I amalgamate systems and esoteric concepts to meet the goals of transformation and connecting to unknown forces, designing hybrid systems that allow me to approach a performance as an automatic mediumship process. I work primarily with NASA's lunar orbital data, W.B. Yeats' esoteric system detailed in *A Vision* (1937), and the Tarot. These systems, in conjunction with the hardware instruments, allow me to devise an invocation performance practice, where I draw forth music from the aether, tapping into unseen and unknown forces outside of myself. Opposing binaries of the analogue and the digital, hardware and software, scientific data and esoteric systems, produce a ritual invocatory performance. The depth and complexity of the systems are such that I can abandon Western musical conventions while maintaining a sense of form and structure, creating a framework for receiving and embracing transmissions from the vast possibilities of noise, the cosmos, and translating them into an immersive listening experience.

Introduction

In this paper I describe my live performance practice, focusing on *Everything in its Place* (2014-current), an improvisational solo project utilising bespoke synthesisers and controllers. I address the conceptual approach and processes in the context of esoteric systems and give a cursory technical description of the instruments as they relate to the greater conceptual context. I situate my work in the historical context of composers, poets, and writers working with experimental electronics and chance procedures to develop systems for creation that offer possibilities beyond that of the established Western music tradition. I connect my practice and design processes to Victorian Spiritualism and magic ritual. Following in the methods of historical and contemporary magic practitioners that amalgamate systems to meet their goals of transformation and connecting to unknown forces, I design hybrid systems for improvisation that allow me to approach a performance as an automatic mediumship process, where forces beyond my consciousness may speak. This process provides a broader range of outcomes than would a prepared traditional score or fixed automated software system. I describe the performance ecology, which encompasses the software and hardware instruments (*Domino* and *Byzantine*), and how the physical interaction with these functions to build the perception of magic ritual for the audience.

I work primarily with three systems: the US National Aeronautics and Space Administration (NASA) orbital body data (*Horizons*), William Butler Yeats' esoteric system

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based on moon phases detailed in *A Vision* (1937), and the numerology and symbolism of the Tarot. W.B. Yeats was an Irish poet credited as a founder of the Irish Literary Revival and known for his work with Celtic mythology. His system written in *A Vision* is situated in the centre, as it contains elements of both Tarot and lunar mapping. It functions as a bridge between the seemingly unconnected Tarot and NASA data. Lunar data mapping balances the arcane and esoteric with scientific reasoning. These systems, in conjunction with the hardware instruments, allow me to devise an invocation performance practice, where I draw forth music from the aether, tapping into unseen and unknown forces outside of myself.

I have come to noise music from a traditional classical background as a flautist, bassoonist, and composer. As an instrumentalist, the tactile experience of music-making and the intimacy of a performer and their instrument is of prime importance. My gravitation to noise music grew from a dissatisfaction with the culture of acousmatic music performance, where the focus on reduced listening, wherein the audience listens to recorded music over loudspeakers in a dark concert hall, often results in a loss of physical connection between performer and source, and performer and audience. As a means of resolving that disconnect for myself, I began building hardware controllers and instruments for live performance. Naturally, the more I worked with hacked hardware—which is the "creative transformation of consumer electronic technology for alternative use"—and noisy circuits, the further I drifted from the acousmatic world into experimental and noise genres.[1]

Methodology

I was introduced to chance electronics via circuit-bending through the work of Reed Ghazala, the "Father of Circuit Bending." His work was influential to my process of conceptualising instruments as devices for mediumship, as well as incorporating hardware into alternative systems for composition and performance. The tagline of his book, *Circuit-Bending: Build Your Own Alien Instruments*, immediately conjures associations with aether music, exhorting us to "Free the Ghost in the Machine, Create the sounds of another dimension." Ghazala frames his circuit-bending practice, which he refers to as an anti-theory, as a means of music creation outside of established Western music:

> In the chief ways that establish music via instrument design, circuit-bending produces a different animal and a *truly alien* music engine. In effect, the bent instrument opens a world of music that in theory, circuit design and, often, musical composition operate outside of human presumption. And presumption in music is key.[2]

The process of circuit exploration has influenced my current methodology, which is to work simultaneously in bottom-up and top-down approaches. Following the practice of Nicolas Collins, David Tudor, and the Composers Inside Electronics collective, I regard system design as the composition itself. Collins notes that: "The circuit—whether built from scratch, a customized commercial device, or store-bought and scrutinized to death—became the score."[3] Hardware prototypes are an exploration of technology, focusing on the tool's musical flexibility and modes of interaction. The instruments are tools to enact ritual performance, and that relationship should be conveyed in the physical design and recognised by the audience through both form and function. As such, both aesthetics and the phenomenological relationship inform the design process. My hardware and software instruments are designed to function as systems for performance akin to automatic writing. Through automatic writing, the medium, or performer, may access forces outside of their consciousness—unknown entities residing in the aether, or ideas buried in the subconscious.[4]

My practice is an investigation of physical (hardware) and virtual (software) systems, a hybridisation of analogue and digital technologies. These tools are paired with conceptual

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frameworks that replace traditional Western structures in order to create a complex compositional and performance system. My work explores interconnected systems and their hierarchies by appropriating non-musical systems for musical applications. I draw from various occult practices and texts, including ceremonial magic, Spiritualism, and divination. I employ Tarot cards to devise chance procedures and seek to emulate scrying (divination) tools with my instruments. The Tarot is a deck of seventy-eight playing cards with four suits correlating to a standard English card deck, and an additional suit, the Major Arcana, which depicts human characters and "describe a universal human process, which encompasses all the spiritual aspects of being."[5] John Cage's use of the *I Ching* inspired my decision to work with Tarot as an indeterminate compositional tool.

My approach to system design is influenced by magic practice, where combining systems and traditions is common. Damon Zacharias Lycourinos has mapped the ritual practices of contemporary ceremonial magicians. He notes the tradition of amalgamation in primary sources for such work:

> The Ninth Key of Gabriel and Levaniel, the Apollonian Invocation, and the Mithras Liturgy were historically constructed by combining a variety of esoteric and cultural motifs to form a multifaceted cosmology, yet interpreted through the dominant theological discourses of the day and age of their composition.[6]

Lycourinos notes that the Hermetic Order of the Golden Dawn, of which Yeats was a notable member and from which he drew much inspiration for the symbolism in his writing, also developed their system through combining traditions and sources:

> The Golden Dawn espoused an operational blending of ritual magic, astrology, and alchemy deriving from the Kabbalah; Hermeticism, Neoplatonism, and Greco-Egyptian godforms; grimoires, such as *The Key of Solomon* and *The Book of Abramelin*; Renaissance *magia*; and the Enochian system of the Elizabethan magus John Dee.[7]

He further goes on to explain that this *reconstructive approach* is fluid and specific to the goals of the practitioner:

> From my own observations and analysis, the purpose of these reconstructive approaches was to establish a ritual structure that was coherent with both the narrative of the primary sources and the ritualists' personal objectives.[8]

Referring to Yeats' creative process in relation to aggregating sources, Kathleen Raine succinctly states: "Eclecticism may be bad for theology but it is indispensable to poetry."[9]

Noise and Chance Precedence

I follow in a rich tradition of noise music that includes bespoke instrument building, chance procedures, and occult influences. It is from this tradition that I have been inspired to develop this system, which is a collage of non-musical systems for chance and improvisation. While the Futurists initially set the groundwork for noise music, the Dadaists developed techniques that would more frequently be seen and heard in the following generations of noise, namely chance, collage, and cut-up:

> Their dismantling of sounds, works and language, coupled with their use of clangorous noise-making makeshift contraptions during their acts, were early examples of the *ur*-performative nature of some modern noise musicians."[10]

Filippo Tommaso Marinetti's free word technique likely inspired the poetic cut-up method of the Dadaists. However, whereas Marinetti was primarily interested in the sounds of words, consonants, and vocalisms, and their likeness to noises to imitate real-life sounds, the Dadaists were concerned with dismantling the meaning of words and symbolism. Beat poet

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William S. Burroughs, whose ideologies were adopted by industrial and noise musicians, popularised the cut-up technique. Burroughs implemented the technique in order to break down the traditional symbolism of language constructs by abstracting words and phrases from the initial context:

> Concerned in his boundless paranoia that language itself is an agent of enemy control, Burroughs sought to liberate humanity and literature from the assumptions and constraints that language imposes.[11]

Brion Gysin, a fellow Beat and Postmodern artist, introduced cut-up to Burroughs in 1959. Burroughs noted the technique's established history in montage painting and attributed the technique's beginnings to Tristan Tzara, who in 1916 recited a poem by randomly drawing words from a hat. Burroughs and Gysin's method of cut-up was to cut "pages of text into vertical columns, and then [rearrange] these long strips of paper in random order."[12] They then applied this method to tape and photographs. Industrial and noise musicians would replicate the tape experiments. The random aspect of cut-up would be taken up by other composers, such as Cage, who went beyond sheer randomness to develop chance procedures for composition, defining the practice as "aleatory." Burroughs acknowledged that the random process of the cut-up was only superficially random, describing the cut-up process during a lecture, "we know so much that we don't consciously know that we know that perhaps the cut-in was not random."[13]

From the Aether

My integration of noise music and magic is inspired by Michel Serres' writings on the connection of noise and cosmology, where he depicts noise as being the fabric of the cosmos from which all order and meaning is drawn:

> The cosmos is not a structure, it is a pure multiplicity of ordered multiplicities and pure multiplicities. It is the global basis of all structure, it is the background noise of all form and information, it is the milky noise of the whole of our messages gathered together.[14]

From this one might argue that music is an ordering of the cosmos, of the vast potential of noise. To tap into this vastness to pull ideas, stories, and sounds from our subconscious or an undefinable existence beyond ourselves, we can open our process of reception through esoteric devices.

Victorian Spiritualism was able to prosper due in part to the prevalence in scientific and para-scientific discourse among the lay population that began in the late 1700s. Building on the work of Isaac Newton and others on magnetism, Franz Mesmer experimented with magnets as a means of physical and psychological healing. Mesmer proposed the existence of "animal magnetism," or an invisible magnetic fluid and life-force which could be manipulated through his practice of "Mesmerism" (a precursor of what James Braid later named hypnosis).[15] He had a particular concern for the setting; the lighting, music, wardrobe, and scents were carefully planned. Mesmer's "medical" practice was indeed a performance. His parlour was a theatre and established a precedent for scientific experimentation as performance. Mesmer's trance practice later evolved into the séance, a ritual that was the foundation of Spiritualism, the latter generally seen as "a system of beliefs and practices for contacting the dead."[16] The séance was a trance performed by a medium in the company of a small group of audience-participants. Mediums were "sensitive" and "susceptible" passive vessels through which spirits could communicate. In Edward Walter and Minnie Wallis' *A Guide to Mediumship and Psychical Unfoldment*, mediumship is defined as: "a susceptibility to the influence, and more or less control, of decanted spirits."[17] The medium would often use

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a scrying device, such as a crystal ball, to mediate transmissions between the dead and an eager audience. Spiritualism and the ritual of séance were not exempt from scientific inquiry by the likes of the Nobel prize winning physiologist Charles Richet. Séances were the rigorous experiments of Spiritualists and researchers seeking empirical evidence of life after death. As noted in *Practical Occultism: A Course of Lectures Through the Trance Mediumship of J.J. Morse*, "We repeat that the Trance, either in its magnetic, natural, or spiritually-induced form, is God's evidence and nature's indication of the utility of death and the reality of immortal life."[18]

The emergence of Spiritualism and the movement's international popularity led to a fascination with the occult and paranormal, and the subsequent formation of esoteric societies including the Theosophical Society, the Society for Psychical Research (whose membership included Richet, William Myers and William James), and the Hermetic Order of the Golden Dawn in the late 1800s. The membership of many of these societies was restricted to the middle and upper classes. Spiritualism, however, was open to all social classes and was an avenue for women, in particular, to take on positions of authority by channelling those of higher social status than themselves.[19] Esoteric societies were concerned with discovering occult secrets and developing doctrines and systems for research and practice. Spiritualism, however, was focused on contacting the dead, whether for personal consolation or entertainment, or as objective research to rationalise religion, faith in (G)od, or prove existence beyond the physical world. For artists, séances and trance practices were often a source of inspiration as well as a process to produce creative work and systems for creation.

Some artists, including Alexander Scriabin, focused on doctrines to develop creative work. Others, such as Yeats and Austin Osman Spare (whose work I discuss below) used trance techniques, including automatic drawing and writing, to produce personal systems and creative work. Helena Blavatsky, who founded the Theosophical Society in 1875, influenced many artists through her work. Scriabin was a Russian composer and mystic that took a keen interest in theosophy and Blavatsky after beginning his unfinished piece, *Mysterium*, in 1906. He adapted elements of her work, *The Secret Doctrine*, into a compositional system. He often spoke of the doctrine as truth, and explained to his friend and biographer, musicologist Boris de Schloezer: "You may not accept the doctrine of Seven Planes as the ultimate truth, but to me it serves as a convenient framework for classifying natural phenomena and for creating order out of the chaos of factual data."[20] Spare, an English artist and occultist, was also influenced by Blavatsky's writings and briefly became affiliated with Aleister Crowley's order, Argenteum Astrum, in 1909. Spare later dispensed with esoteric doctrines and developed a system of sigils and a Sacred (or Atavistic) Alphabet to tap into the subconscious and aid with automatic drawing.[21]

The Spiritualist movement coincided with inventions of early electronic communication devices. The telegraph was invented in 1844, just four years before the Fox sisters experienced the external rapping phenomenon at their home in Hydesville, New York, which is credited for igniting the movement. The link between science, technology, and Spiritualism could be observed in the literature and journalism of the scientific community and general populace. The language used in scientific discourse was mirrored in that of Spiritualism, and in fact spirit mediumship through automatic writing was referred to as Spiritual Telegraph.[22] This was an allusion to the mode of communication—tapping—that was often experienced during séances, as well as to the telegraph's communication possibilities, which were often poeticised, such as in the essay by Dr Samuel Byron Brittan,

"Silent Voices: The Natural Elements as Divine Ministers," published in the popular quarterly, *Brittan's Journal of Spiritual Science*, in 1874:

> As a direct instrumentality of the mind Electricity assumes the most important place and office among the imponderable elements of the natural world … The electric telegraph is the great sympathetic nerve that centers in the cardiac plexus of nations. Through this messenger of light we feel the pulses of great peoples beyond the sea, and we are brought into instant sympathy with the whole world.[23]

Taking this into account, might correlations between science, magic, and music be drawn with electronic music? The art of the electronic musician, like the Spiritualist, lies in *harnessing* and transforming energy (electricity), from the aether. The act of harnessing requires a physical device (the body or an external object), while that of transformation is both a mental and physical process that begins with the act of reception. The primary action in this process is *invocation,* an act that "calls on the divine … and deals with perfected, divine energy from realms beyond the human."[24] Invocation can be enacted through a number of means, such as physical devices, bodily actions, or vocalisations. My practice is based on the idea of invocation and transformation through both tangible and virtual devices. It is a practical and artistic application of magic. To be clear, I am using the word magic in the sense of a ritual performance to enact transformations.[25] In my practice, magic (which requires intent and active engagement) is part of the composition—the system—and performance process. In Susan Greenwood's ethnographic study of contemporary British Pagans, she notes the importance of prepared space and intent in magic performance:

> the practice of magic concerns primarily the conscious intentionality of the magician in the creation of a special magical space to contact the forces of the cosmos in order to channel them and bring through power from the otherworld … Thus the intentionality—or the magical will—of the magician is crucial to the performance of magic.[26]

My creative practice is both musical and ritual performance, both secular and sacred. Secular, as it functions as entertainment, and sacred, as it is a process of communing with the supernatural, or the "*otherworld,*" to use Greenwood's term. The musical performance space becomes the delineated space for magic ritual. The magic ritual circle, which is a boundary of protection, is now defined by the performance venue and includes the sound system, through which the voices of the aether may be made present. The performance table serves as the altar and as the focal point. On the altar/performance-table reside the tools necessary to access the cosmic forces. Magic is ingrained in the underlying system and is both physically and virtually accessible through technology. While there is chance, the system is not chaotic. It is built and limited by rules. The rules are a means to access—or invoke—hidden knowledge and information, drawing out shape and meaning from the formless mass. The rules direct information, or received transmissions, into musical structures and the content that functions within those structures.

Performance Ecology: Hardware

John Bowers defines *performance ecology* as an assembly of interactive devices used for electro-acoustic improvisation.[27] My own performance ecology is continually evolving and has followed a natural progression from circuit bending, to building noise circuits, to working with sensors and programming microcontrollers. It is important to define my practice as an ecology, where I have immediate access to multiple devices during performance. These devices, both hardware and software, operate as an ecology, as each has a specific and essential function, and the interaction amongst these devices informs the musical outcome.

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The placement of these devices on the table, which doubles as the ritual altar, is organised to facilitate dexterous movement between instruments and particular gestures, and the collection allows for multiple modes of interaction that are visible to the audience. The performance gestures are specific to the instruments—the ritual objects—and help imbue the performance with a sense of specified ritual. The perceived physicality of the gestures is essential for both the audience and performer to recognise the connection to ritual performance. In clarifying the purpose of this approach, Bowers states:

> The point here is that by moving from one side of the table to the other I can do different things and be seen to be doing different things—different in gesture type, device type and sonic consequence. Not only does this organisation of my playing environment make things more effective for me, it gives clues to the legibility of my gestures, both for co-performers and audience.[28]

My current setup includes two primary hardware devices: *Domino*, a backgammon case filled with noise-making circuits, and *Byzantine*, a capacitive-touch matrix controller (Fig. 1). *Domino's* hardwired circuits are the primary audio generators in the system, while *Byzantine* only sends control signals and is programmable. Both of these devices communicate with software built in Max/MSP running on a Macintosh computer. Incorporating tactile objects during performance is of prime importance, and as such, these hardware devices are the first order of both invocation and harnessing energy or transmissions. The design choices are rooted in connecting my body to the system, of merging my innate electrical signal with the system. Technically, this connectivity is obtained through capacitive and resistive touch sensors that allow me to control the flow of electricity within the instruments through skin contact. Capacitive sensors of this nature serve to measure the difference in electrical charge of a conductor between a touched and untouched state, whereas resistive circuits simply rely on the body to complete the circuit by functioning as a variable resistor.[29] Greenwood concludes that: "The body is the initial focal point of all Western magical work."[30] So while my designs are a practical application of sensor technology, the use of touch sensors conceptually underscores the connection to magic ritual, wherein the body is the locus of energy transformation. The sensation derived from the sonic immediacy is important for the performer to feel the connection to the tools and the system. From a phenomenological perspective, this direct connection allows the performer to break out of the boundaries and limitations of the body to not only control but connect with the system, and therefore the forces of the *otherworld*. Leon Theremin introduced the idea of extending the body into the electric circuit during performance with his etherphone, later named Theremin. The etherphone was named to denote that it was not played by touch, but by moving the hands within an electromagnetic field to alter the circuit's capacitance. The name also referenced "ether waves," a term for radio broadcasting still in fashion at the time among the general public.[31]

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Fig. 1. Live setup, *Domino* (left) and *Byzantine* (right)

Domino

The basis of the noise circuits in *Domino* are inexpensive and readily available digital logic integrated circuits: a hex-schmitt trigger, a gated oscillator, and a binary divider.[32] The circuits are derivatives of Collins' designs. Essentially the circuits produce shaped square waves, and hence a very raw sound. There are twenty-two individually controlled "voices" (the standard term for the sound output of an oscillator or group of oscillators) that are mixed down to six channels: two stereo pairs and two mono signals. To maximise the sound palette, timbre and frequency are controlled with potentiometers, photo-resistors, bare-wire resistors, simple pushbuttons, and toggle switches. With these controls I can obtain a range of sounds: light-dependent drone tones within a wide frequency, articulated bursts of noise played by touch, steady square-wave oscillators at various rates, and twelve percussive voices that create nested beats. The twelve-step binary divider's master clock signal is selectable from one of the other chips, allowing slow to fast timing that is either steady or fluctuating. The fluctuations are a result of the light-controlled oscillators. At the fastest rate the voices are no longer clicks, but pitched oscillators. Each voice and final output mix has individual volume control. The six outputs may then be sent directly to a mixer, or routed to a Max/MSP patch. In my current setup, the Max/MSP patch functions as a mixer and effect processor. All voices are allowed to pass unprocessed. Additionally, the stereo pairs (the drones and clicks) are sent to processors, including delay, ring modulation, and comb filtering.

One of the attractions to working with this configuration of noise circuits is that they provide an immediate sonic response, and put the body directly into the circuit by playing resistors through touch, which as previously noted, completes the circuit. The touch-dependent voices will not sound without touch activation, while the other voices can be set to passively play. The touch resistors are quite sensitive, detecting the smallest amount of change in skin contact. The physical action can be immediately heard and felt, and is often used to create the most aggressive and noisy element in performance.

Byzantine

After some years of playing in clubs and art spaces on substandard, often mono, audio systems, I started to miss diffusion practice and the immersion of a surround sound listening experience. Denis Smalley defines sound diffusion as:

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the projection and the spreading of sound in an acoustic space for a group of listeners … another definition would be the "sonorizing" of the acoustic space and the enhancing of sound-shapes and structure.[33]

I sought to return to diffusion for the purpose of utilising sound movement as a musical element, as well as immersive performance and listening. I began thinking about a solution for diffusion, or live spatialisation. The solution needed to be portable, allow control for surround sound diffusion, and fit my aesthetic of custom housings related to games. Returning to the concept of invocation, my design process began with the intent to create a unique, sacred device that evokes the idea of a divination and prophecy oracle. Conjuring the familiar image of the Delphic oracle Pythia gazing into a scrying bowl while seated upon her tripod enhances the ritual connection to performance.[34] The controller acts as a gate, in the way an oracle would in delivering a message from the gods, as it allows or disallows signal to pass, and decides where the information is sent.

In most sound systems, signals come together at a patch-bay (a site where signals are patched in), while a matrix is a hub from which signals may be routed to multiple destinations. *Byzantine* is a matrix controller utilising capacitive touch sensors. While *Byzantine* was originally designed for spatialisation, it is mappable within Max/MSP to any parameter, allowing for flexible performer customisations and applications, and a purpose beyond its current use. I chose capacitive touch sensors for both functional and conceptual reasons. Capacitive electrodes are quicker and allow for smaller packaging than mechanical switches. Mechanical switches also require more wiring, and therefore more space. On a conceptual level, capacitive touch puts the body in the circuit, akin to playing bare-wire resistors in *Domino's* circuits. When thinking about spatial music, this allows for the expansion of self through the instruments into the loudspeakers, which recalls the aspect of ritual performance through invocation, and transmission of signals—messages—from the aether.

Several factors determined the visual and functional design of the controller. The circular grid mimics a Byzantine chessboard, while the concentric rings are a reference to Robert Fludd's illustration of the organisation of the cosmos in his Neoplatonic encyclopaedia, *The Metaphysical, Physical, and Technical History of the Two Worlds, Namely the Greater and the Lesser*.[35] Practically, the design is a visual analogue of a standard eight-channel surround sound configuration, which is the more common loudspeaker configuration for electroacoustic concerts in the United States and the setup in the studio I worked in while developing the instrument at Brown University. For me, this visual analogue is more intuitive than the linear arrangement of faders on a mixing desk. The first prototype was a modified traditional chessboard, but since the square MIDI (Musical Instrument Digital Interface) controller is ubiquitous, I did not want to fabricate yet another square. I had the luxury of time and fabrication resources a one-off or limited-run project requires, so I was able to make a circular controller, which is a rarity in mass-produced products. The round board was also more economical for size and proved easier to reach across than a square board.

The underlying software in *Byzantine* controls two spatialisation systems in Max/MSP, which it communicates with using a wired, serial protocol over the Universal Serial Bus (USB). The first system is a matrix controller, where each touch point is mapped to a discrete signal and routes it directly to a loudspeaker. I have control over the volume and fade times by altering the linear gate timing. The second system controls the placement of a stereo source via a series of pan controls which may distribute sounds across a full sphere

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surround sound distribution (ambisonic). Each touch point can direct the stereo signal to an adjacent set of loudspeakers, or allow movements in fifteen-degree increments within a 360° sound field. I also have control over the depth and intensity of this signal by mapping the touch points to reverb. Points closest to the centre of *Byzantine* will direct the sound to the centre of the sound field, while those on the peripheral will sound farther away. While the purpose of the instrument is live spatialisation, there are moments that I need to focus my attention, and hands, on playing *Domino*. For this reason, there are several automation settings: trajectory read and recall, continuous spiral motion, and random motion within the ambisonic system. Electrodes dedicated to global functions allow me to choose between the matrix or ambisonic system, whether the sensors are momentary or latching, or an automation mode.

Esoteric Mapping 1: Lunar Data

Three systems—lunar data mapping, Yeats' *A Vision*, and the Tarot—are combined to build a mapping system that balances occult elements with scientific data. The conceptual mapping utilising Yeats' *A Vision* gives compositional and structural shape to the objective lunar and subjective Tarot data mapping.

The lunar mapping component is an evolution of a data mapping system I developed for previous projects, *Star Dust* (2014-15) and *Not To Touch The Earth* (2016), which are multichannel audio and projection installations set inside a geodesic dome. *Star Dust* was initially conceived as a mini-planetarium, and sonically relates to the Platonic-Pythagorean concept of the Music of the Spheres, especially the concept of planetary bodies possessing different tones, timbre characteristics, and orbital rates. These concepts have influenced a number of artists and composers, and is perhaps most recognisable in Gustav Holst's orchestral suit, *The Planets*, premiered in 1918. Henry Cornelius Agrippa described these qualities in *The Second Book of Occult Philosophy, or Magic*:

> But understand now, that of the seven planets, Saturn, Mars, and the Moon have more of the voice than of the harmony. Saturn hath sad, hoarse, heavy, and slow words, and sounds, as it were pressed to the centre; but Mars, rough, sharp, threatening, great, and wrathful words; the Moon observeth a mean betwixt these two.[36]

The data mapping system sonifies lunar data, which is downloaded daily via NASA's telnet service to the Horizons Ephemeris System.[37] As explained on the website:

> The JPL Horizons On-Line Ephemeris System provides access to key solar system data and flexible production of highly accurate ephemerides [trajectories of moving bodies] for solar system objects … The underlying planet/satellite ephemerides and small-body osculating elements [those which alter trajectory] are the same ones used at JPL for radar astronomy, mission planning and spacecraft navigation.[38]

Data calculations are made relative to the performance's longitude and latitude coordinate position, creating a location-specific performance. There are twenty-eight days, a full lunar cycle, in twenty-four hour increments represented in the data. The data cycles through the twenty-eight phases simply based on the estimated time of the performance, with only a slight variation in the duration of each phase. The synthesis and processing parameters change as the system moves through each of the twenty-eight days. The onset of each new lunar phase triggers a new set of Tarot cards to be drawn.

The lunar data represents an outside, omnipresent force, and a source from which transmissions may be received. In this context, the moon acts as a control mechanism for a performance. The system is both a sonification and data-driven composition system. The data is sonified through an inharmonic additive synthesis engine and is also mapped to control

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processing parameters. The synthesised sound, which is not always included in the live set, provides drone layers of interwoven beats throughout the frequency range, with more weight on the lowest audible frequencies. It creates pulsations and subtle vibrations that are intended to be reminiscent of our perceptions of glowing stars. In terms of sound design, this is a stereotypical "celestial" sound that has been associated with space and the Music of the Spheres. The vibrational controls are also applied to effect processing parameters. As the system reads through the data, progressing through each phase of the moon, the sonified moon orbits the space, rotating through the sound field. A number of factors influenced which data parameters were chosen: stability of pattern, range, and rate of change. Less stable, noisy, patterns are used for chaotic parameters, while parameters with slower rates of change are used where consistency is most important. In rare cases, a parameter was chosen based on what it represented, despite the numerical value, and was scaled moderately.

Esoteric Mapping 2: William Butler Yeats' *A Vision*

To counter the rigidity and precision of the lunar data mapping system, I use Yeats' *A Vision* (1937) as a guide for general form and structure in my live performances. Yeats was keenly interested in the occult. Through his memberships with the Theosophical Society and the Hermetic Order of the Golden Dawn, among other affiliations, he drew from a wealth of doctrines, systems, and practices that inspired his work.[39] *A Vision* began as an automatic writing exercise by his wife, Georgie Hyde-Lees, in 1917. Yeats translated the communications she received from the spirits into the written system presented in *A Vision,* which relates moon phases to a number of correspondences, some of which I discuss below.[40]

I employ Yeats' system as a general framework, allowing for flexibility and interpretation of his abstract ideas. Yeats' system is too complex to describe in full here. The system's core is composed of concepts that represent characteristics of human life: emotional, aesthetic, reason, moral, and external environments. These concepts, the "four faculties," are mapped in opposing pairs. Will and Mask are regarded as the lunar pair and govern creation and subjective experiences. This pair moves in contrary motion to the solar pair, Creative Mind and Body of Fate, which governs intellect and reality. The proportions of these faculties shift as they progress in a sequential pattern following the twenty-eight moon phases, with each faculty shifting as the moon shifts from new to full. The cycle repeats continuously and is nested in larger cycles that govern all aspects of human existence. These concepts move in gyres, or vortexes, which are simplified in diagrams as triangles, where "pairs of opposites whirl in contrary directions" (Fig. 2).[41] The phases of the moon are mapped by Yeats to a wheel to illustrate the cyclical nature of change:

> This wheel is every completed movement of thought or life, twenty-eight incarnations, a single incarnation, a single judgement or act of thought. Man seeks his opposite or the opposite of his condition, attains his object so far as it is attainable, at Phase 15 and returns to Phase 1 again.[42]
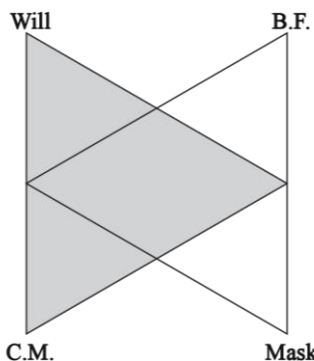
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Fig. 2. The four faculties:
Will, Creative Mind, Body of Fate, Mask.[43]

Yeats has listed each of the faculties with text descriptions through each moon phase in a manner that is translatable to perceptible musical parameters. Some descriptions relate to artistic practice more clearly than others that require more abstract interpretation. Phases two and three relate to the "beginning of energy," followed by the "beginning of ambition," which may collectively be interpreted as motivic development, whereas phase twenty-two represents the "balance between ambition and contemplation" and may be translated into musical relationships between gestures and drones or texture washes. Phase twenty-four, "the end of ambition," may indicate the termination of the ambitious motive. I generally attribute phase fourteen, "none except monotony," to a static voice, and phase twenty of "objective action" to a deliberate and obvious shift. Several phases have clear references to Tarot cards, such as "The Fool," "The Saint," "The Daimonic Man," and "The Hunchback," which can be used to create synchronous moments between the Yeats and Tarot systems. I should reiterate that I use the phase descriptions like a flexible text score, as suggestions for form and content. Drawing from the four faculty characteristics of each phase, there are several options for interpretation in performance. I may choose only one, all, or a combination of the four descriptions. I have interpreted these characteristics as musical and physical gestures, textures, tempo, density, and structures. The interpretation varies between performances. This is partly due to the variation of light in the performance space affecting the light sensors, which determines frequency range, and therefore tempo, or oscillator rate. Additionally, I might map gestures to different voices, choose alternative voices for drone layers, or various processors for the raw voices. The end result of the translation of the phases is a graphic and text score for non-specified instruments.

Esoteric Mapping 3: The Tarot

The Tarot system is a means to engage structured chance operations. Chance systems may allow us to access our subconscious and draw from outside forces. The imagery of the Tarot is connected to archetypal symbols and using Tarot for divination or creative practice is a means to tap into those universal symbols. Raine concludes her work on Yeats' use of the Tarot:

> The powerful symbols of the Tarot are among the many emblems of these primordial images by whose means the unchanging, universal aspects of reality may be apprehended; they underlie some of Yeats's greatest poetic images and were a part of that body of symbolic knowledge upon which he constantly meditated in the composing of his poetry and the living of this thought.[44]

Tarot has many layers and can be interpreted in many ways, offering more mapping possibilities than other chance-procedure or divination methods, such as dice or regular

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playing cards. Tarot is a progressive, multi-dimensional divination system. It represents a person's journey—past, present, and future—on both the mundane and spiritual realms. The Tarot cards tell stories. Individual cards and combinations represent events and relationships. These events may be combined with numerological correspondences to allow the cards to be easily mapped to art and musical forms. Numerological correspondences can be logically mapped to algorithms to control processing parameters, while symbolic meanings can be interpreted into more general musical processes.

I draw on the work of the famous Surrealist artist and esoteric theorist, Alejandro Jodorowsky, to determine numerological correspondences for the cards, which are then translated to a data string for each card. Jodorowsky's *The Way of Tarot* is a comprehensive work that focuses on the Tarot de Marseille deck, which I use exclusively. Following his method, each of the seventy-eight cards is mapped in relation to The World card as the key (Fig. 3). The placement of corresponding elements on The World note the numeral divisions on the key (Fig. 4). Tarot is a journey of ascension, and as such, the numeral assignments increase from bottom to top, one to ten. The cards have elemental and realm correspondences that are also noted by ascension on the key card. The elements are: earth, fire, water, and air. The realms are: earth, human, and heaven. The card is divided down the centre into receptive and active. The elemental relationship is easy to map in the Minor Arcana suits, where the suites—pentacles, wands, cups, and swords—have a given elemental correspondence. In the Major Arcana, this is noted by the placement of figures or characters within the field. This is also the method of assigning realms. Receptive and active might be depicted by the direction a character is facing, or the side of the body a character is holding a tool. A number for each element, realm, and active/passive assignment, along with the suit and card number, are included in the data string for each card. The data string is then parsed to respective parameters in the Max/MSP patch when the card is drawn, as determined by the lunar mapping system.
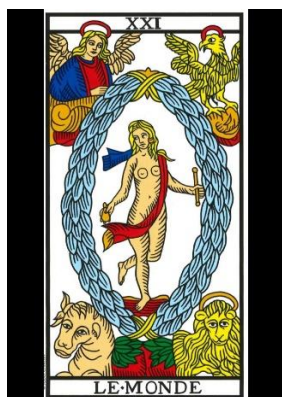

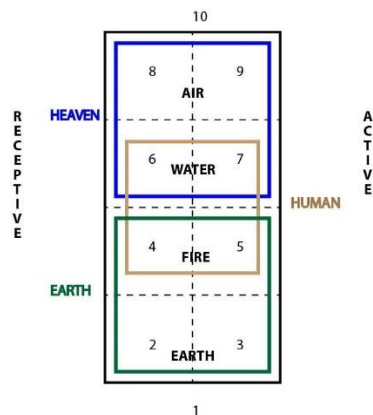Fig. 3. Le Monde, or The World card

of the Major Arcana.

Fig. 4. Tarot numerology key,

in relationship to The World card.

Conclusion

These systems—lunar data mapping, Yeats' *A Vision*, and Tarot—are individually complex, and each has the depth to suffice for unique mapping and performance strategies. The integration of these systems may seem murky and circuitous. However, the combination of

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the unique attributes of the subsystems into the larger structure allows for a more robust performance system with more parameters for manipulation and experimentation. The seeming impenetrableness of the system prevents rote performance by ensuring the system's indeterminate agency cannot be easily predicted during performance.

My performance practice is rooted in engaging the tangible and intangible to mediate transmissions from the aether. Through a performance ecology consisting of opposing binaries—analogue and digital, hardware and software, scientific data and esoteric systems—a ritual performance, an invocation, is enacted. The interconnected binaries create a complex network of structures governing musical parameters. The depth of the system is such that I can abandon Western musical conventions while maintaining a sense of form and structure in an experimental, abstract context, and create a framework for receiving and embracing transmissions from the vast possibilities of noise, the cosmos, and translate them into an immersive listening experience.

Endnotes

URLs accessed Mar 2019. Audio samples and additional documentation can be found at:
http://nicolecarrollmusic.com/everythinginitsplace-documentation/

[1] Nicolas Collins, *Handmade Electronic Music* (NY: Routledge, 2006), p. xiii.

[2] Reed Ghazala, *Circuit-bending: Build Your Own Alien Instruments* (Indianapolis, IN: Wiley, 2005), p. 14.

[3] Nicolas Collins, "Composers Inside Electronics," *Leonardo Music Journal*, 14 (2004), p. 1.

[4] On automatism in art and music, see also Anne LeBaron's keynote paper in this edition, "Sonic Ventures in Post-Truth Surrealism: Raudelunas, the Rev. Fred Lane, & *LSD: Huxley's Last Trip," Sound Scripts,* ??? TBA. See also David Lomas, "'Modest recording instruments': Science, Surrealism & Visuality," *Art History,* 27.4 (Sept 2004): 627-650; Anthony Enns, "Voices of the Dead: Transmission/Translation/Transgression," *Culture, Theory & Critique* 46.1 (2005): 11-26.

[5] Alejandro Jodorowsky & Marianne Costa, *The Way of Tarot: The Spiritual Teacher in the Cards*, trans. Jon E. Graham (Rochester: Destiny, 2009), p. 30.

[6] Damon Zacharias Lycourinos, *Ritual Embodiment in Modern Western Magic: Becoming the Magician* (NY: Routledge, 2018), p. 139.

[7] Ibid., p. 19.

[8] Ibid., p. 139.

[9] Kathleen Raine, *Yeats, the Tarot & the Golden Dawn* (Dublin: Dolmen Press, 1976), p. 33.

[10] Joseph Tham, "Noise As Music: Is There a Historical Continuum? From Historical Roots to Industrial Music," in Michael Goddard et al, eds, *Resonances: Noise & Contemporary Music* (NY: Bloomsbury, 2013), p. 260.

[11] S. Alexander Reed, *Assimilate: A Critical History of Industrial Music* (NY: Oxford UP, 2013), p. 33.

[12] William S. Burroughs, "Origin & Theory of the Tape Cut-Ups," in Burroughs, *Break Through in a Grey Room,* vinyl record (Brussels: Sub Rosa, 2016), SUB 33005-8.

[13] Ibid.

[14] Michel Serres, *Genesis*, trans. Geneviève James & James Nielson (Ann Arbor: Michigan UP, 1995), p. 111.

[15] See esp. Adam Crabtree, *From Mesmer to Freud: Magnetic Sleep & the Roots of Psychological Healing* (New Haven, CON: Yale UP, 1993)

[16] Jill Galvan, *Sympathetic Medium: Feminine Channeling, the Occult, & Communication Technologies* (Ithaca: Cornell UP, 2010), p. 3.

[17] Edward Wallis & Minnie Wallis, *A Guide to Mediumship & Psychical Unfoldment* (London: Office of Light, c.1910s), part 1, p. 19.

[18] J.J. Morse, *Practical Occultism* (San Francisco: Carrier Dove, 1887), p. 30.

[19] See Alison Winter, *Mesmerised: Powers of the Mind in Victorian Britain* (Chicago: Chicago UP, 1998).

[20] Boris de Schloezer, *Scriabin: Artist & Mystic*, trans. Nicolas Slonimsky (Berkeley: California UP, 1987), p. 66-67.

[21] Phil Baker, *Austin Osman Spare* (London: Strange Attractor, 2012), pp. 18-92.

[22] Samuel Byron Brittan, "Mansfield Mediumship," *Brittan's Journal of Spiritual Science, Literature, Art, & Inspiration,* 2.1 (Jan 1874), p. 118, reproduced on www.iapsop.com/archive/materials/brittans_journal/brittans_journal_v2_n1_january_1874.pdf.

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[23] Samuel Byron Brittan, "Silent Voices: The Natural Elements as Divine Ministers," *Brittan's Journal of Spiritual Science, Literature, Art, & Inspiration,* 2.4 (Oct 1874), pp. 188-9, reproduced on www.iapsop.com/archive/materials/brittans_journal/brittans_journal_v2_n4_october_1874.pdf

[24] Susan Johnston Graf, *Talking to the Gods: Occultism in the Work of W.B. Yeats, Arthur Machen, Algernon Blackwood, & Dion Fortune* (Albany: SUNY, 2015), p. 10.

[25] Schechner, Victor Turner and others see the conventions of Western theatre and art music as lying in ritual transformations and practices, contending that any "neat division" between the sacred and the secular is essentially "spurious" and that most "ceremonies approximate or include religious ritual" within their delineation and practice. See Richard Schechner, *Performance Studies: An Introduction* (London: Routledge, 2013), pp. 52-88.

[26] Susan Greenwood, *Magic, Witchcraft & the Otherworld: An Anthropology* (Oxford: Berg, 2000), p. 41.

[27] John Bowers, *Improvising Machines: Ethnographically Informed Design for Improvised Electro-Acoustic Music*, masters dissertation (Norwich: University of East Anglia, 2002), p. 59, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.219.1699&rep=rep1&type=pdf

[28] Ibid., p. 47.

[29] For explanations of these circuit processes see Robert Keim, "Introduction to Capacitive Touch Sensing," *All About Circuits* (24 May 2016), https://www.allaboutcircuits.com/technical-articles/introduction-to-capacitive-touch-sensing/

[30] Greenwood, p. 36.

[31] Albert Glinsky, *Theremin* (Chicago: Illinois UP, 2000), p. 26.

[32] Collins, pp. 120-136.

[33] Larry Austin, "Sound Diffusion in Composition & Performance: An Interview with Denis Smalley," *Computer Music Journal,* 24.2 (2000): 10.

[34] A particularly fine depiction of a *Priestess of Delphi* (1891) in this act, painted by John Collier, is held by the Art Gallery of South Australia; https://www.agsa.sa.gov.au/collection-publications/collection/works/priestess-of-delphi/25000/

[35] Robert Fludd, *Utriusque Cosmi Maioris Scilicet et Minoris Metaphysica, Physica, atque Technica Historia,* part of Brown University Library's Hay Exhibits (Providence), https://library.brown.edu/exhibit/items/show/19.

[36] Agrippa von Nettesheim Heinrich Cornelius, *Three Books of Occult Philosophy: Written by Henry Cornelius Agrippa of Nettesheim, Completely Annotated with Modern Commentary*, ed. Donald Tyson, trans. James Freake (St. Paul: Llewellyn, 1993), p. 339.

[37] The download process is automated with a cron job that runs a python script daily.

[38] NASA, *HORIZONS User Manual* (Washington: NASA, 16 August 2018), http://ssd.jpl.nasa.gov/?horizons_doc

[39] Graf, pp. 17-55.

[40] The first volume was published in 1925, followed by the second heavily amended version in 1937. I use the 1937 volume.

[41] W.B. Yeats, *A Vision: The Revised 1937 Edition: The Collected Works of W. B. Yeats*, ed. Margaret Harper & Catherine Paul (NY: Scribner, 2015), vol. 14, p. 54.

[42] Ibid., vol. 14, p. 60.

[43] Ibid., vol. 14, p. 57.

[44] Raine, p. 55.

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