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LAST SNOW:

AN ANALYSIS OF AN ORIGINAL

ELECTRONIC MUSIC SUITE

A Thesis

Submitted to the Mary Pappert School of Music

Duquesne University

In partial fulfillment of the requirements for

the degree of Masters of Music

By

Daniel Scott Landis

August 2013

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Daniel Scott Landis

LAST SNOW:

AN ANALYSIS OF AN ORIGINAL

ELECTRONIC MUSIC SUITE

By

Daniel Scott Landis

Approved July 15, 2013

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ABSTRACT

LAST SNOW:

AN ANALYSIS OF AN ORIGINAL

ELECTRONIC MUSIC SUITE

By

Daniel Scott Landis

2013

Thesis supervised by Professor Lynn Emberg Purse

Last Snow is a suite of compositions in a genre that most closely approximates a contemporary jazz style with electronic elements and shifting meters. While there are clear examples of imitative synthesis within the work, many abstract examples of a more diffuse, impressionistic bent are also discernible. Much of the programming for these last mentioned tonal colors and synthesizer leads was accomplished by the composer.

The suite has as a unifying feature the tones of the natural scale beginning from various alternate root pitches. The compositions, therefore, operate for the composer as something of a study with several challenges unique to each of the four resulting scales. There is a desire to more fully incorporate some concepts regarding synthetic chromaticism that the composer was considering during a month while he was

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convalescing in a hospital after a near fatal heart attack that was endured during the summer of 2009.

DEDICATION

This work is dedicated to my dear wife, Rose. While her husband was at death's door, she unselfishly gave all she possibly could, staying at my hospital bedside everyday from the wee hours of the morning into the darkness of the night, reading to and conversing with me whether I was able to respond or not. Her constancy buoyed me even when I was not consciously able to express my profound appreciation of her love. In this life, she is God's finest gift to me.

ACKNOWLEDGEMENT

I would like to thank Lynn and Bill Purse for their patience and support during this long process as I am convalescing and readjusting to my current situation as a heart transplant recipient. Knowing of their somewhat similar experiences helped me to continue, as well as causing me to appreciate their kindness all the more. I would also like to express my thanks to the young nurse who cared for me when I first awakened from my coma. Due to the medications with which I was being treated, I cannot remember her name, but her willingness to risk the possibility of stirring my ire by masquerading for several days as a composition student in order to help me to start using my brain after my coma was brilliantly empathetic. The conversations we had, spurred on as they were by her sensitivity to my situation, were responsible for keeping my mind on musically theoretical options while confined to a bed in the hospital. A number of the ideas planted while I was at Morristown Memorial found their way in more fully developed form into the work at hand.

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Prologue

For those who listen seriously to music or perform, it is likely that there are questions that arise from a consideration of the flow of musical progress. One such area of query arises from the history of jazz: how did we get from modal hard-bop to the avant garde? What were the paths travelled and were other productive trails ignored? This question has for quite some time been a topic of interest for this writer and he has attempted to work through some tentative answers in his suite *Last Snow* and its four component works ("Epic Brew", "Last Snow", "Red Monk", and "Song of the Goblin Child").

Historical Perspective

Of Miles Davis' two famous groups, it is arguably his second quintet with Wayne Shorter, Herbie Hancock, Ron Carter, and Tony Williams that most profoundly informs the contemporary approach to jazz conception currently. While it is admittedly the case that much of the paradigm that this group was heralding was linearly descended from the modal explorations first explored by Davis' sextet with John Coltrane, Julian "Cannonball" Adderley, Bill Evans (alternatively Wynton Kelly), Paul Chambers, and Jimmy Cobb on the ground-breaking album *Kind of Blue*, even a cursory listen of albums such as *Nefertiti* or *E.S.P.* establishes that the territory the second quintet was traversing was quite different from the relatively closely honed harmonic style of the first quintet. It seems clear that the second quintet was less constrained by traditional roles derived from the functions the individual players were to fulfill than was possible for the first group in the late 1950's. Melodically and harmonically, the subtlety of the entire group, but

especially as demonstrated by the interplay of Hancock and Carter and the compositions of Wayne Shorter, became emblematic of a new standard to be studied and imbibed by musicians for decades to come though the importance of the approach was not really appreciated when it was first recorded.

Davis' professional relationship with composer George Russell has been chronicled in many studies on the bandleader's life and work. After his partnership with Gil Evans, Davis' relationship with Russell is most likely the next important conceptual partnership that affected the trumpet player's paradigm. Russell's book, *The Lydian Chromatic Concept of Tonal Organization for Improvisation*, with its implications for a more thorough-going view of the relationship of melody to harmony in such a way that the melodic formation is in no way compromised to the harmonic structure of a tune yet almost inevitably ends up by simultaneously being wedded more closely to it while offering options for chromatic coloration, was a major conceptual shift for many, and the theory proved broad enough to support styles as varied as Davis', the approach of pianist John Lewis of the Modern Jazz Quartet with his relatively restrained neoclassicism, and John Coltrane's more direct, organic sound.

One of the scales that Russell discusses in his book, *The Lydian Chromatic Concept of Tonal Organization for Improvisation*, is a permutation of another scale more familiar to musicians: Russell's Lydian Augmented Scale is also known as the Natural Scale, the tonal difference being the note on which the scales begin. In fact, there are several other less commonly recognized scales that share pitches with the natural scale. Some of these scales are recognized only within the jazz community, others are

acknowledged within the classically-trained school as well. It is this family of scales which is the basis of our exploration.

The Scales in View and *Last Snow*

The four scales chosen as the basis for this suite are (in no particular order) the Natural Scale, the Altered Scale, the Hindu Scale (also known as the Mixolydian flat13 Scale) and the Lydian Augmented Scale.



Figure 1. The four scales reproduced in parallel fashion.

This writer has encountered jazz musicians who misunderstand the difference in the functions and tonal implications for these scales and attempt to "gloss" some or all of them into one construct. Simply put, the chromatic gravity for each of these scales is profoundly different largely because the nature of the voice leading inherent in the relationship of each tone to the root of each scale varies widely from scale to scale. One example may suffice. The "V-I" (and "V-i") cadence, where "V" is set one perfect fifth above the root, is recognized as a basic, even "the" basic movement in western harmony. Yet, out of the scales involved in our study, only two of the scales have this cadence as an option organic to the use of the scales, and even at that, the cadential use in both cases is altered to a "v-I." When superimposing a traditional western-style chromaticism, the first alteration we encounter is likely to be a change of the "v" chord to a full " V_7 " chord with all the subsequent harmonic implications that entails. This paradigm helps to open up to the composer and improviser colors from the imposed chromaticism that greatly enhances the harmonic variegation of a given work farther than the use of the tones of the nonstandard scale alone. In the case of the Lydian Augmented and Altered Scales, there is not a perfect fifth relationship occurring naturally within those scales so that the imposition of a "V-I+" relationship is even more of a intrusion at the level of a strict fealty to linear and harmonic considerations for this nontraditional scale and the harmonies that it entails, and yet, so strong is the movement that the resolution sounds contextually conventional.

This movement helps to pry open the harmonic door further to give the composer a greater justification for experimentation via the expansion of secondary dominants and other traditional chromatic techniques. The primary difference here is simply that the source material for these somewhat synthetic chromatic ventures is already "altered" to the ears of many. Oddly, the movement within the already perceptually embellished milieu is considered to further both extend and reinforce the apparent chromaticism in an aurally logical manner. One can begin to "expect" the imposed chromaticism as one learns the diatonic pitches of the parent scale.

This treatment has another rather fortuitous outcome: it helps to throw into fuzzier relief the line between melody and harmony. That there exist in the work large areas that can be easily analyzed as primarily harmonic or melodic in function is not to be denied, however, the richness of the scale material itself almost begs for a paradigm that is by

nature (and by turns) more sparse or thicker, depending on how the work has developed to a given point.

Two notes about Appendices 2 and 3 are necessary. These appendices are offered in the hopes that some of the delineation that this composer utilized in bringing these works into being is helpful to the reader. The harmonization of the scales follows the idea of the imposition of standard chromaticism as imported from historical theory; in this, there is no experimentation at all. In Appendix 2, however, there seems to be introduced an option that occurs via a harmonic "infirmity" based on the fourth degree of the C Natural Scale. If one extends the chord in triads above the F# which is the fourth degree of the scale, the two easiest analyses of the resultant chord that exists are analyses not at all readily produced in relation to its root note. One could correctly argue that the natural tendency of the scale is to produce just this sort of ambiguity. The placement of the perfect fifths in this chord seem to be the culprits in this weakness (off the third and ninth of the chord which is almost as far apart as could occur and still be retained within a two octave spread) and, not surprisingly, two more direct ways of analyzing the chord would seem to be as a D suspended fourth (with a b13) over an F3 bass or a Bb major 9 over an F# bass. Either seems preferable, though less systematic than the F# minor, flatted fifth (with a b9 and a b11) which is noted. The second appendix builds on the first and illustrates the way the chromaticism can be applied to all twelve tones of the chromatic scale with justification of the composer's hierarchy of chromatic import in view to the C Natural Scale.

Melodic use of the source material available in the scales was tailored to the feels attempted and was partially determined by the instrumentation and a strong conviction to

produce melodies that were idiomatic for those instruments. In each case in the individual works that make up the suite, there was at least one composer or work that was informing at some level the melody that was written. The influence of these predecessors was by design and serves as something of a touchstone for this writer, grounding the works, if ever so tenuously, in tradition.

"Epic Brew" has as its inspiration the tenor sax-trombone combination that made up the original line-up of the Jazz Crusaders. The tenor sax part is written squarely in the instrument's mid-range, while the trombone part is pitched in the upper mid-range to upper range of the instrument, rendering the melodic line, while somewhat technical, still very playable given the fact that the overtones fall as closely as they do. Within the conventions of alternate slide positions, most of the melody falls within the second, third, and fourth slide positions. The scale in which this melody is based is F Natural Scale.



Figure 2. The main theme for "Epic Brew".

"Last Snow," the song from which the suite derives its name is rooted in mood, thematic and harmonic material from a few ballads from Miles Davis' second quintet period of the 1960's, the most prevalent perhaps being Wayne Shorter's "Nefertiti." The piano part harkens back a bit further in the decade and texture, however, to Miles' recording of "It Never Entered My Mind," released New Year's Day of 1961. The E flat Lydian Augmented Scale is the group of tones most encountered in this song. The B sections do modulate up one half step and is oriented more around the E Lydian Augmented. Interestingly, the modulation of the B sections, although in the same scale family, seems to pick up the mood significantly. This begs the question of whether the root pitches of the two sections are playing upon a psycho-acoustic perception at some level.



"Red Monk," as the name alludes, attempts to envision what Thelonius Monk might have written for the band that recorded Miles Davis' *Bitches Brew*, if that ensemble was recording today. The work is something of a hybrid, showing elements of a "groove tune", but being more overtly composed in the traditional sense. The trumpet, guitar, soprano sax, and bass clarinet combinations filling out the melody most directly touch base with the *Bitches Brew* period. This melody is very simple, relying on the propulsion of its relation to the bass line and B section to bring movement to the work. The work utilizes the Altered Scale in E and exploits obvious use of the tritone.



Figure 4. The main theme and chords for "Red Monk".

The last of the works to be discussed, "Song of the Goblin Child," plays out in the D Hindu Scale. This scale is interesting in that, as the "alteration" (if it is fair to refer to it as such) occurs rather far up the scale from the root on the sixth degree. This seems to afford the scale more of a sense of consonance. This song has its antecedent in Chick Corea's "Children's Song." Later on (in 2000), this tune came to be known as "Children's Song No. 1," but the album that first featured the tune was *Crystal Silence* by Gary Burton and Chick Corea.







Figure 5. The main theme, comp, and bass for "Song of the Goblin Child".

Technical Considerations and Resource Utilization: Hardware

The computers used for the final project were all Windows based machines. Due to the length of time required to finish the degree, three computers saw service in bringing this project to completion. The first and second machines were both Windows XP based, while changes in the requirements of the software necessitated a final upgrade to an ADK i7 Quad Core Sandy Bridge computer with several TB of hard disk space and 16 GB of RAM running Windows 7, 64-bit. The audio interface utilized was originally an Echo Layla driving Event 20-20 BAS monitors. After the upgrade to the final ADK machine, the audio interface was upgraded to RME's Babyface with monitoring accomplished via JBL's MSC1 and Adam A7 and Sub8 speakers.

Controllers for this project were the Yamaha WX5 routed through an MCS2 (with 2 FC7 foot pedals) and Roland PK5, a Kurzweil MIDIBoard with 3.0 version software (likewise routed through the MCS2), and the Native Instruments Kore 2 controller (discussed in a paragraph below). While the composer does own an Alternate Mode TrapKAT, drum and percussion parts not generated by software were played on the MIDIBoard. This included percussion, single shots (such as cymbal crashes), and some fills.

The WX5 was the instrument used for virtually all of the electronic melodies and single note improvisations due to the interface's similarity to the composer's main instruments, the tenor and soprano saxophone. Perhaps interestingly, neither bass lines nor guitar melodies were performed on this instrument. The integration of the MCS2 with the WX5 was discovered years ago as this writer began programming the various hardware modules he was then using for wind synthesis. The MCS2 with its foot pedals allows for the programmer to separately address concerns for volume, timbre, and other parameters by permitting the utilization of CC02 and two other user programmable continuous controllers in the MIDI specification to address and modulate the necessary parameters in the synthesizer separately. The use of the MCS2 further offers the performer the ability to make adjustments for the assignment of the continuous controllers, enhancing the overall flexibility of the setup immeasurably.

The inclusion of the Roland PK5 particularly increased the expressive qualities of the sampled instruments running in Native Instruments Kontakt. In tandem with Sample Modeling's Trumpet and Trombone with their elaborate key switch programming, the use of the PK5 allowed for much more realistic emulation of these brass instruments as the switching covered many articulations and techniques idiosyncratic to the trumpet and trombone. Articulations such as scoops, glisses (both pitch up and pitch down), slides (again, in pitch both up and down), and scalar fall-offs were all performed via key switches triggered by the PK5. Note-end vibrato and some dynamics were also available via the key switch interface, though these were more usually performed with the WX5's pitch bend and breath control more directly. These last seem to be included by Sample Modeling more to help bridge the "expression gap" for those who are controlling the software from the keyboard.

The combination of WX5, MCS2, and PK5 was also very flexible in controlling both synthesizers with fully realized modulation matrixes and particularly those with less developed schemes. For synthesizers (Wave's Element, D16 Group's LuSH-101, and GForce's ImpOscar) that permit only one instance of a given controller to modulate a parameter at a time, the setup offered at least two other continuous controllers to be routed immediately, opening up the expressive field to further opportunities for greater malleability. When a synthesizer possessed a more robust modulation matrix (e.g., Tone 2's RayBlaster, kv331's SynthMaster, and Cakewalk's Z3TA+ 2), the WX5 as a singular unit could been viewed as somewhat apart from the MCS2 and PK5, as the use of continuous controller 02 could be routed to several destinations and have the effect of both its transmitted minimum and maximum values constrained to a predetermined level

in the software. While not strictly speaking necessary, the availability of this option in programming mitigated the need for undue performance modification, resulting in a more natural, less artificially restrained approach to performance of the music. All things considered, it is hoped that even more manufacturers begin to realize a more vigorous modulation matrix in the future.

All synthesizers, samplers, and other tone generators used on this project were software based; no purely hardware instrument was used (except the acoustic saxophones) and only two integrated hardware/software combinations currently exist in the composer's studio, one of which was used in one of the movements of the composition. These two bundles are Native Instruments' Kore 2 and Maschine. Kore 2 was used to great effect to very heavily tweak three of the patches used in "No Apologies" and coordinate the MIDI data multi-timbrally. While Native Instruments did finally fulfill its promise to release a 64-bit version of Kore 2, the unit is no longer supported by the company (professional and financial resources seem to have been redirected to Maschine). While much of the functionality of Kore 2 is represented in Maschine, not all of the "tweakability" has been imported, due to the exceedingly heavy demands placed on the engineers assigned to this responsibility within the Kore 2 platform. Many musicians have particularly lamented the demise of this product. It seemed to many that Kore 2's potential as a subordinate standard was just beginning to come into its own.

The soprano and tenor saxophones were both Selmer Paris Mark VI models (dates of manufacture 1978 and 1963 respectively), using Dave Guardala mouthpieces (a hybrid right-chambered model on soprano and a Michael Brecker II mouthpiece on tenor). Rico

Jazz Select Unfiled Reeds, strengths 3H and 3M were used on soprano and tenor respectively. Recording the saxophones was accomplished with a Rode Classic microphone (circa 1996) in an omnidirectional microphone polar pattern.

Technical Considerations and Resource Utilization: Software

The DAWs utilized for all the compositions were Sonar X1 and X2 Producer versions. While there was originally an intention to use Live 8, two considerations weighed heavily against its use. First, this writer does not tend to conceive of music in what could be reasonably referred to as a pattern-based paradigm. Second, and perhaps more decisively, through approximately March of 2013, Live 8 existed only as a 32-bit application. (For months prior, there was a very solid beta version of a 64-bit version of Live 8 available, but questions remained about using the test version for the final project.) As many of the plug-ins used are very heavily sample-based, too much effort potentially would have been lost freezing, archiving, and otherwise negotiating the RAM constraints of Windows XP and Windows 7 32-bit to be either effective or efficient. In some cases, certain plug-ins would have needed to be stricken from the project altogether. From this perspective, Sonar X1 and X2 with their more linear approach and 64-bit capability fit the composer's preferred style of composition much more closely. The feature set of the DAW was also well suited to the requirements of the composer. Many of the exigencies of the composer's approach, being grounded in the jazz idiom, negated the use of much of the need to overly quantize or otherwise adjust the feel of the work. Sonar acted then primarily as a computer-based recording and mixing device, only secondarily operating

as an editing tool (despite the availability of a rather robust set of tools for data manipulation within the application).

A full list of plug-ins exists in the appendix (see Appendix 1), complete with the role that the plug-in played in the composition and movement in which the plug-in occurred. It seems advantageous, however, to discuss the manner in which some of the plug-ins were utilized at this point in order to further clarify the approach directed to the composition process. Plug-ins used for both imitative and abstract purposes will be described.

Instrumentation, Part 1: Imitative Plug-ins

There exists an almost innumerable variety of plug-ins that seeks to emulate any number of real-world instruments. In practice, on the positive side, this can mean that the electronic musician is able to address almost any given compositional situation with a sound that most precisely fits the setting suggested. On the negative side, however, this musical cornucopia can result in a dearth of discernible individualized sound. To counter this pitfall, the present writer has consciously decided to limit the imitative choices available for his use. It is unusual, for example, in the "real world" for a pianist to decide to record on anything but his favorite brand of piano. Keith Jarrett, for example, prefers Steinways so much that he owns not one, but two such pianos: one American and one Hamburg instrument. Most, if not all, musicians would echo this behavior in their personal preference to record, if at all possible, only on instruments that are their personal favorites. With this being common practice, whenever emulation of a real-world instrument is required, an effort has been made to use virtual instruments that most sound

and/or behave as closely to an actual acoustic or electro-acoustic instrument as is currently available. A strong effort to keep abreast of trends, updates, and new releases has in the main been advantageous for the realization of the compositions.

The piano and electric piano software utilized is notable for the disparity of methods the respective programmers used in order to resolve the exigencies incumbent upon creating a convincing keyboard. Joseph Ierardi of Synthogy created an astoundingly detailed body of samples in order to create the Ivory 2 American Concert Grand, a sample instrument of a 1951 New York Steinway. A full 49 GB of samples with up to 20 velocity layers per note make up the core of this application. Both Una Corda and soft pedal performance samples at multiple velocity ranges are included. Perhaps even more impressively, the modeling of instrument resonance (a definitive apogee in the perception of engineers) was accomplished via DSP. Among other adjustments, parameters also exist within the software for the adjustment of the levels of pedal and key noise and five lid perspectives, although at this juncture, these last mentioned parameters usually have counterparts in other virtual instruments. The result of the sum of these is not just a virtual instrument of unprecedented tonal realism in emulating the acoustic piano, but an instrument that responds in very similar manner to an acoustic piano. In a recording situation, it is difficult to conceive of the ability to differentiate between an acoustic piano and this model.

Applied Acoustic Systems produced their Lounge Lizard 4 utilizing a Physical Modeling style of synthesis. While RAM is not put at a premium for this method, draw on the CPU is a bit heavier, but still, thoroughly within the realm of any contemporary computer. There is a depth to the tone here that, in similar manner to the Ivory 2,

includes the artifacts of tone production encountered in the acoustic world. Adjustment to hammer hardness and tine sidebands can be increased or decreased in the interface and manner of amplification can be traded at will for different effects and application. While there are sample-based virtual instruments that approach the Lounge Lizard 4's realism, the Lounge Lizard is unique in the smoothness of its response. Due to the fact that a method of synthesis was employed to create the tone, there exist no sample breakpoints in the usage of this application. Further, the "bark" that is so idiosyncratic of a real-world version of an electric piano when the performer strikes the keys with stronger velocity in the lower range of the instrument is convincingly emulated without any stepped quality; the bark continues to grow more insistent all the way through the dynamic range. While the present writer did keep options open as per the possibilities of other applications to fulfill the requirements for a realistic Fender Rhodes electric piano, most notably Native Instruments' Scarbee Mark 1 and Sonic Couture's EP73 (Deconstructed) for their fine emulations, in the end, the programmability of the Lounge Lizard was a boon for one of the compositions as well as its being flexible enough for when something a bit less imitative was called for.

Imitative acoustic and fretless bass sounds were supplied by Spectrasonic's Trillian and were sample-based. The fretless bass was particularly notable for the number of variations that were available in terms of processing, slides, and harmonics. In one movement, this writer ran six different channels of the fretless bass patches out of Trillian, all with an eye to constructing a convincing virtual fretless bassist. Stratocaster parts were produced by MusicLabs RealStrat 3, an application that allows for many guitar techniques (muting, harmonics, pinch harmonics, tapping and others) largely via

intelligently distributed key switches. Use of the sustain pedal is particularly well implemented in that it is possible to sustain several notes of a chord while bending one note that is being held on the keyboard. Amplifier simulation was accomplished via Native Instruments' Guitar Rig 5 and was generally limited to gently tweaked presets. Guitar, fretless bass, and acoustic bass patches were all performed from the keyboard as opposed to the WX5.

Imitative brass and bass clarinet sounds were supplied by the afore-mentioned Sample Modeling applications. These exist in two formats: the brass all run under Native Instruments' Kontakt 5 with the key switches programmed for alternative articulations and techniques. The saxophones and clarinets utilize Sample Modeling's proprietary SWAM (Synchronous Wavelength Acoustic Modeling, developed by Stefano Lucato) engine which allows for modulation based more on the use of continuous controllers. Both the Kontakt and SWAM-based instruments excel in their optimization for wind controllers such as the WX5. Crescendi are smooth, betraying no switching of samples whatsoever, be they on an extended single note or across a very long slurred line. Standard articulations respond very well also to the WX5, whether of a gentle or more abrupt persuasion.

Drum sounds, of full acoustic drumset or electronic kit were derived from one of three sources. BFD 2 from FXPansion was the application most given to purely imitative sounds. Spectrasonic's Stylus RMX was utilized for sampled-based, but somewhat impressionistic styles, somewhere between a purely realistic and fully synthesized or processed percusssive approach. FXPansion's Tremor was used for those drum sounds most electronic in nature. All had their individual strengths which melded well with the

demands of the movements in which they occurred. Further "non-pitched" percussion were derived from Image Line's Ogun, a synthesizer optimized for sounds containing a metallic component, and Native Instruments' Kontakt 5 running Discovery Series: West Africa and Sonic Couture's Tinglik. Ogun straddles the imitative/synthesized divide, while both West Africa and Tinglik are thoroughly imitative in nature. Tremor and Stylus will be discussed later in this document.

In BFD 2, this writer set up a drumkit based around samples from Yamaha Maple Custom Absolute samples. The snare was a Yamaha Roy Haynes signature copper snare sampled being played by sticks with snares both on and off. Toms were the aforementioned Maple Custom Absolute in three sizes: 10 inch, 12 inch, and 16 inch floor tom, sampled being played with both sticks and mallets. The bass drum was likewise a Maple Custom Absolute, sampled with both wood and felt beaters, though wood was primarily used. In the toms and bass drum, though a 14 inch floor tom and a 20 inch bass drum was available, the decision to build the kit with the larger drums (16 inch floor tom and 22 inch bass drum) was made in the effort to produce a slightly more expansive sound to complement the overall darkness of the work in its general tone. Cymbals employed were all Avedis Zildjian with the exception of one 20 inch Bosphorus Master's Series Flat Ride. All samples were utilized with sticks only except where noted. These included a 22 inch Z Series Custom Ride (samples with both sticks and mallets), a 22 inch China Boy Crash, a 20 inch Custom Crash, 16 inch Custom Crash, a 10 inch Custom Splash, and a 15 inch Z Custom Mastersound Series Hihat.

Patterns enlisted for this project were the Virtually Erskine MIDI Groove Library for BFD2 performed by Peter Erskine from Platinum Samples. Editing was minor;

basically, the swing eighth notes on the cymbals were often edited out so that the feel was a bit more contemporary. Eighth notes that might fit into a swing feel on the drums, however, were not edited as they helped to produce a rounder, slightly polyrhythmic feel. This writer also often clipped together parts of patterns to help further alleviate a sense of patterning. Generally, when BFD2 was utilized, one of the first considerations was to ensure that the parts did not sound as though they were produced by a drum machine. Extra crashes and fills were added to complete the part.

Instrumentation, Part 2: Non-Imitative Plug-ins

Most of the programming for this project occurred in the categories of pads, drums, and leads. While the programming for the pads could be categorized as being foundational to the patch, most of the lead programming would be classified as extremely heavy tweaking. Two patches and two drum plug-ins will be discussed.

Izotope Iris is a recent entry that uses a particularly graphic paradigm to encourage those who like to explore its depths. It has been characterized by some who use it as a "happy accident" application. This writer isn't entirely sure that this description is accurate as it could be as the interface includes tools to rectify any edits that do not meet expectations. A fairer comparison would likely be to sculpture: one begins with a sound source (up to three layers and a sub wave can be used) and carves into a visual representation of the frequency of the sound various with tools similar to those offered in graphics editing programs to isolate strata of sound across the layers. Editing of the product resulting from the carving and chipping follows at that point much along the same lines as that of subtractive synthesis. Amplitude ADSR envelopes and an LFO

routable to pitch, amp, or pan are available to shape the sound per layer. Glide between notes and modulation routing is adjustable for the patch, as is a Master Effects section. Each layer, however, in the mix section has a send to the Master Effects, so if one does necessarily want a deep chorus on, say, the third layer, this can be adjusted to a value of zero. There is a filter to attenuate frequencies in the higher ranges and can be used to mitigate the effect of the other parameters.



Figure 6. Main window of Izotope's Iris. Note the synth section on the right hand side of the screen.

This writer has found Iris to be a flexible and rewarding pad generator. For those who do not sample, there is offered from Izotope a huge collection of samples in several categories, both musical and found real-world, and both packaged with the application and offered as aftermarket. There are the classifications that one would expect such as "Instruments," "Vocals," and "Hybrid Textures," but there are unanticipated groups with

labels such as "Toys," "Environment," "Food," and "Wood." Exploring these gives an idea of the thought that went into how the interface is laid out and just how well-attuned the application is to the needs of the composer.



Figure 7. The modulation matrix window of KV331 Audio's SynthMaster 2.5.

Lead sounds, played as they were from the WX5, all needed very heavy tweaking of the modulation routing. Almost all synthesizers are released without a single lead patch optimized for wind synthesis (Thor in Propellerhead's Reason is one happy exception to this oversight). Thankfully there has been a move towards including extensive modulation matrices in many software synthesizers. In the tweaking that is most advantageous for wind synthesis, it is almost a foregone conclusion that one will begin with setting volume, filter cutoff, or both to be controlled by Continuous Controller 02 (breath control) in the MIDI specifications. While it is possible rout the desired controller to aftertouch (and it is possible to set the WX5 to send the same), CC02 is optimized to respond better to breath and generally gives more of whatever effect for which it is being exploited when used as a controller. Within the modulation of the tone, often there are options for frequency and resonance. Particularly in this instance, it is advantageous to have threshold knobs or sliders to control both the topmost possible level of a given modulation and lowest level achievable. This sort of tailoring allows for the wind synthesist to be just that more precise in the initial tone sculpting and often allows for more freedom in the performance.

It should be noted as well, that while the obvious routing for CC02 is to control volume, it is not always helpful so to do. Synthesizer leads that seek to emulate vintage synthesizers in particular may want to avoid this routing as older synthesizers did not easily control their volume during leads. When one considers that the typical lead synthesist had one hand on the keyboard and the other on the pitch wheel and the average vintage analog synthesizer did not have the capability of aftertouch yet, one can easily see the benefit in ignoring this possibility at least occasionally. Other parameters can be also be controlled to great effect with breath control, but these are often proprietary to the synthesizer being tweaked. If more than one oscillator is being used in a patch and the synthesizer allows for this in the modulation matrix, often one oscillator's amplitude can

be set to respond with a positive value and the other set to modulate with a negative value resulting in cross-fading between the oscillators.



Figure 8. The Chaos Designer window in Spectrasonics Stylus RMX.

Properly tweaked, Spectrasonics Stylus RMX is capable of some of the more expressive, least mechanical-sounding drum patterns of any drum package this writer has had the pleasure to use. There are two reasons why the application is capable of this. First, the presence of the Chaos Designer is quite a boon in this regard. The present writer used the chaos feature to create section patterns that had the feel of the original pattern and exhibited much less sheer repetition, with much more Chaos Designer influence that could be cut into smaller parts to create convincing fills. In this manner, the unwieldy quality that permeates much of the output of Chaos Designer, actually becomes one of the application's more endearing strengths. For example, in "Red Monk," in order to achieve the Bayou funk feel that became so important to the first part of the work, chaos designer used some significant doses of pattern and repeat on "Tyrant Mix," while utilizing just a touch of rush timing and loud dynamics. The second feature exploited to produce this groove was the Groove Lock Feel template, which was set to Bayou. In a like manner, the feel of "Epic Brew" was even more radically established by using a Groove Lock Feel template on the 11/8 and 13/8 measures.



Figure 9. FXPansion's Tremor. Note the white arrows in the grid occurring under the number "11". These determine the length of a pattern and can be set individually per instrument.

Tremor, from FXPansion, is billed as a polyrhythmic drum plug-in. While based on a typical drum machine pattern grid, one important difference exists: each instrument can receive its own pattern length independent of any other instrument or instruments in the pattern. Furthermore, there are templates available with rhythmic patterns that can be overlaid on each track and further edited for the composer's needs. The sounds, which are synthesized with the same synthesis engine as used in DCAM: Synth Squad, are very high quality and suggestive of synthesis rather than sampling, and editing opportunities of basic parameters exist for the sounds on the kit page, or if one has the predilection, one can tweak and synthesize one's own sounds on the synth page. Since "Song of the Goblin Child" is almost entirely based in abstract sounds, Tremor's tonal palette fit beautifully into this composition.

Conclusions

The possibilities for using traditional style chromaticism on non-traditional material seems very open yet; only the surface has been scratched with this work and opportunities certainly exist for a more fully realized polyrhythmic component to be added into the mix. There exist many more scales and other scale families that may benefit from this approach, e.g., attempting the application of this style of chromaticism on a synthetic symmetrical scale should prove engaging. Interestingly, this paradigm may actually yield another benefit: there may be a way within this approach to finally address the tonal vocabulary of the late 19th and early 20th centuries in a manner that is more analytically true to the material. The reference here is to something that Dmitri Tymoczko noted in his *Geometry of Music*: "The chromatic music of the late nineteenth century continues to be shrouded in mystery. We have no systematic vocabulary for discussing Debussy's early 20th-century music or its relation to subsequent styles." The application of this technique on scales with alternate tunings is a very real possibility, as many synthesizers now sport this ability in their feature set and the paradigm may show

itself to be an area with promise. This writer is looking forward, the Lord willing, to exploring many of these avenues in the future.

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Appendix 1: List of Utilized Synthesizer Plug-ins

Category Key: Emulative (E), Semi-emulative (S), Non-Emulative (N)

Function Key: Ambient (A), Bass (B), Bell (Bl), Brass (Br), Drums (D), FX (FX), Guitar

(G), Hits (H), Keyboards (K), Lead (L), Pad (P), Percussion (Pr), Rhythmic (R), String

(S), Voice (V), Woodwind (W)

<u>Composition Key</u>: "Epic Brew" (EB), "Red Monk"(RM), "Last Snow" (LS), "Song of the Goblin Child" (GC)

Manufacturer	Category Plug-in Name Use Function		Function	Composition Key
Applied Acoustic Systems	Chromophone	S	Pr,R	RM,GC
Applied Acoustic Systems	Lounge Lizard 4	E,S	К,	EB,LS,GC
Cakewalk	Z3TA+2	Ν	L	EB
Camel Audio	udio Alchemy		A,V	EB,RM,GC
D16 Group	LuSH-101	Ν	L, P	SG
FXPansion	BFD2	Е	D	LS
FXPansion	Tremor	Ν	D	GC
GForce Software	ImpOscar 2	Ν	P, A	LS,GC
Image Line	Ogun	S	Pr, H	EB,RM,LS,GC
Izotope	Iris	Ν	А	RM,LS,GC
KV331 Audio	SynthMaster 2.5	Ν	L, P	RM,GC
MusicLab	RealStrat	Е	G	RM
Native Instruments	Absynth	Ν	B,H, Bl	EB
Native Instruments	FM8	Ν	Pr, R	GC

Appendix 1: List of Utilized Synthesizer Plug-ins (continued).

Category Key: Emulative (E), Semi-emulative (S), Non-Emulative (N)

Function Key: Ambient (A), Bass (B), Bell (Bl), Brass (Br), Drums (D), FX (FX), Guitar

(G), Hits (H), Keyboards (K), Lead (L), Pad (P), Percussion (Pr), Rhythmic (R), String

(S), Voice (V), Woodwind (W)

<u>Composition Key</u>: "Epic Brew" (EB), "Red Monk"(RM), "Last Snow" (LS), "Song of the Goblin Child" (GC)

Manufacturer	Plug-in Name	Plug-in Name Category Function		Composition Key
Native Instruments	Kontakt 5	Е	Br,W,Pr	EB,RM,LS
Native Instruments	Massive	Ν	L,B,	EB,LC
Native Instruments	Reaktor 5	Е	L	RM
Ohm Force	Symtohm Melohman	Ν	Н	GC
Rob Papen	SubBoomBass	Ν	В	GC
SampleModeling	The Trumpet	Е	Br	RM,LS
SampleModeling	The Trombone	Е	Br	EB
SampleModeling	The Bass Clarinet	Е	W	RM
Spectrasonics	Omnisphere	Ν	B,H,P,Br	RM
Spectrasonics	Stylus RMX	S	D	EB,RM
Spectrasonics	Trillian	Е	В	RM,LS
Synthogy	Ivory 2	Е	K	LS
Tone2	ElectaX	Ν	Р	LS
Tone2	Gladiator 2	Ν	Н	EB

Appendix 1: List of Utilized Synthesizer Plug-ins (continued).

Category Key: Emulative (E), Semi-emulative (S), Non-Emulative (N)

Function Key: Ambient (A), Bass (B), Bell (Bl), Brass (Br), Drums (D), FX (FX), Guitar

(G), Hits (H), Keyboards (K), Lead (L), Pad (P), Percussion (Pr), Rhythmic (R), String

(S), Voice (V), Woodwind (W)

<u>Composition Key</u>: "Epic Brew" (EB), "Red Monk"(RM), "Last Snow" (LS), "Song of the Goblin Child" (GC)

Manufacturer	Plug-in Name	Category Use	Function	Composition Key
Tone2	Rayblaster	Ν	L	GC
Tone2	Saurus	Ν	Р	LS
U-he	Diva	Ν	R,P	RM,LS,GC
U-he	Zebra 2	Ν	Br,P	EB,GM
U-he	Zebra HZ	Ν	P,K	LS, GC



Appendix 2: The Natural Scale and Primary Alternate Harmonizations

Appendix 3: The Natural Scale and Secondary Alternate Harmonizations on the Chromatic Tones.

