1991

ALIAS 610

James David Stewart
San Jose State University

Follow this and additional works at: https://scholarworks.sjsu.edu/etd_theses

Recommended Citation

Stewart, James David, "ALIAS 610" (1991). *Master's Theses*. 217.
DOI: <https://doi.org/10.31979/etd.xnmb-r423>
https://scholarworks.sjsu.edu/etd_theses/217

This Thesis is brought to you for free and open access by the Master's Theses and Graduate Research at SJSU ScholarWorks. It has been accepted for inclusion in Master's Theses by an authorized administrator of SJSU ScholarWorks. For more information, please contact scholarworks@sjsu.edu.

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

U·M·I

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 1345824

Alias 610. [Original composition]

Stewart, James David, M.A.

San Jose State University, 1991

U·M·I

300 N. Zeeb Rd.
Ann Arbor, MI 48106

ALIAS 610

A Thesis

Presented to

The Faculty of the Department of Music

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

By

James David Stewart

August, 1991

APPROVED FOR THE DEPARTMENT OF MUSIC

Professor Allen Strange

Dr. Brent Heisinger

Dr. Pablo Furman

APPROVED FOR THE UNIVERSITY

ABSTRACT

ALIAS 610

by James David Stewart

Alias 610, a work for solo violin and tape, is a composition firmly grounded in the Fibonacci sequence. The Golden Mean, a proportional relationship derived from this summation series, strictly controls the sectionality of *Alias 610*. The lengths of all sections are derived from the Fibonacci sequence. Aside from these proportional relationships, and perhaps more importantly, *Alias 610* makes use of three techniques of macrodynamic sonic manipulation. They are the use of a pre-determined series of electronic voices, the use of MIDI (musical instrument digital interface) continuous controllers 98, 99, and 6 addressing real-time instrument parameter changes, and the use of raw system exclusive data. Each method controls the macrodynamic changes in timbre of a single instrument which in turn exhibits varying degrees of microdynamic sonic change. These changes, both micro and macrodynamic, are then fully exhibited in the graphic representation of the taped material. It is these aspects of proportion, micro and macrodynamic control and the appropriation of graphics according to sonic properties, that the accompanying paper explains.

TABLE OF CONTENTS

	Page
ABSTRACT	iii
INTRODUCTION	1
HISTORICAL PERSPECTIVE	1
The Golden Mean	
Dynamic Voices	
PROPORTION AND TONAL ANALYSIS	5
Large Divisions	
Small Divisions	
Tonal Analysis	
TIMBRAL INVESTIGATION	8
Overview	
Micro and Macrodynamics	
Patch Micro Dynamics in Alias 610	
Patch Objectives and Methods of Macro Dynamics	
Strengths and Weaknesses of Each Controlling Method	
THE SCORE	16
Overview	
Use of Traditional Notation	
Appropriation of Graphics According to Sonic Properties	
SUMMARY	22
NOTES	23
BIBLIOGRAPHY	24

INTRODUCTION

Roger Sessions believed music theory and analysis often obscures the very music its proponents claim to clarify, and when one attempts to describe a personal creation through the logistic means of music theory, verbal analysis can seem coldly academic. Nevertheless, formal analysis provides access to tools, procedures, and formal organizations that allow composers to learn from one another. With that attitude in mind, the following discourse will describe the composition for solo violin and tape, entitled *Alias 610*, in four distinct sections: historical perspective, proportional and tonal analysis, timbral investigation, and the graphic representation of the tape material. One intent of this paper is to draw various conclusions concerning formal organization and modern scoring techniques; however, the main focus will be to discuss various methods of timbral manipulation.

HISTORICAL PERSPECTIVE The Golden Mean

It is undeniably true that the formal organization of *Alias 610* was influenced by the works of Bela Bartok, or more specifically by the theoretical works of Erno Lendvai concerning the works of Bartok. Thus, to best understand the temporal organization of *Alias 610*, one must first understand the concept of the Golden Section.¹ The Golden Section is simply the division of an entirety so that the proportion of the larger section to the whole is equal to the proportion of the smaller section to the larger. More formally, $x = x : (1-x)$. This proportion is roughly $2/3$ or 0.618 times the whole, thus making the

smaller section 0.618 times the larger section or 0.382 times the whole.

Although this may appear confusing, a simple illustration should help clear matters (fig. 1).

Fig. 1. An Example of the Fibonacci Relationship.

This proportional phenomenon was first documented in Euclid's Elements where it was defined as the extreme and mean ratio, as was shown in fig. 1. Furthermore, any fixed length can be divided twice into Golden Section ratios, thus creating a symmetrical subdivision of the whole (fig. 2). For example, lines AD and BC are symmetrical around point (x) iff lines AC and BD are equal to 0.618 of line AD and lines AB, BC, and CD are equal to 0.382 of line AD, to the nearest whole number value. It is this whole number approximation of Golden Section proportion that is found in the summation series known as the Fibonacci numbers.

A summation series is a series of numbers in which any number in the series is equal to the preceding two numbers. Therefore, the Fibonacci sequence is 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 . . . , and any number divided by the following number will be an approximate Golden Section proportion. For example, 55 divided by 89 equals 0.6179. This series of numbers is

uncommon to synthetically produced substances, but it is frequently found in natural substances.

Fig. 2. A Symmetrical Subdivision Using Fibonacci Relationships.

One of the most pristine examples of this can be found in both pine and fir cones. In these specimens the number of logarithmic spirals from the center outwards in both the clockwise and counterclockwise directions represent the Fibonacci series. Other natural displays of Golden Section proportion can be found in sunflowers, which have 34 petals and logarithmic spirals with the values 21, 34, 55, 89, and 144. Because these mathematical structures exist on an organic level, it is not so surprising to also find them in man-made objects such as art, for we know that man's basic ideas are generated through the perception of surroundings, and that these perceptions generally result in adaptive behavior that usually closely resembles the physical world itself. Therefore, it is not so surprising to find these proportional structures in all art, including music.²

It is well known that both Medieval and Renaissance composers were well aware of Golden Section proportion. Furthermore, music of the Classical Style often employed 2+2, 4+4, and 8+8 symmetrical phrasing to create larger units of symmetry. It was not uncommon for these phrasings to

be shortened by a bar or overlapped in the final measure of a phrase, thus displaying Fibonacci relationships. It is not without a long, although undernably obscure, history that symmetrical values of the Fibonacci series stringently govern the proportions of the composition for solo violin and tape, *Alias* 610.

Dynamic Voices

Earlier practices influenced other conceptual criteria such as the use of dynamic voices, that is, voices that change over time. The thought of slowly opening a filter to change timbre, gradually detuning an oscillator, or changing the envelope of the amplifier in real-time has from the advent of the electronic oscillator intrigued composers of electronic music. A prime example of this can be found in the center of Stockhausen's *Kontakte*, in which a pulse wave having a definite pitch is gradually lowered in frequency until pitch is no longer a factor and the individual pulses are perceived. The filter setting is then manipulated so as to strengthen the resonance frequency, producing pitch and creating a pedal upon which a large section of the composition is placed.³ Through the study of this piece and others, it becomes clear that dynamic voices can be described in two distinct ways: evolving within pre-programmed parameters of sound (henceforth termed microdynamics) or mutating due to external messages (termed macrodynamics) such as those sent by MIDI. Nevertheless, earlier electronic composers were without MIDI and thus devoid of some very powerful tools in the development of macrodynamic voices.

More specifically, MIDI provides the composer three avenues of real-time manipulation: patch change information to utilize a predetermined series of patches, continuous controller information addressing real-time instrument parameter changes, or raw system exclusive messages. With the use of dynamic voices being a central theme, and MIDI providing three avenues for macrodynamic development, it became a goal for this piece, and substantively for this paper, to explore the strengths and shortcomings of each method. Before a comparison can be made, however, a description of both the formal structure and tonality of this piece is in order.

PROPORTION AND TONAL ANALYSIS Large Divisions

Alias 610 is in a quasi-sonata form with the proportions of all sections being related to the Fibonacci sequence (fig. 3). The entire composition, which is 610 seconds in length, finds its midpoint at 305 seconds, which is musically punctuated by the beginning of the violin *saltando* as well as the equidistant relationship between the beginning and end of the B section. The beginning of the raucous transition to B' is found at the 377 second point which is roughly two-thirds the entire 610 second length. Likewise, the B section begins with a distinctive sound that is only heard at this point in the work, 377 seconds from the end of the piece, and clearly defines the 305 second mark as an important point of symmetry (fig. 4). Even as these larger proportions of overall formal structure are articulated, so are smaller points of detail such as the inner workings of each large section.

Fig. 3. The Overall Sectionality of *Alias* 610.

Fig. 4. The Exact Center of *Alias* 610.

Small Divisions

The entire A section totals 144 seconds and can be divided into four distinct musical ideas: a 34 second introduction, a 21 second first group idea followed by a 34 second transition to a 55 second second group. It must be noted that the 55 second mark is shared by the last beat of the canonic first group and the first beat of unison transition, as is the 89 second mark by the last beat of the transitional section and the first beat of the second group. The 72 second point of symmetry is made clear by the violin's double stop fourth and fifths at measure 19, a voicing found nowhere else in the piece. There are

many subtleties throughout this opening passage as well as the entire composition that are all related to the Fibonacci sequence and it would be pointless to expose every detail. However, just as the formal proportions are governed by the Fibonacci sequence, so is the tonal scheme, and a brief example is apt.

Tonal Analysis

The overall tonal scheme serves to clarify all proportional relationships. Both the A and the A' sections have a common cell content, while the B and the B' sections utilize a twelve-tone row derived from the material in the opening A section. Not only does the thematic material and treatment make use of the Fibonacci sequence as an organizational tool, but the tonal language of each section also serves this purpose. Upon closer examination, each large section's tonal organization can be subdivided into smaller Fibonacci proportions. A closer look at the opening A section will serve as an example.

The cell content of the A section is introduced in a way that not only spells out the twelve-tone row of the B and B' sections but also highlights the Fibonacci relationships so inherent in this piece. The entire row (03214567E89T), with $C = 0$, is broken into four cells of three notes: (032), (145), (67E), and (89T) which are realized both vertically and horizontally. For example, the 34 second introduction is governed by the cell (032) which is spelled out in the first two bars of the piece. Likewise, the second cell (145) is first introduced at the outset of the 21 second canon. Following the 34 second transition, the third and fourth cells (67E) and (89T) are introduced at the

outset of the second group by the lowest two electronic voices which though not strongly pitched do show some strength to a fundamental frequency and are therefore justified in this role. The strength of the electronic voices is found in the transitional sections, measures 37- 64 and 127-209, which are far more timbrally involved.

TIMBRAL INVESTIGATION

Overview

During the transitional sections the emphasis is on timbre and the control of timbre over time rather than on the development of melodic or harmonic material. It is here that most of the manipulatory experimentation takes place through the use of patch change messages, continuous controller 98, 99 and 6 information, and raw system exclusive data. The discussion of these manipulatory techniques will be divided into four parts: the definition of the terms micro and macrodynamics, the microdynamics of each patch, the patch objectives and methods of macrodynamic control used for each patch, and the strength and weakness of each controlling method.

Micro and Macrodynamics

The term microdynamics refers to any change that occurs within a pre-programmed patch within the duration of a single note on/note off message, i.e., changes that are internal to the patch parameters. For example, a filter's cutoff frequency might be programmed to rise over time, thus causing the

sound to evolve from dull to bright; an increasing amount of low frequency oscillation (LFO) can be fed into the filter to create "wah-wah" effects; or two oscillators can be detuned and given different envelopes so that a resultant beating effect is delayed. Obviously, the boundaries and methods of microdynamics are as endless as the results are valuable. In fact, technology such as Vector synthesis, Linear Arithmetic synthesis, and modern sampling techniques has made microdynamic exploration increasingly more accessible as well as rewarding.

The term macrodynamics refers to changes that can occur over an extended period of time and in which those parameters that affect timbre are controlled by external means. Examples might include a patch change which utilizes a predetermined patch chain so that one aspect of the sound such as the level of the noise source is gradually diminished, a series of controller messages which adds a noise source while changing the wave form from a sine to a sawtooth, or a string of system exclusive messages which increases the cutoff frequency while it lengthens the attack of the DCA. The two terms micro and macrodynamics are only differentiated by the means of access to parameters which cause mutation, whether it be internal or external to the patch itself.

Patch Microdynamics in Alias 610

The tape part in *Alias 610* contains three electronic voices programmed on a Roland D-550 Linear Arithmetic synthesizer, an Ensoniq ESQ-1 Wavetable synthesizer, and a Roland JX8P Subtractive synthesizer, with all

three voices being highly microdynamic throughout all stages of their macrodynamic development.

The D-550 patch, the most flamboyantly microdynamic, is composed of two PCM (pulse code modulation) noise sources. One source which has an immediate attack and a fairly quick release serves as a pedal to the sound while the other noise source, a white noise sample, with a much slower attack and a longer release, gradually fades in and out, creating a breathy quality. Similarly, the ESQ-1 patch is created by layering two different patches, these being similar to a bell and a solo violin. In this patch, the bell-like sound has an immediate attack and a filter setting which closes down fairly quickly toward the end of the sound. The string sound has a much slower attack and is programmed to appear at the same point the bell subsides, thus using a common cross-fading technique. Unlike the first two sounds the JX8P patch is not layered and therefore the microdynamics are far more subtle, being found in the envelope for the filter which has a fairly quick decay time causing the filter to partially close after the initial attack. The result of this filter setting when coupled with the rest of the parameters is a uniquely human vowel sound that actually changes formats according to the pitch controller, an interesting circumstance which is worthy of investigation but beyond the scope of this paper. It must be made clear that each description of microdynamics is based on the original patch which in turn displays various degrees of macrodynamics throughout the piece.

Patch Objectives and Methods of Macro dynamics

The patch macro dynamics in *Alias 610* is of course different for every patch as is the method used for this purpose. For example, the D-550 undergoes a series of mutations that eventually extract and then replace the harsher of the two noise sources. Because of the availability of Opcodes D-50 editor/librarian, which makes patch editing on the D-550 extremely easy, a patch chain was set up specifically for this task. The concept behind this patch chain was one of subtlety; thus the increment of change, which had to be minute, became a series of twelve patches which gradually removed and then replaced the specific noise source. The creation of this chain was simple enough, but the nature of realtime patch changes made the musical implementation a bit more challenging.

Similarly challenging and certainly further reaching were the macrodynamic changes concerning the ESQ-1. This voice, the most pitched of the three electronic voices, undergoes two series of dramatic changes. In the first instance, the bell sound becomes longer, brighter, and layered with noise. In the second instance, this now bright and noisy sound becomes low and muffled. Continuous controllers 98, 99, and 6 were used to control the necessary parameters. The methodology was fairly simple: put the sequencer in record mode and begin recording, address the desired parameter by physically pressing the correct buttons, change the value of the parameter with the edit slider or button, and make all necessary corrections in the sequencer's event list (this usually entails changing the value of controller number 6). Of course the same results could be attained by typing the data

directly into the event list. The difficulties associated with either method were certainly more musical than technical. More clearly, one had to be acutely aware of the order in which the parameters were manipulated and to what extent these parameters affected the sound. It is only with the clear establishment of these relationships that one could proceed with appropriate subtlety.

This statement of relationships and subtlety also holds for the final method of computing and entering raw system exclusive data used to control the macrodynamics of the JX8P. These changes, unlike those for the ESQ and D-550, occur during the B as well as the transition to B' sections and were certainly more technically challenging than the previous two methods. The reasons for this increase in difficulty were two-fold: first, all of the information had to be entered in hexadecimal, which quickly became routine; second, the data string of system exclusive information had to be correctly organized.

It must be noted that Vision from Opcode Systems is one of the the only sequencing programs that allows real-time individual parameter manipulation using system exclusive information. In order to facilitate this, Vision provides its user with a system exclusive edit window into which all the hexadecimal code can be typed and edited. The "morgify" icon in the event list editor provides the easiest use and perhaps most convenient access to this window, which can edit events up to 10,000 bytes. Even though most system exclusive messages which edit a single parameter, as opposed to bulk dumps, are only in the ten to twenty byte range, it is best to keep each string of messages for each synthesizer on its own track.

The data string for the JX8P, given quite clearly in a number of sources, was ten bytes of information (fig. 5). Obviously, this information only has three variables: MIDI channel number, parameter number, and the value assigned to that parameter. In the first instance, the MIDI channel number is simply the desired MIDI channel minus one, thus MIDI channel three is being addressed in the example below. In the other two cases, the parameter numbers, their corresponding functions, and possible values are listed in both the JX8P manual and other commercially available sources.⁴ Once these variables have been defined, the data string is extremely easy and versatile to use and the problems become musical rather than technical.

Fig. 5. System Exclusive Data String For Roland JX8P.⁵

In the transition to B' the overall attack of JX8P voice is lengthened while the filter goes from being halfway to completely open. In order to smoothly complete this transition the filter setting had to be nudged upward by increments of one, a fairly tedious task made easy by Jester, another Opcode product completely devoted to system exclusive operations. This piece of software, developed by Aaron Nelson, allows the user to address a specific parameter by typing in the appropriate system exclusive header and, using a standard Macintosh pencil routine, draw in that parameter's value and changes over time. Once this is satisfactory, the document can be saved as a standard MIDI file and exported to any sequencer, where it becomes part of the appropriate system exclusive track, and eradicates the musical problem. It is this kind of control that makes the seemingly tedious task of organizing and entering system exclusive data well worth the effort.

Strengths and Weaknesses of Each Controlling Method

Even before comparison, it is obvious that each of the three controlling methods can perform exactly the same tasks, and each use system exclusive information. The differences lie in method rather than result, and thus choosing a method becomes purely subjective. Still, each method exhibits various degrees of simplicity and effectiveness when applied in certain situations. For example, the patch change method which was used for the D-550 worked well in that situation. This was due to the fact that an Opcode Editor/Librarian was available, the changes were focused on one particular aspect of the sound, and the increments of change could be large without

being audible. A considerable number of patches would have resulted if the same method had been used for the ESQ which was subject to further-reaching mutation. Similarly, the amount of scrolling due to the deep layer of pages found on the D-550 would have made the continuous controller method unviable.

In the case of the ESQ, which has a well-labeled and separate button for each parameter, the controller method was well suited. Because this method entailed the physical recording of each parameter change, the ergonomics of the ESQ made this simple. The assignment of the parameter's value was easier done in the event list editor using controller number 6 than by attempting to assign the value while recording in real-time.

Even though the continuous controller method was by far the most convenient, the nature of change in the JX8P, a filter setting which needed to be scaled, made physically recording that change jagged and physically entering the data tedious. The use of raw system exclusive data aided by appropriate software such as Jester made these changes easier. Also, the use of Vision's system exclusive window made this method appear the most controlled. The best possible solution would be the combination of all three controlling methods utilized when they are most appropriate: the patch change method when the focus is on one aspect of sound and the increment of change can be fairly large, the continuous controller method when the intended keyboard facilitates quick and easy editing, and the final method of entering system exclusive code when there are aspects of change that musically need to be scaled in small inaudible increments. Likewise, this idea of picking and choosing methods according to musical situation can be

applied to the scoring of this piece as well as the implementation of macrodynamics.

THE SCORE Overview

Ever since the visionary Edgar Varese composed *Deserts* (1949-54), a pioneering work in the electronic medium, music composers and performers have been faced with the potential problem of notating this new art form. It was obvious from the beginning, in works such as Ussachevsky's *Sonic Contours* and Otto Luening's *Fantasy in Space*, that traditional notational practice would not properly represent this new form of music that was much more interested in sound than in pitch. Therefore, early pioneers such as Stockhausen, Brown, Konstanski, and others turned to graphic resources in order to more accurately depict their music in written form. Although there are a number of standard notational methods for electronic music, the scope of this paper must limit description to that of *Alias 610*. The score will be discussed according to its use of traditional notation versus its use of graphics as a cueing tool and its appropriation of graphics according to the sonic properties of each voice.

Use of Traditional Notation

Even though many contemporary compositions shun traditional notation in favor of a type of directed improvisation, the need for traditional notation in *Alias 610* was obvious. This was due to the fact that the violin and tape part work in an extremely contrapuntal relationship. The ESQ bell part, a pitched voice, is notated traditionally, providing a point of reference for the violin player. Even though the ESQ goes through far-reaching macro-dynamic changes, the basic sound is always pitched. The performer is better served through traditional notation of this voice than by a graphic representation. The violin part is also traditionally notated in explicit detail, providing no room for ornamentation, or, due to the nature of tape music, rubato.

The remaining two voices, the D-550 and the JX8P, emote neither pitched or standard rhythmic characteristics and therefore cannot be suitably represented with traditional notation. This being the case, the interests of the performer were better served through graphic means. These graphics were mainly used to provide additional cues and were therefore treated differently according to the status of the violin part.

Those sections which employ the violin, A, B, B', and A', also exhibit far greater detail concerning graphic notation. This is done to provide the violinist with as many cues as possible, for easier performance. Those sections which are void of the violin, the transitional sections, display far less detailed graphics, only alluding to a few important events to keep the performer informed and prepared for an upcoming entrance. For example,

the procession of events in the transition to B section are easily followed through the bell part, which is of course traditionally notated; however, additional cues are added through the graphic representation of the D-550 voice sporadically throughout the section. Similar treatment is given to the transition to B', where the D-550 and the JX8P are notated graphically. The traditionally notated bell part, however, is at times barely audible and, therefore, the performer must rely more heavily on the graphics to provide the necessary cues. In any case it is important that the graphics be dependable in their representation of musical events and must therefore be accurate in their visual depiction of the basic aural properties in each voice.

Appropriation of Graphics According to Sonic Properties

Obviously, the development of graphics as well as the language to represent a specific set of sounds can either be approached scientifically, displaying and describing all of the dynamic and spectral relationships in a precise manner, or creatively, displaying a subjective drawing and using descriptive language to display the sound's most prominent features. *Alias 610* uses the latter technique. For example, the D-550 voice displays six distinct characteristics throughout the course of the composition, each with its own graphic representation. Three of the six characteristics are introduced in the opening six measures, with the looping noise band that opens the piece, the white noise that it is layered with, and the percussive looped noise introduced in measure 6. The remaining three characteristics are introduced in the B and the transition to B' sections, with the fairly repetitive rhythmic

pattern in measures 82 - 107, the sustaining noise sound in measures 128 - 149, and the delay drenched quality of measures 144 - 209 (fig. 6).

1. Looped Noise Band

2. White Noise

3. Percussive Looped Noise Band

4. Repetitive Pattern

Fig. 6. Appropriation of Graphics for the D-550.

5. Sustaining Noise

6. Percussive Noise Band With Heavy Delay (200 ms right channel, 400 ms left channel stereo delay)

Fig. 6 Cont.

The JX8P voice is represented graphically in three different timbral states. The first, being the human vowel quality found in the A, B, A', and the transition to B' sections, is accompanied by the vowel sound that is most closely resembled at any keyboard controlling frequency, and this relationship provides some excellent cues to the performer. This voice takes on a completely new timbre in measures 63 - 69 due to a type of MIDI phase treatment and thereby requires a new graphic. Similarly, the extent of macrodynamic change found in the B section, which creates a high frequency timbre with a lengthy release, makes a new graphic necessary (fig. 7).

1. Filter Setting Produces Human Vowel Sound

(OH)

2. MIDI Phase

3. High Cut Off Frequency, Lengthy Attack and Release

Fig. 7. Appropriations of Graphics for the JX-8P.

With these being the only graphics in the entire composition, the performer can quickly become quite familiar with the associated sounds. Surely these nine distinct graphics along with the traditional notation of the bell part provide the performer with ample cues for a successful performance, and the investigative analyst with a greater understanding of the fabric that makes up *Alias 610*.

SUMMARY

In summary, *Alias 610* is a composition with an organizational structure firmly rooted in mathematical proportions. These proportions are arranged to create symmetrical subdivisions which highlight and are highlighted by important musical events, such as the change from a cellular to a serialized organization, large dynamic or textural changes, and the general sectionality of the piece. Furthermore, this composition focuses on micro and macrodynamic changes in timbre and utilizes three distinct methods of controlling these changes. Each method of control exhibits strengths and weaknesses which are strongly related to the character of the affected voice as well as the nature of change. Lastly, the pre-recorded music is represented by graphic notation which was constructed to better aid the performer's understanding of the tape part, and thus not every sonic event was transcribed. Those sections which entailed strict counterpoint were more thoroughly notated, those sections without violin were less detailed in their depiction. It is all of these tangibles -- the proportional tools, technological experiments, and visual depictions -- that fill up the organizational box that holds the composition for solo violin and tape, *Alias 610*.

NOTES

¹Erno Lendvai, Bela Bartok: An Analysis of His Music (London: Kahn and Averill, 1971).

²Marie-Louise von Franz, Numbers and Time (London: Aldus Books, 1975).

³Wayne Slawson, Sound Color (Berkeley: University of California Press, 1985): 184.

⁴Steve De Furia and Joe Scacciaferro, The MIDI System Exclusive Book (New Jersey: Third Earth Publishing, 1987): 190-193.

⁵This particular system exclusive data string did not contain a check sum.

SELECTED BIBLIOGRAPHY

- Antokoletz, Elliot. "Principles of Pitch Organization in Bartok's Fourth String Quartet." In Theory Only 3/6 (1981): 3-22.
- _____. "The Music of Bartok: Some Theoretical Approaches in the USA." Studia Musicologica 24 (1982): 67-74.
- _____. The Music of Bela Bartok: A Study of Tonality and Progression in Twentieth Century Music. Berkeley: University of California Press, 1984.
- Bachmann, Tibor and Bachmann, Peter. "An Analysis of Bela Bartok's Music Through Fibonacci Numbers and the Golden Mean." MusicalQuarterly 65/1 (1979): 72-84.
- Benjafield, John. "The Golden Rectangle : Some New Data." American Journal of Psychology 89/4 (1976): 737-43.
- Bernard, J.W. "Space and Symmetry in Bartok." Journal of Music Theory 30/2 (1986): 185f .
- Coleman, Samuel. Nature's Harmonic Unity: A Treatise on Relation to Proportional Form, ed. C.A. Coan. New York: G.P. Putnam's Sons, 1912.
- Coleman, Samuel. Proportional Form: Further Studies in the Science of Beauty, ed. C.A. Coan. New York: G.P. Putnam's Sons, 1920.
- Cook, Theodore A. Spirals in Nature and Art. London: Pigslop Press, 1903.
- Cook, Theodore A. The Curves of Life. London: Pigslop Press, 1914.
- De Furia, Steve, and Scacciaferro, Joe. The MIDI System Exclusive Book. New Jersey: Third Earth Publishing, 1987: 190-193.
- Fennelly, Brian. "Review of Lendvai." Journal of Music Theory 17/2 (1973): 330-334.
- von Franz, Marie-Louise. Numbers and Time. London: Aldus Books, 1975.
- Howat, Roy. "Principles of Proportional Analysis." Music Analysis 2/1 (1983): 69-95.

- Larson, Paul. "The Golden Section in the Earliest Notated Western Music." Fibonacci Quarterly 16/6 (1978): 513-515.
- Lendvai, Erno. "Duality and Synthesis in the Music of Bela Bartok." New Hungarian Quarterly 3/7 (1962): 91-114.
- _____. Bela Bartok: An Analysis of His Music. London: Kahn and Averill, 1971.
- _____. "Remarks on Roy Howat's Principles of Proportional Analysis." Music Analysis 3/3 (1984): 255-264.
- _____. "The Limits of Musical Analysis: Remarks of Roy Howats: Bartok, Lendvai, and Principles of Proportional Analysis." New Hungarian Quarterly 26 (winter, 1985).
- Lowman, Edward. "An Example of Fibonacci Numbers Used to Generate Rhythmic Values in Modern Music." Fibonacci Quarterly 9/4 (1971): 423.
- Kepes, Gyorgy. Module, Proportion, Symmetry, Rhythm. New York: George Braziller, 1966.
- Kramer, Jonathon. "The Fibonacci Series in Twentieth Century Music." Journal of Music Theory 17/1 (1973): 110-148.
- McMans, I.C. "The Aesthetics of Simple Figures." British Journal of Psychology 71/4 (1980): 505-524.
- Norden, Hugo. "Proportions and the Composer." Fibonacci Quarterly 10/3 (1972): 319-323.
- Perle, George. "Symmetrical Formations in the String Quartets of Bela Bartok." The Music Review 16 (1955): 300-312.
- Powell, Newman W. "Fibonacci and the Golden Mean: Rabbits, Rumbas, and Rondeaux." Journal of Music Theory 23/2 (1979): 227-273.
- Slawson, Wayne. Sound Color. Berkeley: University of California Press, 1985: 184.

Alias

♩ = 60

Violin

Bells

Tape

Noise Bands

legato

ppp (oh)

mp

p

Vln.

Tape

(oh) (oh) (oh)

p

gliss

Vln.

Tape

> mp < mf

pp

(oh) etc...

mf

5 3

Alias 610

JIM STEWART (1991)
for solo violin and
tape

legato

5

p *mp* *pp*

8

con brio

10

p *mf* *p*

(oh) (oh) (oh)

5

gliss

cantabile

15

mf *f* *decresc*

5-13

3

Vln.

Tape

(aw) (aw) (oh)

pp

p

5

3 (aw)

25

Vln.

Tape

p

pp

pp

p

4/4 (oh)

mf cresc. f decresc.

30

Vln.

Tape

(aw) (aw) (ee) (ee) (ee) (aw) (aw)

sf

mp

20

Musical score for measures 20-24. The score is written on three staves. The top staff has a treble clef and a key signature of one flat. The middle staff has a bass clef. The bottom staff has a wavy line representing a vocal line. The vocal line includes the following lyrics: (aw) (aw) (aw) (oh) (aw) (aw) (aw) (aw). The dynamics are marked as *mp* and *pp*. The time signature is 3/4.

Musical score for measures 25-29. The score is written on three staves. The top staff has a treble clef and a key signature of one flat. The middle staff has a bass clef. The bottom staff has a wavy line representing a vocal line. The vocal line includes the following lyrics: (oh) (ee) (ee) (ee) (aw) (aw). The dynamics are marked as *p* and *mf*. The time signature is 3/4.

35

Musical score for measures 30-34. The score is written on three staves. The top staff has a treble clef and a key signature of one flat. The middle staff has a bass clef. The bottom staff has a wavy line representing a vocal line. The vocal line includes the following lyrics: (oh) (ee) (ee) (ee) (aw) (aw). The dynamics are marked as *p* and *mf*. The time signature is 5/4.

♩ = 75 violin tacet to m. 70

40

Vln.

Tape

p

mp

$\frac{4}{4}$

50

Vln.

Tape

p

Vln.

Tape

f

mf

45

45

46

47

48

49

mp

55

55

56

57

58

59

mf

mp

60

60

61

62

63

64

mp

65 =78

Vln.

Tape

p

Vln.

Tape

70 =110 pui mosso

p *mf* *pp* *mf* *pp*

Vln.

Tape

75

mf *f*

First system of a musical score. It consists of three staves. The top two staves are mostly empty, with a few notes in the second staff. The third staff contains a complex, dense musical passage with many notes and accidentals, including a trill-like figure. A bracket with the number '7' is placed under a section of this passage.

Second system of a musical score. It consists of three staves. The top staff has a melodic line with a slur and a fermata. The middle staff has a complex, dense musical passage with many notes and accidentals, including a trill-like figure. The bottom staff has a complex, dense musical passage with many notes and accidentals, including a trill-like figure. Dynamics include *pp*, *f*, and *p*. The tempo marking *meno mosso* is present.

Third system of a musical score. It consists of three staves. The top staff has a melodic line with a slur and a fermata. The middle staff has a complex, dense musical passage with many notes and accidentals, including a trill-like figure. The bottom staff has a complex, dense musical passage with many notes and accidentals, including a trill-like figure. Dynamics include *p* and *mp*. A bracket with the number '3' is placed under a section of the middle staff.

80 *agitato*

Vln. *f*

Tape *p* *cresc* *ff* *mp* *decresc*

85 *sul ponticello*

Vln. *pp* *pp*

Tape *pp* *mf*

90

Vln. *mf* *p*

Tape

First system of a musical score. The top staff features a melodic line with triplets and slurs. The middle staff contains a complex chordal texture with many beamed notes. The bottom staff has a rhythmic pattern of eighth notes. Dynamics include *mf*, *mp*, *p*, and *mp*. There are crescendo and decrescendo hairpins.

Second system of the musical score. The top staff includes markings for *pizz.* (pizzicato) and *arco* (arco). The middle staff continues the complex chordal texture. The bottom staff has a rhythmic pattern of eighth notes. Dynamics include *mf*, *p*, *mp*, *f*, *pp*, and *p*. There are crescendo and decrescendo hairpins.

Third system of the musical score. The top staff includes the marking *leggero*. The middle staff continues the complex chordal texture. The bottom staff has a rhythmic pattern of eighth notes. Dynamics include *mf* and *f*. There are crescendo and decrescendo hairpins.

95

Vln.

Tape

$\text{♩} = 240$ saltando

f

100

Vln.

pizzicato

mf

Tape

The image shows a musical score for two parts: Violin (Vln.) and Tape. The Violin part is written on a single staff with a treble clef. It begins with a measure containing a quarter note G4 and a quarter rest. The second measure is marked 'pizzicato' and 'mf', containing a quarter note G4 with a staccato mark and a quarter rest. The Tape part is written on a single staff with a treble clef. It begins with a measure containing a quarter note G4 and a quarter rest. The second measure contains a quarter note G4 and a quarter rest. The third measure contains a quarter note G4 and a quarter rest. The fourth measure contains a quarter note G4 and a quarter rest. The fifth measure contains a quarter note G4 and a quarter rest. The sixth measure contains a quarter note G4 and a quarter rest. The seventh measure contains a quarter note G4 and a quarter rest. The eighth measure contains a quarter note G4 and a quarter rest. The ninth measure contains a quarter note G4 and a quarter rest. The tenth measure contains a quarter note G4 and a quarter rest.

105

Vln.

Tape

This musical score segment contains three measures of music. The top staff, labeled 'Vln.', is in treble clef and contains a complex melodic line with many beamed sixteenth and thirty-second notes, and some rests. The bottom staff, labeled 'Tape', is in treble clef and contains a series of upward-pointing arrowheads, some of which are beamed together, suggesting a rhythmic or electronic pattern. The measures are separated by vertical bar lines.

First system of a musical score. The upper staff contains a melodic line with three triplet markings (indicated by a '3' and a bracket) over eighth notes. The lower staff contains a bass line with eighth notes and rests.

Second system of a musical score. The upper staff is marked 'arco' and 'f' (forte). It contains a melodic line with eighth notes and triplet markings. The lower staff features a long, horizontal, wavy line, likely representing a sustained sound or a specific performance technique, with some notes appearing towards the end of the system.

Third system of a musical score. The upper staff is marked 'p' (piano). It contains a melodic line with eighth notes. The lower staff features a long, horizontal, wavy line, similar to the one in the second system, with some notes appearing towards the end of the system.

110

Vln.

Tape

pp

115

Vln.

Tape

p *mp* *mf* *mp*

120

Vln.

Tape

mp *p* *pp*

mp *mf*

stop tape

pp *f* *mf*

ppp

125 $\text{♩} = 224$

Vln. *pizz.* *pp*

Tape *start tape*

$\frac{3}{4}$

$\frac{8b}{4}$ *mp*

135

Vln.

Tape

140

Vln.

Tape

130

135

145

Vln.

Tape

ppp

155

Vln.

Tape

160

Vln.

Tape

150

Musical score for measures 150-153. The score is written on four staves. The first staff contains a melodic line with a crescendo hairpin and the dynamic marking *mf*. The second and third staves are mostly empty, with some notes in measure 153. The fourth staff contains a dense, textured accompaniment. The measures are divided by vertical bar lines.

Musical score for measures 154-157. The score is written on four staves. The first staff contains a melodic line with many slurs. The second and third staves contain a dense, textured accompaniment. The fourth staff contains a melodic line with many slurs. The measures are divided by vertical bar lines.

165

Musical score for measures 165-168. The score is written on four staves. The first staff contains a melodic line with many slurs. The second and third staves contain a dense, textured accompaniment. The fourth staff contains a melodic line with many slurs. The measures are divided by vertical bar lines. The dynamic marking *mf* is present in measure 166.

170

Vln.

Tape

mp

ppp

3

175

Vln.

Tape

Vln.

Tape

mf

pp

3

170

Four staves of music. The top two staves are empty. The bottom two staves contain musical notation. Measure 170: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter). Measure 171: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: D5 (quarter), E5 (quarter), F#5 (quarter), G5 (quarter). Measure 172: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: A5 (quarter), B5 (quarter), C6 (quarter), D6 (quarter). Measure 173: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: E6 (quarter), F#6 (quarter), G6 (quarter), A6 (quarter). The bottom two staves of measures 172 and 173 are filled with a dense, noisy texture of small notes and rests.

180

Four staves of music. The top two staves are empty. The bottom two staves contain musical notation. Measure 180: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter). Measure 181: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: D5 (quarter), E5 (quarter), F#5 (quarter), G5 (quarter). Measure 182: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: A5 (quarter), B5 (quarter), C6 (quarter), D6 (quarter). Measure 183: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: E6 (quarter), F#6 (quarter), G6 (quarter), A6 (quarter). The bottom two staves of measures 180 and 181 are filled with a dense, noisy texture of small notes and rests. The bottom two staves of measures 182 and 183 are empty.

185

Four staves of music. The top two staves are empty. The bottom two staves contain musical notation. Measure 185: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter). Measure 186: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: D5 (quarter), E5 (quarter), F#5 (quarter), G5 (quarter). Measure 187: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: A5 (quarter), B5 (quarter), C6 (quarter), D6 (quarter). Measure 188: Treble clef, key signature of one sharp (F#), 4/4 time. Notes: E6 (quarter), F#6 (quarter), G6 (quarter), A6 (quarter). The bottom two staves of measures 185 and 186 are filled with a dense, noisy texture of small notes and rests. The bottom two staves of measures 187 and 188 are empty.

190

Vln.

Tape

195

Vln.

Tape

205

Vln.

Tape

System 195-200. The system contains five staves. The top staff has a treble clef and a key signature of one sharp (F#). The music features a melodic line with a triplet of eighth notes marked with a '3' and a bracket. The bottom staff is heavily obscured by a dense, dark, speckled pattern, likely representing a corrupted or heavily processed audio track.

200

System 200-205. The system contains five staves. The top staff has a treble clef and a key signature of one sharp (F#). The music features a melodic line with a triplet of eighth notes marked with a '3' and a bracket. The bottom staff is heavily obscured by a dense, dark, speckled pattern, likely representing a corrupted or heavily processed audio track.

205

System 205-210. The system contains five staves. The top staff has a treble clef and a key signature of one sharp (F#). The music features a melodic line with a triplet of eighth notes marked with a '3' and a bracket. The bottom staff is heavily obscured by a dense, dark, speckled pattern, likely representing a corrupted or heavily processed audio track.

210

agitato =96 a la cadenza

mp

stop tape

pp

215

f

mp

fp

220

mf

First system of musical notation. The top staff contains a melodic line with a five-measure phrase marked with a bracket and the number 5, followed by a six-measure phrase marked with a bracket and the number 6, and then a three-measure phrase marked with a bracket and the number 3. The dynamic *mf* is indicated below the first phrase. The bottom staff is empty. The system is divided into three measures.

Second system of musical notation. The top staff continues the melodic line with a three-measure phrase marked with a bracket and the number 3. The dynamic *mf* is indicated below the first phrase. The bottom staff is empty. The system is divided into three measures.

Third system of musical notation. The top staff continues the melodic line with a three-measure phrase marked with a bracket and the number 3, followed by a five-measure phrase marked with a bracket and the number 5, and then a three-measure phrase marked with a bracket and the number 3. The dynamic *p* is indicated below the first phrase. The bottom staff is empty. The system is divided into three measures.

Vln. 225

mp *p* *f*

Tape

Vln. 230 *stacatto volante*

ff *mp* *f*

Tape

Vln. 235

f

Tape *mp*

start tape on beat four

First system of a musical score. The top staff contains a complex melodic line with many beamed sixteenth and thirty-second notes, including triplets and sextuplets. The bottom staff is empty.

Second system of a musical score. The top staff begins with a tempo marking of $\text{♩} = 120$ and the instruction *con gusto*. It features a few notes followed by rests, with a forte (*f*) dynamic marking. The bottom staff is empty.

Third system of a musical score. The top staff contains a melodic line with a crescendo leading to a fortissimo (*ff*) dynamic, followed by a decrescendo to a mezzo-forte (*mf*) dynamic. The bottom staff features a series of sustained notes with vocalizations: (aw), (aw), (aw), (aw), (aw), and (ee).

240

Vln. *mp* *f* *mf*

Tape (oh) (oh) (oh) etc... 3

245

Vln. *mp* *mf*

Tape 3

250

Vln. *ff* *mf*

Tape

First system of a musical score. It consists of three staves. The top staff has a treble clef and a key signature of one flat (B-flat). It begins with a *mf* dynamic marking. The middle staff has a treble clef and a key signature of one flat. The bottom staff has a bass clef and a key signature of one flat. The system is divided into three measures. The first measure contains a half note and a quarter note. The second measure contains a half note and a quarter note. The third measure contains a half note and a quarter note. There are triplets of eighth notes in the second and third measures of the top and middle staves. The bottom staff has wavy lines indicating a sustained or tremolo effect.

Second system of a musical score. It consists of three staves. The top staff has a treble clef and a key signature of one flat. It begins with a *f* dynamic marking. The middle staff has a treble clef and a key signature of one flat. The bottom staff has a bass clef and a key signature of one flat. The system is divided into three measures. The first measure contains a half note and a quarter note. The second measure contains a half note and a quarter note. The third measure contains a half note and a quarter note. There are triplets of eighth notes in the second and third measures of the top and middle staves. The bottom staff has wavy lines indicating a sustained or tremolo effect.

Third system of a musical score. It consists of three staves. The top staff has a treble clef and a key signature of one flat. It begins with a *mp* dynamic marking. The middle staff has a treble clef and a key signature of one flat. The bottom staff has a bass clef and a key signature of one flat. The system is divided into three measures. The first measure contains a half note and a quarter note. The second measure contains a half note and a quarter note. The third measure contains a half note and a quarter note. There are triplets of eighth notes in the second and third measures of the top and middle staves. The bottom staff has wavy lines indicating a sustained or tremolo effect.

255

Vln.

Tape

pp

ppp bell now has reversed attack

3

260

Vln.

Tape

Vln.

Tape

mp

First system of a musical score. It consists of two staves. The upper staff has a treble clef and contains a triplet of eighth notes in the first measure, followed by a whole note in the second measure, and a half note in the third measure. The lower staff has a bass clef and contains a whole note in the first measure, followed by a half note in the second measure, and a whole note in the third measure. A fermata is placed over the whole note in the third measure of the lower staff.

265

Second system of a musical score. It consists of two staves. The upper staff has a treble clef and contains a whole note in the first measure, followed by a half note in the second measure, and a whole note in the third measure. The lower staff has a bass clef and contains a whole note in the first measure, followed by a half note in the second measure, and a whole note in the third measure. A fermata is placed over the whole note in the third measure of the lower staff. The dynamic marking *mp* is written below the lower staff.

270

Third system of a musical score. It consists of two staves. The upper staff has a treble clef and contains a whole note in the first measure, followed by a half note in the second measure, and a whole note in the third measure. The lower staff has a bass clef and contains a whole note in the first measure, followed by a half note in the second measure, and a whole note in the third measure. A fermata is placed over the whole note in the third measure of the lower staff. The dynamic marking *pp* is written below the lower staff.

2

Vln.

Tape

6/4

6/4

275

The image shows a musical score for three staves. The first two staves are in 6/4 time and contain a whole note chord. The third staff contains a wavy line and the word 'niente'.