UNIVERSITY OF CINCINNATI

Date: 7/23/09

I, Brett Clement,

hereby submit this original work as part of the requirements for the degree of:

Doctor of Philosophy

in Music Theory

It is entitled:

A Study of the Instrumental Music of Frank Zappa

Student Signature: Brett Clement

This work and its defense approved by:

Committee Chair: David Carson Berry

Steven J. Cahn

Catherine Losada

Approval of the electronic document:

I have reviewed the Thesis/Dissertation in its final electronic format and certify that it is an accurate copy of the document reviewed and approved by the committee.

Committee Chair signature: David Carson Berry

A Study of the Instrumental Music of Frank Zappa

A dissertation submitted to the

Graduate School

of the University of Cincinnati

in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

in the Division of Composition, Musicology, and Theory

of the College-Conservatory of Music

by

Brett Clement

B.M. Florida State University (2002)

M.M. Florida State University (2004)

July 2009

Committee Chair: Dr. David Carson Berry

ABSTRACT

This dissertation offers the first large-scale analytical study of the instrumental music of Frank Zappa (1940–1993). Following initial commentary in Chapter 1 on the problems of categorization in the repertoire, Chapter 2 offers a preliminary discussion of *style* and *form* in Zappa's music. Regarding style, I detail the fallouts of Zappa's unique early musical education as well as the influence of his guitar playing in his compositional style. My investigation of form explores the formal implications of melodic repetition, examining non-repeating forms characteristic of the *hybrid* music and repeating forms utilizing variation procedures such as *contour retention* and *isomelism*.

Chapter 3 is devoted to rhythm and meter in Zappa's music. The primary topics of this chapter are various types of rhythmic/metrical conflict, including polymeter, *metrical dissonance*, and *rhythmic dissonance*, which are explained in part as an attempted merging of advanced compositional techniques and rock/pop music norms. A theoretical discussion of rhythmic dissonance, which is Zappa's trademark rhythmic device, comprises the bulk of the chapter.

Chapter 4 offers a *Lydian theory* for Zappa's diatonic music, loosely adapted from George Russell's seminal jazz theory *The Lydian Chromatic Concept* (1953). This theory views the Lydian scale as representing a tonic state in Zappa's music due to its special static attributes. It introduces the concept of a *Lydian system*, containing a limited group of diatonic modes related to a common Lydian scale. Within, I demonstrate how the pitch structures of non-Lydian modes are related abstractly to those of the Lydian tonic, and follow by considering *pedal substitutions* and *progressions* within the Lydian system.

Chapter 5 is devoted to Zappa's non-diatonic music. The first section of this chapter explores Zappa's methods of *chromatic* pitch organization, including *pitch-class diversity*, *chromatic saturation*, and *symmetry*. The second section investigates a system of composition based on a *Chord Bible* of Zappa's own devising. This section includes a preliminary recreation of certain aspects of Chord Bible and a discussion of the compositional employment of Chord-Bible harmony in the series of orchestral works composed circa 1977–1982.

ACKNOWLEDGMENTS

First, I would like to thank those directly involved with this project. I am greatly appreciative of my advisor David Carson Berry for his assistance and support throughout the research and writing of the dissertation. Additionally, I would like to thank committee members Steven J. Cahn and Catherine Losada for offering many insightful comments on several drafts of the document. I would also like to thank Matthew Shaftel for his early encouragement of my research into Zappa's music at Florida State University.

I would like to extend my appreciation to those who have made research materials available to me. Special thanks are given to Jonathan W. Bernard, Arved Ashby, and librarian Nicholas Wilkenson for allowing access to several scores. I would also like to recognize David Ocker for offering his recollections at several points during my studies. Additionally, I must acknowledge the support of Gail Zappa and the Zappa Family Trust. Finally, I would like to thank numerous members of the Zappa fanbase for their prior work of cataloguing Zappa's interviews, concerts, and other materials and for making them readily available.

Most importantly, I must thank my family for their generous support throughout the dissertation process.

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CHAPTER I

INTRODUCTION

I. Topic and repertory.

This dissertation offers the first large-scale analytical study of the instrumental music of Frank Zappa (1940–1993). My intention is to identify and explicate the principal compositional techniques found in this music and to explore certain relevant theoretical concepts. I do not claim that this study represents a comprehensive examination of all facets of Zappa's very diverse output; such an inquiry would involve a repertoire significantly larger than the music I will discuss. Nevertheless, my use of the term "instrumental" is somewhat loose, as I do intend to consider certain musical passages that have been set to text. Specifically, the titles to be investigated will include the following: (1) those that exist only in instrumental form; (2) those that have appeared both as songs (i.e., with lyrics) and as instrumentals (a common phenomenon in Zappa's music); (3) short connective instrumental passages or interludes that appear within songs; and (4) songs that share characteristics with the instrumentals and were most likely first composed without a text. Well over 150 compositions by Zappa are described by one of these four categories (the majority by one of the first three).[1] While this body of work naturally represents a more manageable size for analytic inquiry than the entire Zappa output, it is still far

[1] Determining the exact number of instrumental works composed by Zappa is challenging for many reasons. In fact, "piece" and "work" are somewhat misleading terms when applied to much of Zappa's instrumental music, as only a certain segment of his instrumental titles appear as "closed" works, fixed in form and instrumentation. More often, given the open-ended nature of Zappa's musical forms (to be discussed in Chapter 2), an instrumental passage allows for any number of contextual employments. Therefore, it is often difficult to determine what does or does not constitute a "piece of music" in Zappa's output. Indeed, many instrumental passages appeared under different titles throughout Zappa's career. For the purposes of this study, I will reserve the terms "piece" and "work" for those titles achieving a sufficient degree of contextual closure.

too large for practical purposes. Therefore, I will be concerned with a smaller, but substantial, selection of titles that I believe are representative of the variety of styles in which he composed.

In order to determine this selection, I have attempted to draw upon the broadest variety of music possible, but practical considerations have precluded the incorporation of many compositions into this study. The most serious setback for the analyst of Zappa's music is the difficulty in obtaining musical scores, which have not been available for commercial purchase since the beginning of 2005.[2] While roughly fifteen of the aforementioned scores will be utilized in this study, the vast majority of my analyses will be based on my own transcriptions.[3] Because these transcriptions are not based on scores that the reader can easily obtain and consult, the musical examples based on these transcriptions herein will most often not indicate measure numbers, opting instead for time indications from recordings. (For those titles available in score, I will provide both measure numbers and time indications.) Unfortunately, there are many pieces by Zappa that, due to their complexity, are not practical candidates for transcription. As a result, Zappa's later works, including pieces premiered on *The Yellow Shark* (1993) and his final album *Civilization Phase III* (1994), are not as well represented as might be ideal. My study, therefore, will focus primarily on Zappa's instrumental output from the middle 1960s to the middle 1980s, with several sojourns into earlier and later periods. This body of work, though extremely varied in style, instrumentation, and musical language, constitutes a significant repertoire of twentieth-century instrumental music, one which has yet to be treated to an extensive analytical study.

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[2] The Zappa Family Trust, who owns the rights to Zappa's music, still rents out scores for performance. Otherwise, procuring scores has proven difficult. Two of Zappa's albums (*Hot Rats* and *Apostrophe*) are currently available in the form of "guitar books" from Hal Leonard Publishing.

[3] My transcriptions will most often take the form of sketches or reductions. Because different recordings and versions of certain instrumentals exist throughout Zappa's career, my musical examples will indicate, via album title and time indication, the particular performance of the piece that the given transcription best represents. If the transcription contained in given musical example is representative of several different available recordings, the album title indication will serve merely as a reference.

II. Organization.

Finding a method of organization with which to discuss a repertoire as large and varied as Zappa's instrumental music is challenging for a number of reasons. Many seemingly logical ways to categorize his music can be problematic, especially for a study in which the focus is analytical. In the following discussion, I will demonstrate some of the inherent difficulties in classifying Zappa's instrumental works and provide an overview of the types of pieces one finds in this repertoire. In doing so, I will consider three potential methods of organization—instrumentation, style, and chronology—before turning to explicate my intended method.

Instrumentation provides the easiest avenue for organizing a study of Zappa's instrumental compositions. Jonathan W. Bernard, for example, has considered the interrelationships between Zappa's pieces composed for "acoustic concert ensembles" (ACE), such as concert orchestras or chamber ensembles, and works that were performed by his various touring bands.[4] Following Bernard's nomenclature, I will adopt the term ACE and, in a similar manner, will designate Zappa's more typical electric instrumentation as "electric concert ensembles" (ECE).[5] In addition to the two classifications just noted, a large number of titles from the early 1980s onward were composed for (and on) the Synclavier (hereafter SYN), a synthesizer/sampler. While these three categories (ACE, ECE, SYN) are convenient descriptive tools, they unfortunately provide little substantial information about the compositions that they describe. One reason they prove inadequate is due to the large number of "crossover" pieces that exist within Zappa's instrumental output: that is, pieces or passages that were rearranged from

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[4] Jonathan W. Bernard, "Listening to Zappa," *Contemporary Music Review* 18/4 (2000): 63–103.

[5] While Zappa's ECE works often incorporate acoustic instruments, they are primarily characterized by the employment of electric instruments such as electric guitar, electric bass, and electric keyboards.

one instrumentation type to another.[6] In most cases, as Bernard has detailed, the crossover transpires between works that were originally performed by ECE and were later recomposed or re-orchestrated for ACE. Nevertheless, numerous examples of the reverse scenario exist; and SYN pieces likewise participated in the crossover process, particularly towards the end of Zappa's career.[7] Because the concept of crossover is an essential factor in Zappa's music, most of his instrumental titles have at least the *potential* to crossover to one of the different categories.[8] As Zappa stated, "Well, look at it this way. They're pieces: pieces of music that have harmony, melody, and rhythm and some sort of an idea that makes them go; and the rest is just a matter of orchestration."[9] Consequently, shared instrumentation between different titles provides no guarantee of consistency in compositional technique.[10]

A second potential method of organization is to treat Zappa's output according to general *musical styles*. As compositional techniques are my focus, style would seem to be a more reliable consideration, as it is often closely aligned with technique. However, this method fails due to the sheer difficulty of assigning stylistic labels to Zappa's music. That said, three (admittedly generic) stylistic categories are often cited in reference to Zappa's instrumental

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[6] Jonathan W. Bernard discusses a number of these "crossover" works in "The Musical World(s?) of Frank Zappa: Some Observations of His 'Crossover' Pieces." In *Expression in Pop-Rock Music*, ed. Walter Everett (New York: Garland, 2000): 157–209.

[7] Many examples of switching from ACE to ECE can be found in Zappa's albums with the first lineup of the Mothers of Invention. His orchestral scores for the movies *The World's Greatest Sinner* (1962) and *Run Home Slow* (1965) furnished a number of ECE pieces that were played in concert and on albums such as *Lumpy Gravy* (1968), *Uncle Meat* (1969), and *Burnt Weeny Sandwich* (1970).

[8] Even a large orchestral work such as *Mo 'N' Herb's Vacation*, which might seem to have little potential for an ECE performance, was performed as a regular feature of the Fall 1978 ECE band tour. The first movement of this work was played as a duo for electric bass and drums (sometimes adding vibraphone).

[9] David Mead, "Unholy Mother—Frank Zappa," *Guitarist Magazine*, June 1993.

[10] This is not to say that instrumentation is *never* a decisive factor in relation to compositional technique. For example, Chord-Bible harmony, to be discussed in later in this study, is found more commonly in ACE and SYN works.

music: (1) styles typically associated with twentieth-century classical music; (2) pop/rock styles; and (3) modern jazz styles. Arguably, certain pieces could fit, if uncomfortably, within one of these three categories. For example, "Peaches En Regalia" from *Hot Rats* (1969) represents fairly well an instrumental in the pop/rock style, while "Blessed Relief" from *The Grand Wazoo* (1972) and "Naval Aviation in Art?" from *Orchestral Favorites* (1979) are consistent with modern jazz and twentieth-century classical styles, respectively. Pieces such as these, however, are exceptions to the norm, as the majority of Zappa's instrumental titles do not belong properly to any of these three categories. In some cases, the challenge of categorization is the result of stylistic fusion, whereby two or more of the above-cited styles interact in the same work. Compositions such as "Be-Bop Tango" (1973) and "The Black Page #2" (1976) exploit such potential for stylistic interaction. In "The Black Page #2," for example, a disco-style accompaniment is paired with a melody that features advanced rhythmic techniques. More commonly, the stylistic synthesis in Zappa's music is achieved to an extent that stylistic labels become unusable. Where, for example, could one place the three-movement *Sinister Footwear* orchestral score, the last movement of which is based on an improvised guitar solo?

The preceding discussion is not intended to minimize the importance of instrumentation and style in Zappa's music. Contrary to his own words, they were quite often central concerns for Zappa, who was well aware of listeners' deeply-ingrained expectations regarding these issues. Much of the difficulty one encounters in trying to categorize his output in reference to style or instrumentation is a product of his exploitation (as in "The Black Page #2") or subversion (as in "Sinister Footwear III") of these traditional notions.[11] Attempting to apply these categories to Zappa's music, and ultimately failing to do so successfully, is a key

[11] See Arved Ashby, "Frank Zappa and the Anti-Fetishist Orchestra," *The Musical Quarterly* 83/4 (1999): 557–605.

component in the process of understanding his work. Nevertheless, as methods of organization for a comprehensive analytical study, categorizations by instrumentation and style fall short of ideal.

As opposed to the previously-discussed methods, a third consideration, *compositional chronology*, seems more promising, as it could allow us to track the development of Zappa's compositional techniques throughout his career. However, chronology will not determine the organization of my discussion, as the compositional chronology of Zappa's works has yet to be established. In fact, it is quite possible that attaining a definitive chronology may be unfeasible for many years. The official Zappa discography is often an unreliable indicator of chronology; therefore, one cannot necessarily assume that the composition of a given piece is concurrent with its first official release on an album.[12] On the other hand, the "performance chronology" of his works is much easier to track, given the large number of concert recordings and research undertaken by fans throughout the years.[13] As performance chronology is ultimately a more reliable indication of a work's chronology, I will consistently designate both the premier performance date (i.e., year) and premiere release date of a given piece, which will provide the reader with a general sense of when both the concert-going public and the record-buying public had an opportunity to first hear the music in question. For example, when referring to a title such as "Be-Bop Tango" (ECE/ACE 1972/1974b), the first date listed will indicate the year in which the piece was first performed, while the second date will provide the release date of the album on which the piece first appeared; if only one date is provided, these dates are the same, as for

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[12] With some exceptions, Zappa did not write his music with "albums" in mind, and the manner in which he presented his music from album to album often presents the listener with a clouded sense of chronology in the way that recordings from various bands, concerts, or periods are melded together.

[13] The websites of Román García Albertos http://globalia.net/donlope/fz. and Jon Naurin, http://www.zappateers.com/fzshows/index.html are particularly helpful resources for readers wishing to track the progress of a given piece throughout Zappa's career.

"Peaches en Regalia" (ECE 1969b). Figure 1.1 offers a chronological listing of the albums cited in this study, along with a release date that corresponds to my labeling system for titles.[14]

The organizational approach that I will adopt hereafter parses Zappa's output according to rhythmic and pitch attributes, which will aid our interest in compositional techniques and music-theoretical concepts. Our focus will narrow progressively with each chapter. Therefore, the discussion in Chapter 2, which provides an overview of certain considerations of *style* and *form* in Zappa's music, applies to the greatest number of titles. This chapter deals with several important preliminary issues, including the stylistic features arising from Zappa's unique musical education and his interest in the guitar as well as the formal implications of different approaches to melody in Zappa's music. Chapter 3 will be devoted to an investigation of *rhythm* and *meter*, focusing on methods of rhythmic/metrical conflict, particularly the concepts of metrical and rhythmic *dissonance*. Chapters 4 and 5 will be focused on Zappa's *diatonic* and *non-diatonic* pitch language, respectively. It is necessary to separate these two approaches to pitch organization because, given the inherent distinctions between the diatonic and chromatic/non-diatonic pitch universes, the pitch-related compositional techniques employed are necessarily of a different nature. Chapter 4 offers a "Lydian theory" for the diatonic music, loosely adapted from George Russell's seminal jazz theory "The Lydian Chromatic Concept" (1959). Chapter 5 is organized in two parts, the first dealing with *chromatic* music and the second on titles incorporating *non-diatonic scales*. The first of these investigates the musical fallouts of Zappa's early interest in serialism, while the latter section details a system of harmony Zappa utilized for his orchestral works circa 1977–84 based on a *Chord Bible* of his own devising.

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[14] This list only provides those albums to which I will refer in this study; therefore, it does not represent a complete discography. Also, certain albums, such as *Joe's Garage*, *Shut Up 'N Play Yer Guitar*, and *London Symphony Orchestra*, were originally released piecemeal. They are all now currently available as single items; hence, the date given is that which corresponds to the release of the first volume in the series.

CHAPTER II

STYLE AND FORM

Introduction.

The purpose of the present chapter is to foreground the techniques to be discussed in the core analytical chapters of this study (which follow). As few comprehensive analyses of individual pieces will be presented in these chapters, it will be beneficial first to consider broader issues of *style* and *form* in Zappa's music. The follow sections are not designed to treat these issues in a comprehensive manner, as such an endeavor would take us off course from our larger goal of understanding of certain segment of Zappa's instrumental output. Instead, I will focus on a selection of important topics particularly relevant to the repertoire under study. In part one, I will discuss the stylistic fallouts from two unique aspects of Zappa's musical development: (1) his formal musical education (or lack thereof); and (2) his guitar playing. In part two, I will be primarily concerned with general techniques applied to melody and the relationship of these procedures to form. Particularly, I will discuss the role of *melodic repetition* in Zappa's formal thinking. These topics will help establish the contextual framework necessary to better understand the compositional procedures and accompanying theoretical concepts to which the body of the study is devoted.

I. Stylistic preliminaries.

> The composition end of my musical experience started in high school, when I heard an album by Edgard Varèse, and I said, "boy, that sounds great, I'd like to write some of that." I also got hold of an album called *The Rite of Spring*. . . . And that excited me too; I thought, "boy, if anybody could make a missing link between Edgard Varèse and Igor Stravinsky, that would be pretty nifty." And then somebody turned me on to an album of music by Anton Webern and I said, "wow, if anybody could get a missing link between Igor Stravinsky, Anton Webern, and Edgard Varèse, that would be pretty spiffy." And then I started hearing some music of Tibet, music of India, music of the Middle East and I started *randomly synthesizing* all of the things that appealed to me. That's where the current musical language that I'm using now came from.[1]

In the quote offered above, Zappa describes his compositional style as a synthesis of four musical sources: the composers Varèse, Stravinsky, Webern, and the music of the Middle East. In Chapters 3–5, all of these sources will be shown to influence certain facets of Zappa's compositional technique. However, this description could easily lead one to view Zappa's music as being merely derivative. A better understanding of Zappa's instrumental style can be gained through a consideration of those aspects of his musical experience *unique* to him. These are the issues with which we will be concerned in the following section, as they are the most fundamental to his stylistic development.

A. Zappa's early musical education.

Jonathan W. Bernard has aptly characterized Zappa's musical education as "autodidacticism on the edge."[2] Accordingly, nearly everything Zappa learned of music in his youth, from performance to music theory to composer's repertoires, was a result of his own interests and/or practical experiences. Due to the circumstances of his education, the knowledge that he ultimately gained was naturally selective, resulting in certain practical "deficiencies."

[1] VPRO documentary, 1971.

[2] Jonathan W. Bernard, "Listening to Zappa," 68.

Indeed, as will be demonstrated, Zappa's embracement and exploitation of these deficiencies was decisive in the development of his compositional style.

Zappa's awakening as a composer occurred during his early high school years (or perhaps slightly earlier), after hearing an album entitled *The Complete Works of Edgard Varèse*. The first obstacle to Zappa's development as a composer was his lack of musical training, as his only prior musical interest had been percussion, which he played in his junior-high school's percussion ensemble. With few musical tools at his disposal, his early compositional experiments arose primarily from his interests in the visual arts. Particularly, the musical score—something most musicians take for granted—held endless fascination for Zappa:

> I'd never seen music on paper. . . . Then I saw a score. It just looked so wonderful—the very idea that this graphic representation, when translated into sound waves through the efforts of skilled craftsmen, would result in music. . . . So I got a ruler, I went out and bought some music paper, and I just started drawing.[3]

Evidently, the young Zappa equated the aesthetic value of music with its visual representation: "Theoretically a person who could read dots on paper [would then] translate your engraving into some kind of audio masterpiece."[4] With the aid of his high-school band teacher, Zappa eventually managed to hear some of the music he had been composing. He recalled, "I got the shock of my life when I realized that it didn't sound like what I wanted it to sound like. So at that point I had to find out how the system really worked."[5]

Though Zappa's youthful naivety might seem of little significance, it had important consequences for his music. Throughout his career, he maintained an interest in the visual

[3] Michael Bloom, "Interview with the Composer," *Trouser Press*, February 1980.

[4] Paul Zollo, "The SongTalk Interview," *SongTalk*, Volume 2, Issue 5, 1987. By his own words, he was allowed to proceed under this "delusion" for a long while: a testament to just how little feedback he was receiving from other musicians at this stage in his development.

[5] Ibid.

representation of music: a concern that played a large role in his predilection for musical complexity. The titles of some of Zappa's later compositions directly reference the musical score, as in the piece "Little Dots" (1972, unreleased) and "The Black Page" (ECE 1976/1978a). As musical evidence of this visual orientation, consider Example 2.1, from "Mo 'N' Herb's Vacation I" (ACE/ECE 1978/1983c). The concept of "drawing music" certainly applies to this melodic phrase, with its intricate wavelike patterns; also, note that adjacent rhythmic groupings are transposed retrogrades of one another.[6]

Zappa's fascination with the musical score also influenced the manner in which he composed. That is, his preferred method of composition became "on paper" (as opposed to composing with an instrument).[7] Even after Zappa had adopted the Synclavier as his primary compositional tool—thereby supplanting the "on paper" method—he recalled how much he "used to love to write music with paper and pencil. . . . I'd just write music all the time."[8] The pleasure he derived from the physical act of writing music was partly responsible for the impressive speed at which he was able to compose. More importantly, Zappa's compositional method had a decisive effect on the *sound* of his music. As Bernard notes, "the vast majority of Zappa's pieces have all the earmarks of creations whose primary form is *written*."[9] That is, the aural result of his music is often that which could only have been conceived on paper.

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[6] According to David Ocker, Zappa's copyist from the late 1970s to early 1980s, the second movement of *Mo 'N' Herb's Vacation* was originally written using vinyl press-one intended for graphic designers, the idea being for the orchestra to improvise melodies according to the patterns of the graphic symbols. Email correspondence with the author, April 16, 2008.

[7] Steve Vai, guitarist and transcriber for Zappa from 1979–82, remembers that Zappa would "sit with blank music paper and write music all the time. In 1981, on the American tour, every minute offstage that you saw Frank, he was writing music down on paper." Andy Aledort, "Zappa's Universe: An Interview with Steve Vai and Mike Keneally," *Guitar Player*, February 1999.

[8] Steve Birchall, "Modern Music Is a Sick Puppy," *Digital Audio*, October/November 1984.

[9] Jonathan W. Bernard, "Listening to Zappa," 77.

Zappa described his formal musical education as "practically nil."[10] Beyond crediting two of his high-school band instructors, Robert Kavelman and William Ballard, with encouraging his early compositional experiments, he claimed to have had his only exposure to formal training in music theory in his late teens.[11] During his senior year of high school, he was permitted to take a harmony course at Antelope Valley Junior College. The professor, Mr. Russell, taught out of Walter Piston's harmony book, which Zappa found "quite boring."[12] It would appear that this same text was used for his next (and final) harmony course, given during his one semester of college at Chaffee Junior College, when he was 19.[13] Zappa viewed much of his formal education as an affront to his creativity: "Every time one of the exercises was presented, you would hear how the chords were supposed to resolve. All I could hear was the infliction of normality on my imagination."[14] His resistance may have largely been due to his musical tastes. In 1963, he claimed, "I know absolutely nothing about any composers before the twentieth century. . . . My own personal tastes in music . . . do not include very much tonal music."[15]

Zappa's rejection of tonal theory naturally contributed to his harmonic vocabulary, which typically eschews functional tonal progressions.[16] More fundamentally, his lack of interest in

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[10] Post-concert question and answer session, Mount St. Mary's College, May 19, 1963.

[11] Frank Zappa and Peter Ochiogrosso, *The Real Frank Zappa Book*: 35.

[12] Paul Zollo, "The SongTalk Interview," *Songtalk*, Volume 2, Issue 5, 1987. See Walter Piston, *Harmony* (New York: Norton, 1944).

[13] This can be deduced from the fact that his instructor, Joyce Shannon, remembers Zappa having already read the text they were using. Barry Miles, *Zappa* (New York: Grove Press, 2004): 57.

[14] Don Menn, "The Mother of All Interviews," *Best of Guitar Player*, 1994.

[15] Mount St. Mary's College, May 19, 1963.

[16] This issue will be dealt with in detail in Chapter 4.

voice-leading and counterpoint rules impacted the types of textures found in his music.[17] Almost without exception, contrapuntal textures are lacking, a fact that can easily be verified by inspecting the examples used in this study. The very brief contrapuntal passage given in Example 2.2, from “Rollo” (ECE 1972/1988b), is the most extensive manifestation of a contrapuntal texture I have found in Zappa’s pre-1977 works.[18] As can be seen, the melodic idea presented in the first measure of the example is imitated at T5 in the next measure, followed by the beginning of a further T5 statement in the third measure. This quasi-fugal texture breaks down in the fifth measure of the example, as the separate voices lose their rhythmic independence and begin stating their pitches in homorhythm. In terms of contrapuntal textures in Zappa’s music, the final two measures of Example 2.2, wherein the voices have some independence relating to pitch but not rhythm, are typical.

Following Zappa’s brief formal musical education, his role as autodidact became even more pronounced. Even during his semester at Chaffee Junior College, he had taken it upon himself to listen to records and study scores at the college library: the activity he considered the most beneficial of his college education.[19] Thereafter, his own compositional experiments—along with a small number of musical influences—became his primary tool for learning about music.

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17 Zappa claimed to have purchased a counterpoint manual at some point (probably around this time) and to have rejected it after reading only a few pages. David Mead, “Unholy Mother—Frank Zappa,” *Guitarist Magazine*, June 1993.

18 In Chapter 5, I will discuss a method Zappa eventually developed that does create quasi-contrapuntal textures.

19 David Mead, 1993.

B. Guitaristic elements in Zappa's music.

A pivotal event in Zappa's musical development was his acquisition of a guitar when he was 18 years old. From this point forward, his guitar playing became a decisive factor in his compositional style. As he stated, "I think of myself as a composer who happens to have the guitar as his main instrument. . . . The stuff I write is determined by my interest in the guitar."[20] Though Zappa's guitar playing gave him an inroad into the world of rock music—thereby exposing his music to larger audiences and facilitating some of his success and notoriety—he was consistently intent on distinguishing himself from his guitarist peers. As will be shown, Zappa achieved this by consistently propelling his guitar playing into decidedly unfamiliar musical avenues.

As with his musical education, certain aspects of Zappa's compositional style can be seen as arising from "deficiencies" in his guitar training. His development on the guitar was initially handicapped by the type of guitar he was playing: an acoustic given to him by his brother Bobby. Zappa described it as having strings "so high (off the fretboard) that I couldn't play chords on it, so I started playing [melodic] lines right away."[21] According to Zappa, within four weeks of acquiring his guitar he was playing "shitty teenage leads."[22] This practical limitation was therefore a factor that impelled Zappa towards melodic improvisation, which would occupy much of his subsequent music. His preference for single-line melodies on the guitar also had a substantial effect on his own composed music, as melody-driven textures became in many ways his compositional trademark:

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20 Tim Schneckloth, "Garni Du Jour, Lizard King Poetry and Slime," *Downbeat Magazine*, September 1973.

21 Jerry Hopkins, "Interview with Frank Zappa," *Rolling Stone*, July 1968.

22 Ibid.

> I'm interested in melodies and it's the one thing I find lacking in most of the music today. The construction of melody is a specialized art form. I know a lot of people who can write and arrange but don't pay enough attention to where the melody is. It's a big challenge to write a melody.[23]

Zappa's preoccupation with melody represented a solution of sorts to his lack of training in other compositional textures. Once he acquired a guitar, he took it upon himself to specialize in the art of melodic composition. Therefore, as we will see throughout this study, the analysis of Zappa's instrumental music is largely an examination of melody and how melody relates to other musical parameters.

Zappa's guitar playing also supplied him with an additional method of composition (besides the "on-paper" method described above). Surprisingly, though, very few of Zappa's works—particularly those under investigation here—are idiomatic to the guitar; therefore, it can be assumed that most were not composed with the instrument.[24] As a means of comparison with later-discussed pieces, consider Example 2.3, a sequential passage from "Echidna's Arf (Of You)" (ECE 1973/1974b) that was most certainly conceived on the guitar. A full accounting of this excerpt depends on an understanding of the guitar mechanics involved. First, as the example shows, each measure can be played with the same left-hand pattern, which involves "barring" the two lowest notes with the first finger and playing the two highest notes with the third and fourth fingers.[25] Second, there is a strict pattern in the frets being barred for the first five measures of the example, alternating between the seventh and eighth frets on the guitar while simultaneously

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[23] Jim Schaffer, "The Perspective of Frank Zappa," *Downbeat Magazine*, September 1973.

[24] Comments from former band members suggest that Zappa would use the guitar to compose during rehearsals, but mostly "to show people what notes or chords to play on their instruments." Andy Aledort, "Zappa's Universe: An Interview with Steve Vai and Mike Keneally," *Guitar Player*, February 1999. Works that were most likely composed on the guitar include "Big Swifty" (ECE 1972b), "Zoot Allures" (ECE 1975/1976), "Sleep Dirt" (1971/1979a), "What's New in Baltimore?" (ECE 1981/1985), and "Echidna's Arf (Of You)" (ECE 1973/1974b).

[25] Barring involves placing the index finger of the left hand (or fretting hand) flat over one of the frets on the guitar.

moving downward one string with each measure (roman numerals indicate the position and underlined Arabic numbers the strings). Once all the strings on the guitar have been exhausted, the pattern is discontinued. Third, the aforementioned replicated left-hand fingering causes a natural discrepancy in the pitch sequence established at m. 1. Once the left hand reaches the second and third strings of the guitar at m. 4, the sequence is altered to start with a major third rather than a perfect fourth. This discrepancy occurs because the guitar is not tuned uniformly in perfect fourths: the second and third strings are tuned instead as a major third. Not only does this alter the melodic sequence, but it also determines the pitches played by the bass; when a measure begins with a perfect fourth in the melody, the bass interprets the higher note in the fourth as the "root" and accompanies accordingly; when a measure begins with a major third, the lower note in the third is treated as the root.

Stylistically, the most significant aspect of Zappa's treatment of the guitar was his attempt to integrate his guitar playing with his pre-composed melodies. At various times throughout his career, he claimed that his guitar improvisations were, in fact, worthy of the term "composition":

> When I'm playing a guitar solo, I'm doing exactly the same thing that I do as a composer. A solo is an *instant composition*.[26] To me, if every one of those things was written down as I played it I would be just as happy to sign my name to it as a musical composition that I would sit down and write on a table, because that's what I'm doing, I'm a composer, it's just that instead of a pencil I'm using a guitar.[27]

Though one could easily dismiss such statements, Zappa did indeed conceive of methods with which to present his solos as "true" compositions. Beginning with "Rat Tomago" (ECE 1978/1979b) on the album *Sheik Yerbouti* (1979), Zappa began presenting excerpted guitar solos

[26] Alan Perna, "Hey Frank, Where You Goin' With That Guitar in Your Hand?" *Musician*, September 1988.

[27] John Swenson, "Interview with Frank Zappa," *Guitar World*, March 1982.

(usually taken from live concerts) as independent compositions (i.e., each solo given a title distinct from that of its original context). He released a plethora of such solos on albums including the three-record set *Shut Up 'N Play Yer Guitar* (1981), *Guitar* (1988), and the posthumously released *Trance-Fusion* (2006). In addition to these recordings, he further encouraged listeners to view his solos as "compositions" by having them transcribed and published as scores. The fruits of this project were published as *The Frank Zappa Guitar Book* (1982), with transcriptions primarily done by guitarist Steve Vai.[28] To date, in fact, this book represents the most extensive collection of Zappa's music ever given wide publication.

Zappa also exploited the technology of the modern recording studio, in particular the ability to overdub, towards the ends of treating his solos as compositions. The album *Hot Rats* (1969) heralded the first significant examples this technique, which, with the help of post-performance overdubbing, involves doubling an improvised melodic line at the octave or unison, thereby creating the impression that the improvisation is a composed melody (i.e., composed and not improvised due to the fact that two different performers could not spontaneously create the same melody). Example 2.4a contains Zappa's guitar solo from "Peaches En Regalia" (ECE 1969), a solo in which this technique is employed.[29] On the *Hot Rats* performance (Ex. 2.4a), the first eight measures of the solo are doubled an octave higher on the flute by Ian Underwood, while the next four measures of the solo (not included on the example) are not doubled. As a result, the first eight measures will presumably sound composed to listeners, while the last four measures will be heard for what they are: an improvisation. Because the effect produced by the

[28] Frank Zappa, *The Frank Zappa Guitar Book*, (California: Hal Leonard Publishing Co., 1982).

[29] There are several features of this melody that identify it as an improvisation. First, it features guitaristic bends and slurs, which generally do not exist in Zappa's composed melodies. Second, its pitch content is pentatonic (E-major pentatonic), making it fit comfortably under the left hand of the guitarist.

aforementioned octave doubling was as Zappa intended (i.e., sounding composed), later versions of "Peaches En Regalia" were obliged to follow the model established therein. Therefore, the octave-doubled music was treated as an actual composed section while the final four measures, which were not doubled, were left open to free improvisation. This can be verified by inspecting a later live recording of "Peaches En Regalia," as heard on *Fillmore East-June 1971*. However, a comparison Example 2.4a with Example 2.4b—the *Fillmore East* performance of the melody—reveals a number of discrepancies (bracketed on the example).[30] Most likely, these modifications were executed in order to make the melody sound even more "composed" in certain areas. Observe in particular the seventh measure of Example 2.4b, wherein a more distinct repeated pattern appears: a patterning lacking in the original improvisation. After "Peaches En Regalia," this method of overdubbing improvised melodies became a favorite of Zappa's. Other examples include the second guitar solo from "Revised Music for Guitar and Low Budget Orchestra" (ECE1970/1978b) (*Studio Tan,* 4:26–5:52) and the entire "Theme from the 3rd Movement of Sinister Footwear" (ECE 1978/1981c).[31]

Additionally, Zappa experimented with a method related to the aforementioned doubling: utilizing complete transcriptions of solos as bases for compositions. The most well-known example of this procedure is the orchestral third movement of *Sinister Footwear,* based on the same guitar solo as "Theme from the 3rd Movement of Sinister Footwear." Here, the original guitar solo comprises the entirety of the melodic material of the movement, with the melody

[30] The same is true of the *Tinsel Town Rebellion* performance of "Peaches en Regalia," though that version does seem to follow the *Fillmore East* performance more closely than the original *Hot Rats* recording.

[31] As was the case with "Peaches En Regalia," the doubling of the guitar solo on "Revised Music" encouraged the treatment of this guitar solo as a composed section in later performances. In 1991, Zappa enlisted Ali N. Askin to transcribe the solo so this section could be incorporated into an ACE version of the piece, which can be heard on "Revised Music for Low Budget Orchestra" on the album *Greggery Peccary & Other Persuasions* (2004).

stated in octaves or unison by various orchestral instruments.[32] This same technique is utilized in the second movement of the piece *Sad Jane* (ACE 1987), the majority of which is based on a guitar solo from 1968.[33] A significantly more complicated example of a guitar-solo based piece is “While You Were Art” (SYN 1986b), based on the studio-recorded solo “While You Were Out” (1979/1981b). According to Zappa, the transcription of the original solo was simplified by rounding each rhythmic value to the nearest 32nd note; then, the melodic line was “hocketed,” with the pitches rapidly passing between different instruments, creating a “pointillistic” effect completely distinct from that of the original solo.[34]

For the purposes of this study, the most significant result of Zappa’s focus on the guitar was its spawning of music in the *hybrid* style. Such music consists of “composed” passages that share important characteristics with the guitar solos. The term “hybrid” is thereby an indication of stylistic allegiance to both improvised and composed methods. Many tell-tale signs of hybrid composition are found in metrical or accompaniment details. First, all hybrid music features a *fixed meter* throughout, thereby adopting the metrical model of the guitar solos. More fundamentally, the hybrids manifest *harmonic stasis* in their accompaniments. In the solos, this harmonic stasis is complete, with solos typically accompanied by a single harmony, or occasionally two chords alternating regularly. Zappa claimed that this tendency was inspired by Indian classical music, where “one creat[es] melody from scratch based on an ostinato or single chord that doesn’t change.”[35] In the hybrids, harmonic stasis exists on a more local level;

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[32] This work has never been officially released, but a bootleg concert recording exists of a performance by the Berkeley Symphony Orchestra in 1984.

[33] Zappa’s reasons for choosing these two solos were apparently the same: because, in his words, they “sounded so composed.” Dan Forte, “An Interview with Frank Zappa,” *Mix*, June 1983.

[34] Robert Doerschuk and Jim Aikin, “Jazz From Hell,” *Keyboard*, February 1987.

[35] David Mead, “Unholy Mother—Frank Zappa,” *Guitarist Magazine*, June 1993.

therefore, chords do change, but the overall harmonic rhythm remains very slow. Typically, harmonic shifts occur *between* but not *within* phrases.

Melodically, the solos and hybrids are even closer in character. As a point of comparison, consider Examples 2.5a and 2.5b, which present the opening melodic phrases of the hybrid piece "Mo 'N' Herb's Vacation I" (ACE/ECE 1978/1983c), and the improvisation that formed the basis of "Theme from the Third Movement of Sinister Footwear" (1978/1981c). First, both examples exhibit the same generic melodic profile at the phrase level, which Bernard has described as having "the character of riffs, with their rapid patter ending in a sustained pitch."[36] Zappa characterized this approach to phrasing as being based on the concept of "balance—long sustained events versus grupettos [sic] that are happening with a lot of notes on one beat."[37] Many rhythmic details also relate Examples 2.5a and 2.5b. As can be seen, both melodies favor rhythmic subdivisions in prime numbers.[38] Though it is questionable whether the improvised rhythms of Example 2.5b were "planned" as quintuplets, septuplets, etc., Zappa was quick to exploit the fact that his transcribed solos looked superficially similar to his composed works (the hybrids), as it allowed him to further equate these two products of his melodic imagination. The first phrase of the hybrid "Mo 'N" Herb's Vacation I" (Example 2.5a) is, in fact, an idea excerpted from a 1976 guitar solo from the song "Cruising for Burgers" (*Zappa In New York*, 3:48–4:14).[39] The following "composed" phrases of "Mo 'N' Herb's Vacation"

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[36] Jonathan W. Bernard, "Listening to Zappa": 91. Bernard makes this point, in fact, in reference to "Mo 'N Herb's Vacation."

[37] Steve Rosen, "One Size Fits All Interview," *Guitar Player*, January 1977.

[38] This aspect will be discussed in much more detail in Chapter 3.

[39] It is uncertain if Zappa himself transcribed this theme. Because this piece originated as a piece for solo clarinet in 1978, the transcription cannot be the work of Steve Vai, who was hired in 1979.

function as continuations of this idea, fitting the same metrical, rhythmic, and phrasal profile. Surprisingly, considering how closely aligned are the hybrids and the solos, the majority of the hybrid pieces were never intended to be performed on the guitar. According to Zappa, "a lot of things start off on the guitar, but wind up being orchestrated events that could never be played on a guitar."[40]

Among Zappa's instrumental works, hybrid-style titles are extremely numerous. Notable examples include, in addition to the music already cited, "Be-Bop Tango" (ECE 1972/1974b), "The Black Page" (ECE 1976/1978a), "Manx Needs Women" (ECE 1976/1978a), "Outrage at Valdez" (SYN/ACE 1992/1993b), "Get Whitey" (SYN/ACE 1992/1993b) as well as substantial portions of Zappa's large orchestral works.

II. Form.

On 19 May 1963, Zappa presented the first public performance of his music at Mount St. Mary's College in Los Angeles. The concert, entitled *The Experimental Music of Frank Zappa*, featured pieces utilizing a mixture of aleatoric techniques, pre-existing tape recordings, and improvisation. During the question-and-answer session that followed the concert, some of the audience members took Zappa to task for what they heard as a lack of "structure" in the music. Zappa responded:

> Do I have to tell you that's a sonata allegro? I mean, what difference does it make? It's got a shape to it; it's got a diagram that tells (the performers) when to play and when to be quiet and when to improvise. That's a structure. And it doesn't have to be something that's been hanging around for hundreds of years."[41]

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[40] Paul Zollo, "The SongTalk Interview," *SongTalk*, Volume 2, Issue 5, 1987.

[41] Transcription by author of original broadcast on KPFK, May 19, 1963.

These comments suggest that Zappa's approach to form was at odds with "traditional" formal models. However, generalizing about Zappa's formal procedures is fraught with difficulty. He could, on the one hand, employ fairly conventional formal schemas (such as A-B-A), while many other pieces adopt unfamiliar formal principles. Later in his career, Zappa compared the formal design of some of his more adventurous compositions to the mobile artworks of Alexander Calder (1898–1976), whereby "a large mass of any material will 'balance' a smaller, denser mass of any material."[42] A more advantageous avenue for our discussion is offered by Bernard, who identifies two trends in Zappa's treatment of form: (1) "forms relying upon repetition of some kind"; and (2) "episodic forms, consisting of a series of motivic, thematic and/or other elements that are essentially non-repeating."[43] The following discussion will likewise be devoted to the formal implications of repetition and non-repetition in Zappa's music.

A. Non-repeating forms.

We will begin with those works involving no *melodic* repetition. In this category belong, almost exclusively, the guitar solos and the titles derived from the solos. Formally, these works are essentially through-composed and non-sectional, with a "non-progressive," changeless profile. Harmonically, this lack of forward motion is the result of stasis, as discussed previously.[44] However, the lack of melodic repetition is also an important factor in the experienced absence of progression. In the solos, priority is given to melodic invention: a

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[42] Frank Zappa and Peter Occhiogrosso, *The Real Frank Zappa Book*, 162. Zappa recognized the importance of this aesthetic to Varèse's music, who was similarly fascinated by Calder's art.

[43] Jonathan W. Bernard, "Listening to Zappa," 86.

[44] Of prior theoretical concepts, the guitar solos are consistent with Jonathan Kramer's discussion of "vertical time," a sub-category of non-linear time in which "nonlinearity predominates over linearity." Jonathan Kramer, *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (New York, London: Schirmer, 1988): 57.

constant process of renewal. Non-repetition further insures that motivic development—beyond a single phrase (or at most two consecutive phrases)—is effectively ruled out. Therefore, it is rare for any particular melodic phrase in a solo to carry more rhetorical weight than the other phrases. With few exceptions, these phrases could be reordered without changing the overall effect of the music. Without an internal hierarchy among phrases, the traditionally important formal roles reserved for "beginnings" and "endings" are no longer held. Zappa's solos seem often to begin "in the middle," and, even more importantly, their endings are often heard as arbitrary. In sum, they demand a listening strategy that is firmly situated in the present.

Given their conceptual basis in the guitar solos, the hybrids titles are similarly heard, at least to a degree, as non-progressive. However, because hybrids are not completely static harmonically, some forward motion is achieved at each shift in harmony. The degree of forward thrust produced by these changes in harmony is context dependent. For example, in the hybrid piece "The Black Page #1" (ECE 1976/1978a), chords typically shift every one or two measures, creating an expectation on the part of the listener for the progressive continuance of this pattern. However, from mm. 9–16, a single D-sus2 chord (D-E-A) is sustained throughout. The harmonic stasis of this lengthy relatively segment weakens the impression of forward progress heard prior, and the resumption of linearity is achieved only when the harmony finally shifts at m. 17. Among the more harmonically linear of Zappa's hybrid pieces is "Sinister Footwear II" (ECE/ACE 1977/1984b), wherein the bass pitch of each successive harmony in the first 44 measures is a semitone lower than that of the harmony preceding it. This large-scale chromatic bass line provides the passage with a strong progressive trajectory rarely found in the hybrid works.

While hybrid titles may exhibit a greater degree of harmonic thrust than the guitar solos (and derivatives), they are nevertheless consistent with the solos in relation to melody and phrasing; that is, they *tend* towards non-hierarchy and non-repetition. However, this tendency is not as absolute as in the guitar solos. As will be seen in the following section, repetition is occasionally found in the hybrids, creating the potential for the articulation of various formal structures. Without these repetitions, however, hybrids can be particularly challenging to comprehend formally. In those hybrids that are entirely non-repeating, one could theoretically rearrange the various phrases and lose little in terms of continuity (for example, in the individual sections of "Mo 'N' Herb's Vacation I"). Zappa often reserved his most extensive hybrid passages for his large ACE pieces, wherein these sections are placed among various contrasting blocks of material. Two remarks from Bernard are indicative of the challenges posed to listeners by these works:

> . . . [I]t also seems consistent to a fault: the piece ends up so monochromatic, in terms of texture, dynamics, tempo, and overall pacing, that paradoxically it is very difficult to follow except from moment to moment.[45]

> The absence of any clues as to how to organize the listening experience is quite bewildering. . . . The thematic-episodic materials, while definitely non-repeating, are not all that qualitatively distinct from one another. Many of Zappa's lines in these pieces, in the general type of contour they exhibit and in their rhythmic design, are very much alike.[46]

As has been suggested by the preceding discussion, the experience described by Bernard is a natural product of the basis of the hybrids in the guitar solos. Therefore, to experience such music effectively, the listener is encouraged to be content listening "moment to moment."

B. *Forms utilizing repetition.*

Having generally considered non-repeating forms, we now turn to the issue of repetition, and its formal significance, in Zappa's music. Though one finds in equal measure the

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[45] Bernard, "Listening to Zappa," 87.

[46] Ibid., 91.

employment of both strict (unvaried) repetition and varied repetition in this repertoire, the following discussion will be devoted to methods of varied repetition. I will focus on two commonly-employed techniques of melodic variation: (1) contour retention and (2) isomelism.

1. Contour Retention.

By *contour retention*, I refer a type of repetition that, in relation to a melody's pitch succession, preserves the contour of a melody but not its succession of intervals. For the purposes of the present discussion, I will employ two basic analytical tools for describing a melody's contour: (1) the *contour adjacency series* (CAS), which lists the upwards (+) and downwards (-) motions between the pitches of a given melody; and (2) the *contour segment* (CSEG), which gives a more complete picture of the contour as a whole, each pitch in a contour numbered from lowest to highest, assigning the integer 0 to the lowest pitch in the contour.[47] Two contours with the same CSEG are considered more similar than two contours that only share the same CAS, as the former also necessarily includes the latter. As will be demonstrated, Zappa's variation technique, as it applies to melodies with the same contour, is most often to preserve the CAS while varying the CSEG, thereby maintaining what is most essential to a contour while shuffling some relations between the various contour pitches.

Contour retention is certainly less often employed as a formal device in Zappa's music than the next concept to be discussed, isomelism. Contour relations are typically confined to local occurrences, highlighting melodic correspondences or creating unity within passages. There are far too many examples of these types of contour relations in Zappa's music to cite;

[47] Michael Friedmann, "A Methodology for the Discussion of Contour: Its Application to Schöenberg's Music," *Journal of Music Theory* 29/2 (1985): 223-48; Elizabeth West Marvin and Paul Laprade, "Relating Musical Contours: Extensions of a Theory for Contour," *Journal of Music Theory* 31/2 (1987): 225-67.

however, one particularly extensive example of local contour retention is given in Example 2.6, the beginning of the post-solo section from the piece “Alien Orifice” (ECE 1981/1985). As the example shows, nearly every discrete four-note segment in the passage has a CAS of <+, -, +>. In regards to CSEG representations of the <+, -, +> contour, however, Example 2.6 indicates a high degree of variation at work in the passage. Among the ten <+, -, +> contours, there are five different CSEGs employed: <1302>, <1202>, <1201>, <2301>, and <1203> (in order of appearance). Also, it should be noted that none of the CSEG correspondences in the passage, such as the multiple <1302> and <2301> contours, are the result of transposition between like segments. In this passage, therefore, it is the high degree of <+, -, +> CAS correspondences that provides the unifying thread for the passage, while variety is achieved with CSEG variation.

Among examples in which contour retention influences the larger form of a piece is “G-Spot Tornado” (SYN/ACE 1986b). The A section of this piece features a 12-measure theme (consisting of three four-measure phrases) that is subsequently restated three times, each modified to varying degrees. These thematic statements will be chronologically labeled A1 through A4. Of the variations of A1, A3 is the most similar, involving only slight modifications, while A4 is the most dissimilar. How, then, does one hear A4 as a variation of A1? Example 2.7 provides both the A1 and A4 statements of the theme, arranged so that corresponding measures between the statements are aligned. A1 and A4 are related by a simple pitch substitution chart, which is also given on the example. All bracketed portions of A4 conform to the chart; as can be seen, only a few pitches of A4 remain unaccounted by the chart.[48] As the substitution chart indicates, three out of the five pitches of A1 move by T2 to their counterparts in A4. The

[48] Most of these unaccounted pitches are simply T2 related from A1. The second half of the first measure of A1 has been replaced by the corresponding phrase from A3. As was mentioned above, A1 and A3 are extremely similar, differing only in a few small details. Therefore, the substitution chart that relates A1 and A4 is perhaps best thought of as a chart that compares A4 with both A1 and A3 in tandem.

remaining two pitches, A and E, move by T4 and T3, respectively. The two notes that are not T2-related result in contour discrepancies between A1 and A4. The T4 relation between the pitch A of A1 and C# of A4 is the most significant, as it results in a repeated pitch C# in A4. As is shown on Example 2.7, this repeated C# causes most of the CSEGs of A4, considered measure-to-measure, to be slightly modified from those of A1 (with the exception of the final measure of each phrase). (Note: measures with different CSEGs are checked with an (x).) In relation to the CAS for each measure, neither the repeated C# nor the T3 relation between the E of A1 and G of A4 cause any significant modifications. Only two of the twelve measures of A4 are represented by a different CAS than of their corresponding measures of A1 (also marked with an (x)). In sum, this example further demonstrates Zappa's practice of altering CSEGs while maintaining the CAS in melodic repetitions.

A final example, from "The Black Page #1" (ECE 1976/1978a), demonstrates some of the limitations of contour retention as an agent of large-scale repetition. This piece was originally conceived as a drum solo; in that form, it exhibited a very simple A-A' form, each section fifteen measures in length, with the first eleven measures of both sections being rhythmically identical. When Zappa composed a melody to be played in the rhythms of the drum solo—thereby creating "The Black Page #1"—one would assume his most logical option for the placement of a melodic recapitulation would be at m. 16, when the rhythmic sequence of m. 1 begins to repeat. However, as Example 2.8a shows, Zappa decides instead for contour retention at measure 16, reserving the true melodic recapitulation for m. 19.[49] As can be seen in Example 2.8a, the technique of contour retention here is similar to the preceding examples in that

[49] The reasons behind Zappa's decision to withhold the melodic recapitulation at this point will be considered in Chapter 3.

the CAS of the melody is maintained while the CSEG is varied. On Example 2.8a, the CAS-identical portion of the melody at m. 16 is underlined.

There are a number of factors that make the contour relation in "The Black Page #1" less than satisfying from a formal standpoint. First, the CSEG variation that occurs between A and A' is more extensive than in the preceding example. Considering the contours created within each of the corresponding quarter-note beats individually, none have identical CSEGs. Second, as can be seen, the CAS of the A statement is not completely maintained at A', particularly at the beginning and end of the phrase. For these reasons, it is likely that most listeners will not hear this contour-related segment as the true recapitulation of the piece. Zappa may well have realized this fact when he revised "The Black Page #1," creating "The Black Page #2" (ECE 1976/1978a). Example 2.8b provides the same corresponding passages for "#2" discussed in relation to "#1." The most notable difference in Example 2.8b is that the A' statement is no longer rhythmically identical to the A statement. As a result, the CAS contour retention between the A and A' statements is all that remains to relate these two passages. From a formal standpoint, the contour relation no longer acts as a viable means by which to achieve formal articulation in "#2." In "#1," m. 16 still held the potential to be heard as a recapitulation, as both contour and rhythm were, for the large part, maintained. Therefore, without rhythmic correspondence, which was a primary feature of both "G-Spot Tornado" and "The Black Page #1," contour retention is perhaps a less-than-ideal technique of formal repetition.

2. Isomelism.

Of Zappa's techniques of varied repetition, *isomelism* is by far the most pervasive, often extending its influence into the realm of musical form. In the context of Zappa's music, my use of the term isomelism refers to a technique in which a melody's succession of pitch classes (and often just pitches) is preserved (or transposed) while its rhythms are altered.[50] In certain respects, isomelism may be viewed as a polar opposite to contour retention. As was shown in the two preceding examples of contour retention, the preserved aspect of the original melody was its rhythm, while its pc succession was varied in such a way as to maintain its contour. In isomelism, this equation is switched: it is the rhythm of the original melody that is subject to variation. In other aspects, however, isomelism and contour retention are closely aligned. Specifically, the technique of isomelism often has contour retention as its natural result. That is, when Zappa applies isomelism, he rarely places any of the pitches of the original melody in different octaves from their original position, thereby maintaining the contour of the melody.

Among the possible influences on Zappa's use of the isomelic technique, two seem the most plausible. The first of these is Stravinsky, who employed the procedure at various times throughout his career. Just considering the early ballets, of which Zappa was particularly familiar, David Carson Berry has detailed a number of notable instances of the isomelic principle at work.[51] On the other hand, Zappa's employment of isomelism may have come out his short-

[50] This is a slightly more limited definition of isomelism than that offered by David Carson Berry, who defines it as applicable to variations that "maintain the theme's pc succession, but cast it in different rhythms and contours, as well as place it in new harmonic or contrapuntal settings." David Carson Berry, "Stravinsky's 'Skeletons': Reconnoitering the Evolutionary Paths from Variation Sets to Serialism," (Ph.D Dissertation, Yale University, 2002): 13. As will be shown, Zappa's procedure is most often to maintain the contour of the melody as well as its pc succession. The term isomelism originates with Heinrich Besseler, *Die Musik des Mittelalters und der Renaissance* (Potsdam: Akademische Verlagsgesellschaft Athenaion, 1931; repr. Wiesbaden: Akademische Verlagsgesellschaft Athenaion, 1979): 206. Isomelism is also discussed by Richard Taruskin, *Stravinsky and the Russian Traditions* (Berkeley: University of California Press, 1996): 1637, n47.

[51] David Carson Berry, "Stravinsky's 'Skeletons'": 22-26.

lived interest in composing with the serial technique (to be discussed in Chapter 5). There are a number of similarities between isomelism and serialism, particularly considering the fact that Zappa does occasionally couple isomelism with transposition, one of the canonical transformations of serialism. Berry has also noted the correspondences between serialism and isomelism, remarking in summary that "what remains constant [in isomelism] is essentially a succession of ics, as in the various transformations of a 'row' or 'series.'"[52] Significantly, however, the "series" in Zappa's music is never a twelve-tone row. As the following examples will show, both diatonic and chromatic themes are treated with this technique. In 1990, Zappa stated, "there are certain serial procedures that you can use for tonal music, too, and I do that *all the time*."[53] Without further elaboration by Zappa, we cannot be certain that he is referring to isomelism, but this comment does offer circumstantial evidence that serialism was influential on his isomelic technique.

Example 2.9, the main theme from "Oh No" (ECE 1967/1968b) is characteristic of Zappa's approach to isomelism.[54] This excerpt features two phrases, the first from mm. 1–6 and the second from mm. 7–14. As the example shows, the second phrase is an isomelic variation on the first phrase. The pitch succession of the first phrase is replicated exactly in the second phrase, with the only discrepancy being the repetition of pitches #16–#19 at mm. 11–12, itself a small-scale isomelism. Further, the octave placement of all the pitches of phrase 1 are preserved in the second phrase. Therefore, there are no contour discrepancies between the phrases. The

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[52] Ibid., 43.

[53] Den Simms, Eric Buxton, Rob Samler, "They're Doing the Interview of the Century," *Society Pages*, April 1990.

[54] This example is also cited in Jonathan W. Bernard, "Listening to Zappa," 80. This phrase is certainly among the earliest examples of isomelism in Zappa's music. Keyboardist Don Preston contends that he performed this piece with Zappa in the early 1960s. Billy James, *Necessity Is . . . The Early Years of Frank Zappa and The Mothers of Invention* (London: SAF Publishing, 2000): 30.

most striking feature of the variation process here is the high degree of rhythmic differentiation; indeed, phrase 2 sounds like an entirely new melody. Comparing the phrases measure-against-measure, no two measures are rhythmically identical, causing pitches to "spill over" into measures in which they previously did not belong and thereby creating new melodic groupings (or negating ones formerly established). For example, mm. 3–4 of phrase 1 feature a repeated triplet rhythm that creates a quasi-sequential relationship from pitches #10–#15. In phrase two, these pitches are no longer heard as related; instead, pitches #12–#15 and #16–#19 are set in a similar rhythm and thereby linked. Yet, as is indicated by the bracketing on Example 2.9, there are several rhythmic correspondences between the phrases whereby certain pitches appear in the same metric position and with the same rhythmic value. The most important of these is the phrase-opening pitch D, which appears as a quarter-note value on the second beat of the both phrases. These correspondences increase the aural salience of the isomelic relationship between the phrases.

As was true of contour retention, isomelism appears in various guises in Zappa's works. In this study, the concept will be invoked often, as its employment often highlights interesting musical relationships in different contexts. For the present, I would like to discuss the role of isomelism as an agent of form-defining varied repetition. One possible scenario for its employment in a formal context is to build a piece entirely from a single melodic theme. This scenario is very nearly followed in the short (32 measure) instrumental interlude from the song "Jumbo Go Away" (ECE/ACE 1979/1981c). In this piece, a single melodic line, stated at its opening (mm. 1–3), is treated to isomelic variation at both mm. 4–7 (a T11 transposition) and at mm. 13–15. Example 2.10 provides all three separate occurrences of the melody. As can be seen, each varied form of the melody maintains the pitch succession of the original line but drastically alters its rhythmic profile and character. The first isomelic variation (Example 2.10b) shares one rhythm with the original line, between notes #4 and #5; only here, as opposed to "Oh No," the shared rhythms do not fall in the same metrical position. The second employment of the technique (Example 2.10c), on the other hand, is rhythmically homogeneous, consisting entirely of sixteenth-note durations. How do these varied repetitions define the form of the piece? Essentially, the process of isomelism creates nearly all of the rhythmic and melodic material of the piece. That is, all the music not given in Example 2.10 is directly related to the *isomelic variations* in the piece. For example, mm. 11–12 contain two partial statements of the melody (pitches #1–#5), both based on the rhythms of the first isomelic variation (Example 2.10b). The remainder of the music not discussed thus far (mm. 8–10 and 16–32) is rhythmically, but not pitch, identical to the second variation (Example 2.10c).[55] These two phrases (mm. 8–10 and 16–32) are identical for their first twelve pitches; the first foreshadows the appearance of the second isomelic variation, while the second spins out of the second variation and serves as a motivic liquidation for the piece as a whole.[56] In sum, this piece demonstrates how isomelism can define the entirety of a non-sectional work.

Among musical forms, perhaps the most natural place for the utilization of the isomelic technique would be within a work in variation form. However, there are relatively few works by Zappa that are strictly in variation form, and most of them—including "The Dog Breath Variations" (ECE 1969a)—do not incorporate isomelism to a significant degree.[57] "Be-Bop

[55] The pitch relationship between these sections will be discussed later in this study.

[56] Liquidation, a term associated with Schoenberg, refers to the "systematic elimination of characteristic motives." William E. Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (Oxford and New York: Oxford University Press, 1998): 11.

[57] There are, actually, some subtle isomelic relationships between the various statements of the theme in "The Dog Breath Variations." However, they are not as rhythmically differentiated as those we have discussed thus

Tango" (ECE 1972/1974b) exploits some of the potential in the isomelic technique for variation form. Rhetorically, the piece is one of Zappa's "hybrid" compositions, sharing all the generic features discussed earlier in this chapter. However, for the first thirty measures of the piece, a pattern of repetition is established such that the work resembles a set of variations. The main theme of the work is stated at mm. 4–6 (Example 2.11a).[58] It is subsequently restated, utilizing the isomelic technique and un-transposed, at m. 12 (Example 2.11b) and m. 23 (Example 2.11c). What is interesting about both of these variations is that they represent a greater freedom in the employment of isomelism than witnessed thus far. In the first variation (Example 2.11b), for example, pitches #8 and #9 switch places and three of the pitches (#4, #7 and #9) appear twice. In variation 2 (Example 2.11c), on the other hand, the succession of pitches from the main theme is retained, but many of the notes appear in the different octaves from their original place. Specifically, pitches #5, #6, #7 and #10 appear an octave higher and pitches #9 and #11 are an octave lower than in the first statement. As a result, both variations alter the contour of the original melodic line. From a formal standpoint, these three statements of the theme close off the "variations portion" of the piece; the subsequent music is much more non-progressive in nature. Therefore, the periodic appearances of the theme in the first half of the piece create a degree of formal organization that would otherwise be lacking in such a hybrid work.

Isomelism often supports A-B-A form, or other formal schemes that approximate symmetry, in Zappa's music. "Manx Needs Women" (ECE 1976/1978a), for example, manifests a simple A-B-A' design, the A' section of which is heralded by an isomelic relation with the opening melodic gesture (Example 2.12). However, as can be seen in Example 2.12, the

far and, therefore, are not particularly significant. More significant isomelic relations exist between the song "Dog Breath (In the Year of the Plague) and "The Dog Breath Variations." These will be described in Chapter 3.

[58] The measure numbering for the score is somewhat idiosyncratic, as the first four measures are labeled A through D. Therefore, what I am calling measure 4 is more properly heard as measure 8.

variation that opens A' is much more rhythmically distinct than the original melodic statement. In fact, the first presentation of the theme is performed so fast that it is doubtful that any listener will hear the isomelic relationship shown in the example. Instead, the isomelic technique reinforces the fact that both A and A' are composed in the hybrid style; therefore, the recapitulation not only restates a "main theme," but also recapitulates a stylistic category.

Another common approach to A-B-A' design in Zappa's works is to set the B section as a solo (or a series of solos) and achieve a complete recapitulation via isomelism. This is the scenario followed in the piece "Rollo" (ECE 1972/1988b). In this music, roughly six measures of the eighteen-measure A section are recapitulated via isomelism at A'. It requires 23 measures for A' to play out the entirety of this isomelism, allowing also for interjections by non-isomelic material.[59] An even more striking example of this phenomenon is found in the piece "Big Swifty" (ECE 1972b). The interesting fact about this A B A' form is that it is achieved not by a "composed" isomelism, but by one that arose from an improvisation within a form that was originally A-B (theme-solos). As Zappa explained:

> The restatement of the theme is actually derived from a guitar solo on the album which Sal Marquez took down on paper. After about an hour of wheeling the tape back and forth, Sal managed to transcribe this rhythmically deranged chorus (I don't have the ability to do this kind of musical dictation, but, since Marquez had a full-bore education at North-Texas University *[sic]*, he had it covered). After he'd written it out, we proceeded to over-dub three trumpets on it, and, presto: an organized conclusion for "Big Swifty."[60]

Zappa is of course describing the post-solo overdub technique described earlier in this chapter. What he fails to mention in this quote is that this restatement is achieved entirely with the isomelic technique: that is, by stating the theme in new rhythms. Example 2.13a provides a portion from the beginning of the theme (2.13a) and its isomelic variation (2.13b). Zappa applies

[59] The A section of this piece first appeared on record within the song "St. Alfonzo's Pancake Breakfast" on the album *Apostrophe* (1974).

[60] Frank Zappa, "The Complete History of Last Week's Mothers of Invention/Hot Rats/Grand Wazoo," *Circular*, Vol. 4, no. 40, October 9, 1972.

this technique for a total of 37 measures in A', covering the first 42 measures of the original theme.[61] While some of the isomelism involves simple augmentation of the original rhythmic values, other ideas are significantly altered. For example, the corresponding passages given in Example 2.13c and 2.13d show that, in Zappa's first attempt at this portion of the melody (Ex. 2.13d), he subverts the descending sequence of the original theme (Ex. 2.13c). When Zappa states this melody again nine measures into Example 2.13d, he is much more careful to maintain this sequential relation.

A multi-pronged employment of isomelism in service of A-B-A' form is observed in "Mo 'N' Herb's Vacation I" (ACE/ECE 1978/1983c). This work features a number of isomelic relationships throughout the piece, most of which are quite local and thereby not form-defining. The form of the piece as a whole is A (mm. 1–37) B (mm. 38–59) A' (60–end), with each section, considered individually, in the hybrid style. These sections are distinguished from one another in part by changes in meter; the A sections are in 4/4 while the B section is in triple meter.[62] However, repetition of materials from the A section also contributes to the articulation of the A' section, as its start is heralded first by transposed repetition (mm. 60–62) and then by isomelism-plus-T6-transposition (m. 63). The phrases related by the isomelic technique are provided in Example 2.14. Although these repetitions clearly connect the two A sections, their weight as true "recapitulations" is somewhat weak, as none of the recapitulated material represents the "main theme" of the piece. Perhaps an easier avenue in which to hear the A-B-A' form of the piece is provided by an isomelism within the B section. Example 2.15 displays two

[61] In subsequent versions of "Big Swifty," this isomelic variation was performed as if it was a "composed" section and was even provided a new accompaniment that fit more naturally with it (as opposed to the single chord accompaniment of the original performance).

[62] As will be discussed later in this study, the sense of meter in this piece is fairly weak, so these changes in meter are difficult to perceive.

phrases related by this technique, as well as T1 transposition, from the B section. These two phrases play a much clearer formal role within the piece, as the first phrase (Ex. 2.15a) initiates the B section, while the second (Ex. 2.15b) terminates the section. Therefore, the two statements of this melody achieve closure for the B section as a whole, setting it off from the A sections.

As a culmination to my discussion of isomelism in formal contexts, let us investigate "Inca Roads" (ECE 1973/1975a). This music was first premiered as a compact instrumental in 1973 and was subsequently revised to a much longer version (as heard on *One Size Fits All* (1975)). But whereas similar revisions to titles such as "RDNZL" involved the expansion of each section of the original work, the revision of "Inca Roads" leaves the original more or less intact within the larger form (with the only exception being the substitution of a keyboard solo for the earlier trombone/flute solo). The revision, however, interpolates a number of new sections, nearly all of which are created by isomelism. Figure 2.1a is a formal outline of the original composition, as heard on the album *The Lost Episodes* (1996). As the figure shows, the original piece is a simple A (theme) B (solos) A' (theme) form with three distinct thematic elements: a two-part main theme (Theme 1), a "link" that separates the two parts of Theme 1, and an unaccompanied melodic theme that closes the B section (Theme 2).

Consider now the formal outline for Zappa's revision of "Inca Roads," given in Figure 2.1b (note: this figure employs the same labels as Figure 2.1a). As can be seen, all three thematic elements of the composition are provided isomelic variations in the revision (these isomelic variations are indicated by bold typeface on the figure). The variations applied to Theme 1 and the link are particularly extreme. Theme 1, for example, appears herein with a text affixed to its melodic line; additionally, its character is substantially altered. It is no longer separated into two parts by the link, but is instead continuously interrupted by excerpts from an entirely different piece ("Approximate" (ECE 1972/1988c)).[63] (Due to the length of this section, I have not included musical excerpts). The link, previously a short burst of notes (Example 2.16a), is now primarily set as even sixteenth-note values (Example 2.16b) and is repeated four times. The link now functions as a formal transition, first to the guitar solo and then to a new isomelic variation of Theme 1 (part 2). The most interesting aspect of the isomelic process in the revision is that the variations *precede* the "original" composition. Therefore, when the A section enters at 5:41, the "original" piece sounds like the isomelic variation (i.e., as opposed to the opposite scenario, which represented the actual compositional process). This reversal of functions extends also to the isomelic variation of Theme 2 (at 6:05), which likewise precedes the B section, in which its original version appears. In sum, isomelism is exploited in "Inca Roads" to particularly creative ends.

Summary remarks.

In this chapter, various aspects of style and form have been explored in Zappa's music. Regarding *style*, I have detailed two important elements of his early musical education: (1) Zappa's childhood fascination with the musical score, which contributed to his interest in musical complexity and also factored in his preferred "on paper" method of composition; and (2) his rejection of formal studies in music theory, which, given his lack of training in voice-leading and counterpoint, had a decisive effect on the types of musical textures found in his music. Also discussed has been the role of Zappa's guitar playing in his compositional style. The most important aspects of this influence were shown to be the resulting emphasis on melodic composition as well as the spawning of the "hybrid" style. Finally, *form* in Zappa's music has

[63] It is very likely that the isomelism of Theme 1 was never "written down," instead being created in rehearsals in conjunction was Zappa's keyboardist George Duke, who sings this melody.

been discussed in relation to various treatments of melody. Non-repeating forms, which were shown to produce non-traditional formal structures, were observed in the guitar solos (and derivatives) and well as the hybrids. Finally, in relation to forms utilizing repetition, I have described two techniques of varied repetition—contour retention and isomelism—and their employment as form-defining agents.

CHAPTER III

RHYTHM AND METER

Introduction.

From the outset of Zappa's involvement in music, rhythm was of central importance. As was recounted in Chapter 2, Zappa's first musical instrument was percussion, which he began studying around the age of twelve. By his accounts, these studies were very casual, including little more than a summer group course in orchestral percussion. His inclination towards "the sounds of things that a person could beat on" was reinforced when he discovered the music of Edgard Varèse nearly two years later, taking a particular liking to Varèse's piece "Ionisation" (1929–31) for its heavy percussion scoring.[1] Alongside an enthusiasm for post-tonal classical music sparked by Varèse, he developed a competing interest in R&B music, even playing the drums during his high-school years in a band called The Ramblers. Little came of this experience for Zappa as a performer, as he claimed that he "never learned to coordinate my hands and feet" and was soon fired from the band.[2] These failures aside, the fruits of his youthful interest in drumming were ultimately manifested in the emphasis he afforded to matters rhythmic or metric in his music.

In the present chapter, we will see that the aforementioned allegiances to both post-tonal classical styles and rock/pop music were vital to the rhythmic and metrical techniques that Zappa developed in his instrumental compositions. The primary topics of the chapter are various types of metrical and rhythmic *conflict*, which will be interpreted in part as an attempted merging of

[1] Frank Zappa and Peter Occhiogrosso, *The Real Frank Zappa Book* (New York, NY: Touchstone, 1989): 29.

[2] Ibid., 29.

popular and art-music techniques. Accordingly, the discussion is divided into two large sections devoted to *meter* and *rhythm*, respectively. This arrangement suggests an inherent distinction between the two terms.[3] These differentiations will prove important, as my discussion of metrical procedures, including polymeter and *metrical dissonance*, will provide the necessary conceptual framework for our comprehension of the rhythmic technique most associated with Zappa's music: *rhythmic dissonance*. It is this phenomenon to which the bulk of this chapter is devoted, as it represents Zappa's most original solution to integrating the rhythmic and metrical characteristics of popular and art music.

I. Meter.

A. Early metrical practices.

In Zappa's early recorded output (i.e., the music performed by the original Mothers of Invention), his devotion to the rhythmic/metrical language of his predecessors is most visible. Stravinsky's music, in particular, factors heavily in many of Zappa's early metrical practices.[4] At the time, he explained: "I'm bringing 'music music' [serious or classical concepts] to our rock arrangements. Stravinsky in rock is like a get-acquainted offer, a loss-leader. It's a gradual progression to bring in my own 'serious' music."[5] Clear evidence of this influence is seen in the heavy usage of asymmetrical meters, shifting meters, and "polymeter" in Zappa's early titles. When asked to distinguish his music from the majority of the rock music of the time, he cited the

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[3] Later in this chapter, I will consider the pros and cons of conceptually separating rhythm from meter.

[4] Stravinsky's music was quoted extensively in Zappa's albums even before he began incorporating his own instrumental works into his albums. For example, the album *Absolutely Free* (1967) includes four separate quotations from Stravinsky's works. These quotations are found in the tracks "Amnesia Vivace" (Rite of Spring, The Firebird), "Soft-Sell Conclusion" (L'histoire du soldat) and "Status Back Baby" (Petrushka).

[5] Robert Shelton, "Son of Suzy Creamcheese," *New York Times*, December 25, 1966.

use of some of the aforementioned devices, such as "time signature changes, rhythm changes," and claimed "you sure can't dance to it, so now they're listening."[6] Nevertheless, Zappa's employment of these techniques is also informed by the conventions of rock/pop music of the time. Therefore, in the following section, we will see certain "constraints" placed upon the metrical structures produced by these techniques. This will serve as an introduction to more general issues at play in Zappa's music, particularly the subversive potential of employing advanced rhythmic/metrical methods in the context of rock/pop styles.

Before proceeding further, we must define some metrical terms and concepts relevant to our discussion:

The rhythmic unit and the tactus. The most basic element necessary for the construction of meter is the presence of what I will call the *rhythmic unit*: an evenly spaced (isochronous) pulse that is usually directly stated in the music.[7] By default, the rhythmic unit should usually be identified as the fastest persistent pulse in the music. Another pulse level of interest is that of the *tactus*. Lerdahl and Jackendoff describe the tactus as "the level of beats that is conducted and with which one most naturally coordinates foot-tapping and dance steps."[8] While different listeners may hear different pulse levels as the tactus, Zappa's music normally assumes a tactus at a slower pulse rate than the rhythmic unit, being usually a duple, triple, or quadruple grouping of the rhythmic unit.[9]

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[6] Jerry Hopkins, "Interview with Frank Zappa," *Rolling Stone,* July 1968.

[7] This term is suggested by Richard Cohn, who refers to the fastest pulse level "worth noting for the analytic purposes at hand" as the "smallest *unit* of equal division." Richard Cohn, "Metric and Hypermetric Dissonance in the Menuetto of Mozart's G Minor Symphony, K. 550," *Integral* 6 (1992): 6.

[8] Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge and London: MIT Press, 1983): 71.

[9] As we will see, the notated quarter note is often selected as tactus by Zappa.

Meter and its categories. After Maury Yeston, meter is viewed as the product of the interaction between two pulse levels, "the faster of which provides the elements and the slower of which groups them."[10] Meter exists at different levels, including the small-scale metrical interpretation of the rhythmic unit by the tactus to the grouping of the tactus into half-measures, whole-measures, etc. *Hypermeter* is defined as any level of meter above that of the notated measure. In the context of my discussion in the chapter, hypermeter will usually refer to the arrangement of notated measures into larger metrical groups. After Justin London, meters may be divided into two categories: *isochronous* and *non-isochronous*.[11] In distinction to isochronous meters, non-isochronous meters are those that feature non-equivalent groups of a certain pulse level. In Zappa's music, non-isochrony exists most commonly in reference to the tactus. For example, in a non-isochronous meter such as 5/8, with an eighth-note rhythmic unit, the tactus may group the rhythmic unit into non-equivalent 2-3 or 3-2 metrical schemes.[12]

With these definitions in mind, let us turn to a small selection of excerpts from Zappa's early works. The music of "Oh No" (ECE 1967/1968b), which employs shifting meters and non-isochronous meters in tandem, represents a mild interplay of advanced metrical procedures and rock-music norms. As shown in Example 3.1, the first phrase of the composition, two meters are employed, 4/4 and 3/4, which alternate every measure to create regular two-measure hypermetrical units. Reinforcing the regular metrical alternation is an accompanying oscillation in the bass part, whereby each 4/4 measure features the pitch E while 3/4 measures contain A in

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[10] Maury Yeston, *The Stratification of Musical Rhythm* (New Haven and London: Yale University Press, 1976), 66.

[11] Justin London, *Hearing in Time: Psychological Aspects of Musical Meter* (Oxford and New York: Oxford University Press, 2004), 100.

[12] Non-isochrony may also exist at a higher pulse value than the tactus. However, the rhythmic unit is never subject to non-isochrony in Zappa's music.

the bass. Considering the regularity of this alternation, the passage is perhaps better viewed as an example of a non-isochronous meter, as the regular alternation of 4/4 and 3/4 would easily permit a re-barring within the fixed meter 7/4. If viewed as such, the use of non-isochrony here differs from Zappa's typical practice due to the fact that the tactus level (quarter note) is not subject to non-isochrony; instead, it is the notated measures themselves (i.e., the metrical arrangements of the tactus) that are uneven. This distinction is crucial, because such measure-level non-isochrony does not disrupt the listener's ability to clap or dance along to the tactus. Therefore, this excerpt retains two aspects associated with rock meter: (1) an even tactus; and (2) regular, duple hypermeter.

Tactus-level non-isochrony, along with shifting meters, is exploited to more subversive effect in the music of "The Dog Breath Variations" (ECE/ACE 1968/1969a): a variation set based on the melody of the song "Dog Breath, In the Year of the Plague" (both appearing first on the album *Uncle Meat* (1969)). Example 3.2a provides the opening melodic theme of the song "Dog Breath . . . ," which serves as a model for metrical play in "The Dog Breath Variations." As can be seen, the metrical features of the original song are entirely regular, exhibiting a fixed meter (4/4), an even quarter-note tactus, and duple hypermeter. Consider now Example 3.2b, the corresponding passage from "The Dog Breath Variations": an isomelic variation of Example 3.2a. Here, the isomelic technique is necessitated in part by the introduction of shifting meters into the music, which consistently subvert the quarter-note tactus associated with the original song. In the first phrase (mm. 1–4), the 4/4 meter of the original song is present in the odd-numbered measures, while the even-numbered measures shift to 9/8 meter, accompanied by a shift to a dotted-quarter tactus (three rhythmic units as opposed to two). In the second phrase (mm. 5–8), the odd-numbered measures once again feature the quarter-note tactus of the original song, yet now this tactus resides within 3/4 meter. As in the first phrase, the even-numbered measures thwart this pulse with shifts to both the non-isochronous 5/8 (with 2-3 tactus values) and to 9/8. Because the referential quarter-note tactus is always presented first to the listener (i.e., in the odd-numbered measures), the disruptive effect produced by shifts to meters at odds with this tactus is particularly salient.[13]

In the early music, one also finds several examples of polymeter. While true "notated" polymeter is more-or-less confined to these early titles[14], the layering process characteristic of polymeter—and also essential in much of Stravinsky's music—will continue to be of import in Zappa's later music.[15] As with shifting and non-isochronous meters, Zappa's approach to polymeter manifests a sensitivity to rock/pop norms.

The polymetric structure in the main theme of "Pound for a Brown" (ECE/ACE 1967/1969a) establishes a model for most of Zappa's subsequent experiments with the technique (see Example 3.3).[16] As can be seen, two clear layers of activity are in use: (1) a 7/8 metrical layer, created by the ostinato pattern in the lower register; and (2) the now-familiar 4/4 + 3/4

[13] This disruption is especially strong in the first phrase, as the odd-numbered measures here are almost identical rhythmically to the corresponding measures of the original song.

[14] Justin London questions the perceptibility of polymeters, noting that "a polymeter would invoke the presence of two (or more) concurrent metric frameworks." London hypothesizes that, when listeners hear a polymeter, they either: (1) extract a composite and fit it to a meter; or (2) select one meter and hear the other meter(s) against it. Justin London, *Hearing in Time: Psychological Aspects of Musical Meter* (Oxford and New York: Oxford University Press, 2004), 49.

[15] Acutely aware of the unfamiliarity of polymeter in rock music of the time, Zappa would proudly alert his concert audiences to examples of the technique. See, for example, Zappa's on-stage explanation of the polymetrical texture heard within "Toads of the Short Forest" (ECE 1964/1970b) on the album *Weasels Ripped My Flesh*. Frank Zappa, "Toads of the Short Forest," *Weasels Ripped My Flesh*, Rykodisc RCD 10510 (1970): 2:09-2:30. This texture is not part of the theme proper of "Toads of the Short Forest" but is the result on an edit from the studio-recorded theme to an unrelated live event.

[16] According to Zappa, this piece dates from 1957 or 1958, when he was still in high school. Frank Zappa, liner notes to *The Yellow Shark*, Rykodisc RCD 40560, 1993.

alternation, found in the melody and drums.[17] Unlike most potential polymetric pairings, the two metrical layers of "Pound for a Brown" display only slight asymmetry, as they become realigned every fourteen rhythmic units (unit = eighth). In discussion of Stravinsky's ostinati-oriented textures, Gretchen Horlacher defines such a segment, demarcated when non-aligned groupings come into phase, as a *cycle.*[18] In the case of Example 3.3, the periodicity of the 7/8 ostinato (7 units) is half of that of 4/4 + 3/4 (14 units). Therefore, alignment occurs after two iterations of the ostinato figure and one of the 4/4 + 3/4 layer (i.e., two "notated" measures of the melody's meter). The cycle thereby reinforces a duple hypermeter in both metrical layers, with both meters combining to create a cumulative duple effect.[19]

The mild asymmetry of Example 3.3 is in service of duple hypermeter, which again demonstrates Zappa's retention of certain aspects of rock/pop metrical practice even while employing a technique associated with twentieth-century art music. The polymetric procedures of "Oh No" are strongly modeled after those of "Pound for a Brown" and have the same larger goals. In fact, the very same polymetrical pairing of "Pound for a Brown," 7/8 and 4/4 + 3/4, occurs in "Oh No" (see Example 3.4). Here, however, the meters are (horizontally) juxtaposed rather than (vertically) superimposed. As bracketed on the example, 7/8 meter momentarily disrupts the controlling 4/4 + 3/4 meter of the piece. Significantly, the shift to 7/8 persists for the precise length of the cycle (14 units, or two measures) before returning to the primary 4/4 + 3/4

[17] This metrical interpretation is also shared by Jonathan W. Bernard, "The Musical World(s?) of Frank Zappa: Some Observations of His 'Crossover' Pieces," in *Expression in Pop-Rock Music,* ed. Walter Everett, 157–209 (New York: Garland, 2000).

[18] Gretchen Horlacher, "The Rhythms of Reiteration: Formal Development in Stravinsky's Ostinati," *Music Theory Spectrum* 14/2 (1992): 174. In general, the length of a given cycle can be determined by the equation (xy)/z, where x and y represent the two groupings and z is a common factor between x and y.

[19] The essential non-alignment of this passage occurs "between" the barlines of the meters, in the ways in which the different layers group the eighth-note rhythmic unit into tactus values. That is, the 4/4 + 3/4 layer observes an isochronous quarter-note tactus while the 7/8 layer features a non-isochronous (3-4) tactus scheme.

meter. For the passage to be heard as a "true" polymeter, the listener must supply the missing metrical layer during these two measures: a task easily achieved given the close relationship between the meters.[20] Example 3.5, the coda of "Oh No," employs a polymetric pairing that exploits a similar cyclic formula as Example 3.3. These layers include: (1) an alternating 3/4 + 2/4 layer in the bass, which oscillates between the pitches C# and F#; and (2) a drum layer in 5/8.[21] As in "Pound for a Brown," the faster moving meter (here 5/8) has a periodicity half that of the slower meter (3/4 + 2/4) (i.e. 5 and 10). Therefore, the cycle of these two metrical layers is likewise two measures in length, retaining the normative duple hypermeter of rock/pop music.

True polymeter such as that seen in the above examples is seldom found in Zappa's later music, as his interest in polymeter developed into a different phenomenon (to be discussed).[22] With the rise of progressive rock and jazz/rock fusion in the later 1960s/early 1970s, Zappa was also no longer peerless in the world of rock music in his transference of advanced metrical techniques to popular musical styles. Perhaps this reality led him to search for new procedures that he could more rightly call his own. In many ways, this led to a simplification of meter in Zappa's works. However, as we will see, this simplification allowed for greater conflict in other dimensions. As Zappa explained: "We can play in 4/4 and play some awful weird shit in 4/4. By the same token, you can play in 9/16 and play some really boring stuff too, as is evidenced by

[20] Later in this chapter, I will explore Harald Krebs's concept of "indirect dissonance," which is relevant to the present example.

[21] Given that both layers are set as ostinati, neither of the two meters have inherent referential status, an equality that is enhanced by the metrically ambiguous melody.

[22] One reflection of Zappa's loss of interest in polymeter can be observed in the 1988 live rendition of "Oh No," wherein the passage given in Example 3.5 lacks the conflicting layer in 5/8. This version can be heard on *Make a Jazz Noise Here* (1991). Among later works to incorporate polymeter is "Tink Walks Amok" (ECE 1982), which, in some of its polymetrical textures, features the same cyclic formula evidenced in "Pound for a Brown" and "Oh No" (see *Man from Utopia* 1:27–1:35, where a 7/8 meter is coupled with 4/2 + 3/2, which has a cycle of four measures).

a lot of jazz-rock groups.[23] The next technique to be discussed, *metrical dissonance*, represents a refinement along these lines of the processes of metrical superimposition and juxtaposition witnessed thus far.

B. Metrical dissonance.

As Harald Krebs has detailed, the transference of the term "dissonance" from pitch theory into the realm of rhythm/meter has a rich history, being found in the writings of composers such as Hector Berlioz, Henry Cowell, and Charles Seeger; and theorists such as Grosvenor Cooper, Leonard Meyer, Carl Schachter, and (perhaps most influentially) Maury Yeston.[24] An advantageous notion offered by the consonance/dissonance metaphor is, as Richard Cohn notes, that "meter orients our temporal experience in ways similar to those in which tonality orients our pitch interpretations."[25] As opposed to Zappa's polymetric textures, in which both "meters" were typically of equal status, *metrical dissonance* relies on the perception of one meter as a primary metrical referent for the music. Krebs refers to this layer as the *primary metrical layer*, which is most often represented by the meter signature of a work.[26] Due to the primary metrical layer's privileged status in any given piece, the consonant framework it creates is termed the *primary consonance* of the piece. This framework is necessary for the perception of metrical dissonance.

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[23] John Dalton, "Shut Up and Play Your Guitar," *Guitar*, May/June 1979.

[24] Harald Krebs, *Fantasy Pieces: Metrical Dissonance in the Music of Robert Schumann* (New York, Oxford: Oxford University Press, 1999): 14-17.

[25] Richard Cohn, "Metric and Hypermetric Dissonance in the Menuetto of Mozart's G Minor Symphony, K. 550," *Integral* 6 (1992): 1.

[26] Ibid, 30.

Krebs's definitions of metrical consonance and dissonance are extended and adapted from Yeston's discussion of *rhythmic* consonance and dissonance (to be discussed later).[27] In Example 3.6, I have provided a hypothetical collection of layers in a metrically *consonant* relationship. This metrical state results when the cardinality produced by each pulse level (given on the example) is either a multiple or a factor of each other level.[28] Stated another way, metrical consonance ensures that any slower-moving level will always "include" all the faster-moving levels. Therefore, all attacks of the slower level will coincide with attacks of the faster levels. Situations featuring a rhythmic unit and only one slower metrical interpretation of the unit are always consonant, but collections involving at least two slower pulses are more common. For metrical *dissonance*, on the other hand, at least three levels must always be present, namely the rhythmic unit and at least two slower metrical interpretations. One metrically dissonant collection is provided in Example 3.7, now utilizing a hypothetical quarter-note rhythmic unit. The two metrical layers here, a 4-unit grouping and a 3-unit grouping, are metrically dissonant. That is, their cardinalities are not multiples or factors of one another. Krebs refers to this type of dissonance as a *grouping dissonance*, as the dissonance results from different groupings of the rhythmic unit; this particular grouping dissonance would be labeled G4/3.[29] In grouping dissonances such as Example 3.7, the attacks demarcating the two interpretive levels will be in a non-aligned relationship, a state that will be maintained until the "cycle" of the dissonance completes itself (i.e., the next point of alignment will be when the cycle begins anew). The particular G4/3 dissonance given in Example 3.7 has a cycle of twelve

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[27] The important conceptual distinctions between the theories of Yeston and Krebs will be dealt with later in this chapter.

[28] Krebs, "Some Extensions," 103.

[29] Krebs, *Fantasy Pieces*, 31; this term is adopted from Peter Kaminsky.

units ((4 X 3)/1). Krebs also defines a second category of metrical dissonance termed the *displacement dissonance*. As opposed to grouping dissonances, which result from the superposition of non-aligned layers of *different* cardinalities, displacement dissonances involve the superposition of non-aligned layers of the *same* cardinality. Example 3.8 shows a displacement dissonance resulting from two separate 2-layers (unit = eighth), the top interpretive layer displaced by one unit from the bottom layer. Following Krebs, this dissonance will be labeled D2+1, representing the displacement of the 2-layer (D2) by one unit (+1). Like grouping dissonances, displacement dissonances feature non-aligned metrical layers; however, in displacement dissonances, the layers will never become aligned. Hence, there is no cycle as such.

In Zappa's music, grouping dissonances are far more common than displacement dissonances, suggesting that he viewed metrical dissonance as an extension of his early polymetrical practices. Of the works examined for this study, only the passage given in Example 3.9, from the piece "Moggio" (ECE 1981/1983a), is consistent with the concept of displacement dissonance. This excerpt immediately follows a lengthy section of metrical consonance in which the primary metrical consonance consists of a 2-layer (unit = eighth) and a 6-layer (i.e., 3/4 meter). The sustained cadential pitch of this consonant section begins Example 3.9. At the third measure of the example, the 2-layer is displaced forward by one rhythmic unit. This displacement dissonance, D2+1, is enforced by all instruments in the texture, with the primary metrical consonance dropping out during the length of the dissonance.[30] Zappa's treatment of this dissonance demonstrates once again his concern for duple hypermeter, as the dissonance

[30] Krebs's concept of "indirect dissonance," to be discussed later in this chapter, is also applicable to this example.

persists only for two "notated" 3/4 measures before shifting to a new metrical consonance (4/4) at the fifth measure of Example 3.9.

In Example 3.10, from "The Black Page #2" (ECE 1976/1978a), we can view the issues at play in Zappa's typical approach to metrical *grouping* dissonance. As will be true for all subsequent examples, the primary metrical consonance resides in the accompaniment; here the accompanying instruments enforce the notated 4/4 meter, the drums providing a quarter-note rhythmic unit and the bass replicating a "disco-type" accompaniment every four units. The dissonant layer—as in all of Zappa's pieces—is presented by the melody, which creates a 5-layer by sustaining each successive pitch for five units, resulting in a G5/4 dissonance with the accompaniment.[31]

Example 3.10 also demonstrates Zappa exploitation of the cyclic properties of this particular grouping dissonance. As is indicated on the example, the G5/4 dissonance is maintained for two complete cycles, each 20 units in length. The beginning of the second cycle is made prominent due to its coinciding with the highest melodic pitch of the passage (B5). Further, the length of the cycle itself, lasting five notated measures, creates a higher-level G5/4 grouping dissonance with the hypermeter of the accompaniment. That is, if we posit a higher-level unit with the duration of one measure, then the accompaniment, which shifts harmony every four measures, creates a consonant 4-layer, and the alignment that occurs between melody and accompaniment every five measures (i.e., the cycle) represents a dissonant 5-layer. Rather than play out the entirety of this larger cycle, which would last twenty measures, Zappa "fills in" the two "extra" measures left after the completion of the second small-scale cycle; this allows the

[31] This is one general feature that Zappa's music shares with pop/rock music. That is, the rhythmic/metric conflict is often perpetrated by the melodic line. See examples of syncopation in David Temperley, "Syncopation in Rock: A Perceptual Perspective," *Popular Music* 18/1 (1999): 19–40.

hypermetric 4-layer, a primary consonance at the level of hypermeter, to complete itself before the cadence at the end of the passage.

"Echidna's Arf (Of You)" (ECE 1973/1974b) offers another interesting manifestation of grouping dissonance, particularly in relation to cyclic properties (see Example 3.11). Here, the primary consonance is the 5-layer of the accompaniment (unit = sixteenth). Against the established 5-layer, the melody asserts a conflicting 9-layer, which is created by successively sequencing a melody nine units in length at T2. One curious aspect of this G9/5 dissonance is that the two conflicting layers are begun out-of-phase, as the 9-layer begins three units after the 5-layer. This has important consequences for the cyclic properties of this dissonant collection, as alignment between the 9-layer and the 5-layer actually occurs *earlier* than it would have had the two layers started in phase. Specifically, alignment occurs at the beginning of the seventh measure rather than at the beginning of the tenth measure, as indicated on the example. Had the displacement not occurred, alignment between the layers would have resulted after five repetitions of the 9-layer. Interestingly, Zappa does in fact state the 9-layer exactly five times. However, when alignment does not occur after the fifth statement, due to the opening 3-unit displacement, he fills in the remaining two units of this measure with a partial sixth repetition. In sum, the five "proper" statements of the 9-layer within the cycle are sandwiched between three units at the front and two units at the end. As these "extra" units together sum to five units—the cardinality of the primary consonance—the ten-measure length of the passage is accounted for.

Both of the grouping dissonances discussed above are what Krebs calls *direct dissonances,* created from the superposition of non-aligned layers. Therefore, as stated above, they represent a refinement of the layering processes of polymeter. Another type of dissonance exploited often by Zappa is *indirect dissonance,* which results from the *juxtaposition* of metrical layers in a dissonant relationship.[32] Indirect dissonances rely on the listener's mental retention of one metrical layer as it gives way to a new opposing metrical layer. Krebs observes that "the actual duration of indirect dissonance varies from passage to passage and from listener to listener."[33] As will be seen, the retained metrical layer in Zappa's music always represents the primary consonance. Therefore, the necessity for the listener to maintain the consonant layer in the face of opposing dissonant layers is quite strong.

Within the introduction to "T'mershi Duween" (ECE 1973/1988c) (Example 3.12), indirect dissonance occurs between the first phrase (mm. 1–8) and the second phrase (mm. 9–16). The first phrase establishes the primary metrical consonance: a 5-layer utilizing a repetitive eighth/dotted eighth rhythm.[34] At a level above the 5-layer, we find duple hypermeter (i.e., 10 units), created by the sequential repetition of the first two measures repeatedly at T4. At a lower metrical level, the rhythmic unit is grouped into non-isochronous 2-3 tactus pulses. In the second phrase, however, the 5-layer is completely abandoned, as is the non-isochronous tactus; in its place is an isochronous 2-unit tactus, created by repeating or holding each new pitch for two rhythmic units. At the lower metrical level, then, we have an indirect grouping dissonance G5/2. The mental retention of the 5-layer, necessary for indirect dissonance, is made easier due to the fact that the 2-layer is not dissonant with the higher-level 10-layer of the primary consonance. As can be seen, the second phrase also features a 10-layer that is established by the repetition of its melodic idea every 10 sixteenth notes. Significantly, the 10-layer is also the

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[32] Harald Krebs, *Fantasy Pieces*, 45.

[33] Ibid., 45.

[34] This rhythm is easiest to perceive in the 1988 version of "T'mershi Duween," as heard on *Make a Jazz Noise Here*.

length of the cycle of a G5/2 dissonance. Therefore, if the two phrases were superimposed—which does occur conceptually in an indirect dissonance—four complete cycles would result, with every sequential repetition of the melody of the first phrase mapping onto the two corresponding measures from the second phrase.

A more puzzling utilization of indirect dissonance is found in the piece "Approximate" (ECE 1972/1988c), the beginning of which is provided in Example 3.13.[35] One perceptual challenge of this excerpt is that the primary consonance of the piece is not explicitly stated but exists only as the notated meter of the piece.[36] The perception of the meter relies on what is commonly referred to as *subjective rhythmization*. This refers to a listener's tendency to place a series of identical isochronous attacks within a metrical context.[37] In "Approximate," this isochronous pulse is the quarter-note tactus played throughout the piece by the drums. (Note: there is no "harmonic" accompaniment in the music, only drums accompanying a unison/octave statement of the melody). Nevertheless, in the first eight measures, very little in the *melody* suggests an interpretive layer 4-units in length. The placement of the repeated Bb is the melody in the first four measures is far too syncopated and sporadic to enforce a 4-layer. The best option for a truly perceived 4-layer appears from mm. 5–7, as each of these three measures begins with an accented pitch. Whether or not these measures sufficiently establish a 4-layer, the unambiguous 3-layer at mm. 9–11 should, at least conceptually, be experienced as an indirect

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[35] Parts of this piece are also found in "Inca Roads" (versions from 1974 onwards) and the arrangement of "The Purple Lagoon" (ECE 1976/1978a) presented on *Zappa in New York* (1978). The title "Approximate" refers to the use of indeterminacy in the piece: only select pitches are notated in the score, while all rhythms are precisely indicated.

[36] The fact that the piece is in 4/4 is confirmed in the live performance documented on *The Dub Room Special* (1982), featuring a performance of the piece from 1974. A slide shown in the movie offers a partial glimpse of the first page of the score. Further, the performance shows Zappa conducting in four throughout the piece.

[37] Justin London considers "subjective metricalization" to be a more appropriate term. London, *Hearing in Time*, 14–15.

metrical dissonance with the primary consonance. As can be seen, Zappa sustains the indirect G4/3 dissonance for exactly one cycle (3 measures); when the cycle completes, the first six measures are repeated.

"Sinister Footwear I" (ACE 1984, unreleased) features an interesting variation on the grouping-dissonance concept. The melody of the passage in question—which Zappa titles "Illegal Aliens on a Lunch Break" in the score—appears in Example 3.14. The primary consonance for this section, a 14-layer (unit = sixteenth) as indicated by the 7/8 meter signature, is established by the percussion and other accompanying instruments (not shown), which all play distinct rhythmic patterns that repeat each measure, creating a Latinesque percussion backdrop (representing, one imagines, the illegal aliens of the title). Against the primary consonance, the melody (with homorhythmic chordal accompaniment) creates what might be termed an "additive" grouping dissonance. This type of grouping dissonance features the consistent addition or subtraction of the rhythmic unit to/from each successive event. As shown in Example 3.14, Zappa begins the process with the shortest grouping of the rhythmic unit (i.e, 2) and adds one unit to each subsequent note. The augmentation of durations continues until a 14-unit duration is achieved, after which a similar process of durational diminution begins. However, the diminution process does not digress to the opening 2-unit grouping, as its goal is instead an 11-unit duration that is filled-in melodically (i.e., with each unit in its span articulated). What, one might wonder, is the logic of this process? The answer to this question is revealed by considering the goal duration of the augmentation: a 14-unit span. Significantly, this duration is identical to that of the primary consonance. The "problem" occurring at the attainment of this goal is that it is out-of-phase with the primary consonance (i.e., the notated measure). The subsequent diminution is designed, then, to correct this non-alignment and bring into phase the dissonant layer with the primary consonance. This trajectory explains why the diminution only works down to an 11-unit span, as that value is all that is necessary to achieve this goal. When alignment finally occurs, there begins a new section in the piece

II. Rhythm.

A. Distinctions between rhythm and meter.

Thus far, very little has been said regarding what is commonly called "rhythm." While the remainder of this chapter will redress this imbalance, the question remains as to how much the concept of rhythm might enrich the preceding discussion. Before discussing Zappa's trademark technique of *rhythmic dissonance*, it is necessary to consider the ways in which rhythm and meter both coincide and differ. Just where do we draw the line between these two concepts? Where does rhythm stop being rhythm and become meter, and when does a structure that is seemingly metrical function as rhythm? In this section, I will summarize the primary theoretical debates on the rhythm/meter dichotomy. Thereafter, we will witness several short passages in Zappa's music where the strict separation between rhythm and meter is deemed analytically fruitful. These examples will also provide useful tools for generally differentiating rhythmic and metrical techniques in Zappa's music, and will offer a framework for the understanding of rhythmic dissonance.

The theoretical literature on rhythm and meter offers a variety of viewpoints on the rhythm/meter dichotomy. Most of these sources assert at least some independence between rhythmic and metrical phenomena. Cooper and Meyer, for example, argue for a fairly strict separation between these two terms, whereby meter is regarded as "the measurement of pulses" and rhythm is defined as "the way in which one or more unaccented beats are grouped in relation to an accented one."[38] More recently, London defines rhythm as "patterns of duration that are phenomenally present in the music." Meter, on the other hand, is viewed as "a particular form of entrainment or attunement," functioning as "a temporal ground for the perception of rhythmic figures."[39] This view is similar to that offered by Joel Lester, who conceptualizes meter as "a grid or a structuring of time within which an object can be located on a plane surface."[40] At the opposite end of the spectrum are the theories of Krebs and Christopher Hasty. Both Hasty and Krebs advocate a more extensive merging of the two concepts. Krebs, for example, defines meter simply as "the union of all layers of motion active within a composition."[41] On the surface, this definition would seem to place meter within a realm traditionally reserved for rhythm. Even more adamantly opposed to the separation of rhythm and meter is Christopher Hasty, who seeks to capture some of the "immediacy" and "particularity" of rhythm for meter. The title of Hasty's book, *Meter as Rhythm*, indicates the degree to which Hasty views meter as an aspect of rhythm. To this end, he focuses on the processive aspect of metrical experience through the concept of "projection," which is defined as "the process in which a mensurally determinate duration provides a definitive durational potential for the beginning of an

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[38] Grosvenor Cooper and Leonard B. Meyer, *The Rhythmic Structure of Music* (Chicago: University of Chicago Press, 1960): 4–6.

[39] Justin London, *Hearing in Time*, 4, 48.

[40] Joel Lester, *The Rhythms of Tonal Music* (Carbondale and Edwardsville: Southern Illinois University Press, 1986): 52.

[41] Harald Krebs, *Fantasy Pieces*, 30.

immediately successive event."[42] Meter, then, becomes the "operation of projection at *all levels*" [i.e., pulse levels].[43]

There are advantages and disadvantages to both the conceptual separation and to the integration of rhythm and meter. The most significant drawback to the strict separation of the concepts is that it tends to obscure the degree to which rhythm can influence or give rise to meter. Even Cooper and Meyer, proponents of this model, note that the accents and unaccents of rhythm, when occurring with regularity, also often produce meter. In fact, the manner in which rhythm can give rise to meter has been essential to my discussion above, as many of the "metrical layers" produced in these examples have resulted from particular groupings or patterns of rhythms. Nevertheless, Cooper and Meyer cite examples in which rhythms can be at odds with meter, suggesting that meter can remain independent of rhythm.[44] Indeed, for the listener to maintain a meter in the face of rhythms that do not enforce the meter, there must exist a gulf between the two concepts.

How appropriate, then, is the application of the term "metrical dissonance" in regards to the examples cited above? Are these grouping and displacement dissonances truly "metrical" or are they rhythmic in nature? There are grounds to consider them both, in fact. As will be recalled, each metrical dissonance involves a "primary metrical consonance" that, significantly, is usually in accord with the meter signature. If this primary consonance is taken to represent the true meter of a work, any opposing metrical layer is perhaps best thought of as a "rhythmic" dissonance. This is the viewpoint put forth by Robert Hatten in regards to displacement

[42] Christopher Hasty, *Meter as Rhythm* (New York and Oxford: Oxford University Press, 1997): 84.

[43] Ibid, 149.

[44] Cooper and Meyer, 88.

dissonances, which he considers merely "patterned syncopations" that do not challenge the metrical hierarchy.[45] However, grouping dissonances, particularly the ones witnessed above, seem to have greater claim to the status of meter. Even London, who considers metrical dissonances to be "noncongruences between a pattern of metric entrainment [i.e., meter] and a pattern of events in the world" [i.e., rhythm], recognizes that the regularity exhibited by dissonant layers is metrical in nature, so much so that dissonant layers may threaten the existing meter.[46] That having been said, if meter is defined as a temporal ground, a grid, or a field in which rhythm operates, there can be only one reigning meter at a time. In sum, the dissonant layers of metrical dissonances can be said to manifest both rhythmic and metrical features. For the present study, however, I will retain the term, as I plan to reserve the term "rhythmic dissonance" for a separate technique that can only rightly be called rhythmic.

Example 3.15 demonstrates an important way in which we can differentiate rhythm and meter in Zappa's music. Example 3.15a provides the phrase that concludes the first section of "Approximate." This eight-measure phrase consists of four sustained pitches that are stated in irregular durations. Example 3.15a represents the duration of each pitch in reference to an eighth-note rhythmic unit, producing the pattern 22-13-13-16. Within this pattern is a repeated 13-unit duration for the second and third pitches. While such replicated durational spans are essential to meter, this particular repeated duration does not produce a truly metrical effect, as it functions instead in relation to a different metrical backdrop. Example 3.15a is better viewed as an example of rhythmic syncopation, most commonly defined as the accentuation of a weak beat (or weak part of a beat). This particular syncopation benefits from David Temperley's

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[45] Robert S. Hatten, "Review of *Fantasy Pieces* by Harald Krebs," *Music Theory Spectrum* 24/2 (2002): 276.

[46] Justin London, *Hearing in Time*, 84.

conception of syncopation as *displacement*. Temperley hypothesizes that, in syncopation, "an accent that belongs on a *particular* strong beat is shifted or displaced to a weak one."[47] Example 3.15b shows the same music of Ex. 3.15a in un-syncopated form. As can be seen, all of the four pitches appear on a strong beat and are equidistant from one another (two measures apart). This unsyncopated model shows that the syncopation only involves the two middle notes, while the first and fourth pitches appear in their "correct" placement. Therefore, these two middle pitches do not represent a separate metrical structure consisting on 13-unit durations; rather, they gain their effect in relation to an established metrical grid in which they can be located. The fact that the syncopated middle pitches both last for thirteen eighth notes may explain, from a compositional standpoint, why they appear where they do within the meter, but it does not constitute a threat to the notated meter.

We see from the previous example that the presence of a clear rhythmic unit is also essential in distinguishing rhythmic phenomena from metrical techniques in Zappa's music. Further evidence for this contention is offered by comparing Example 3.16, from "The Eric Dolphy Memorial Barbecue" (ECE 1969/1970b) with the already discussed Example 3.14 from "Sinister Footwear I." Just as "Sinister Footwear I" displayed the progressive augmentation and diminution of durations, Example 3.16 reveals a similar process of gradual diminution. This passage features a compound melody in which the lower register repeats the pitch A# while the upper part ascends chromatically from C# to G. Isolating both parts of the compound melody reveals that every successive pitch is of a shorter duration than the previous pitch. Considering the lower part (the repeated A#s), and as indicated on the example, the sequence of durations proceeds as follows: half note – dotted quarter – quarter – quarter triplet – eighth – sixteenth. However, this progressive diminution would never be termed "metrical," as its process is not

[47] David Temperley, "Syncopation in Rock: A Perceptual Perspective," *Popular Music* 18/1 (1999): 20.

strongly tied to a rhythmic unit. In fact, it is impossible to find a rhythmic unit of which each duration could be represented as an integral number.[48] Even if such a rhythmic unit could be found, the choice of this value would be largely arbitrary. In “Sinister Footwear I,” on the other hand, each successive pitch was exactly one rhythmic unit longer (or shorter) than the previous. And, more importantly, the rhythmic unit was well established by the preceding section of the piece, which consisted entirely of articulated sixteenth notes (the rhythmic unit). Therefore, the listener’s experience of that music was strongly yoked to the rhythmic unit. (Naturally, one may remain hesitant to call this a metrical process, as it does not imitate any commonly encountered meter.) In Zappa’s music, therefore, the clear presence of a rhythmic unit (or lack thereof) should be considered central to the rhythm/meter dichotomy.

An additional demonstration of the importance of the rhythmic unit to metrical experience is found in the passage from “The Black Page #1” (ECE 1976/1978a) given in Example 3.17. As can be seen, this music corresponds to that of Example 3.10 (from “The Black Page #2,” which is a recomposition of “#1.”) In the manner of Example 3.10, I have attempted to represent Example 3.17 as a G5/4 grouping dissonance. To do so, the rhythmic unit must be the sixteenth note. However, the other instruments in the texture, in both this passage and the preceding music, offer no support for sixteenth-note unit; rather, the bass articulates a pitch at the beginning of each measure and the drums provide a quarter-note tactus pulse. Without a clearly-established sixteenth-note rhythmic unit, the listener is not encouraged to be attuned to metrical groupings of the sixteenth note. Zappa’s modification of this passage in “The Black Page #2” (Ex. 3.10), therefore, finds him “correcting” these metrical deficiencies by replacing the sixteenth-note unit for a quarter-note unit that is already omnipresent in the music.

[48] Specifically, the quarter-note triplet makes this impossible.

B. Rhythmic dissonance: preliminaries.

> One of the problems of contemporary music is the *dissonance* of the harmony. That is the thing that turns off most listeners. Rhythm never really bothered people. . . . Even quarter-note (rhythms) with dissonant chords in them are not very much fun to listen to, but if you have a diatonic setting or even a bitonal setting with *complicated rhythmic stuff* on it, there's no reason why that shouldn't be appealing to a wide range of people.[49]

With the preceding discussion in mind, we now turn to the subject of *rhythmic dissonance* in Zappa's music. The hypothetical music described by Zappa in the above quotation, coupling "complicated rhythmic stuff" with a diatonic setting, could easily describe a title such as "The Black Page" (#1 and #2). But contrary to Zappa's words, rhythmic complexity is found in both his diatonic and chromatic music. The greater significance of this quote is that it indicates a transfer of the expressive duty of dissonance from harmony (or pitch) to rhythm. In the pieces to be discussed hereafter, the processes of tension and release, traditionally reserved for pitch, are employed in rhythmic phenomena. Accordingly, the term *rhythmic dissonance* will be employed: a term also used by Zappa. In this section, basic definitions and interpretations of rhythmic dissonances will be offered. Following this, we will consider how rhythmic dissonance is manifested in Zappa's works, both hybrid and non-hybrid.

Of the theoretical accounts of rhythmic dissonance, the most relevant to the present discussion from a definitional standpoint is found in Yeston's book *The Stratification of Musical Rhythm* (1976).[50] Yeston applies the term "rhythmic dissonance" when at least two rhythmic layers "cannot be expressed as a simple multiplication or division of each other."[51] Example 3.18 reproduces Yeston's Example 4.2, which shows four different rhythmic levels, labeled A

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[49] Frank Zappa, "Non-Foods: Coming to Grips with Polyrhythms," *Guitar Player Magazine*, April 1983.

[50] Maury Yeston, *The Stratification of Musical Rhythm* (New Haven: Yale University Press, 1976).

[51] Ibid, 78.

through D. Some of these levels are consonant with each other, such as D and C (4:2 ratio) and D and B (6:2). Others, such as C and B (3:2), are dissonant, and level A forms a dissonance with all other levels (7:2, 7:4, 7:6). Krebs has fruitfully characterized Yeston's conception of rhythmic dissonance as "arithmetic" in that it is seemingly dependent on the relationship held between the integers that represent the various rhythmic layers.[52] In contrast, Krebs's sees his own conception of consonance and dissonance as being "geometrical," based on the degree of alignment between metrical layers. This geometric focus is, in part, the impetus behind Krebs's use of the term "metrical" dissonance as opposed to Yeston's "rhythmic" dissonance.

One demonstration of these conceptual differences is apparent in consideration of the common "hemiola" between 3/4 and 6/8 meters. Example 3.19 provides two separate realizations of this hemiola; at (a) is a manifestation that seems to support a "geometrical" sense of non-alignment while at (b) is one for which Yeston's arithmetic view is better suited. For Example 3.19a, both rhythmic strata articulate the rhythmic unit (eighth note); the upper line supports a metrical interpretation of groupings of two while the lower line groups the unit into a dissonant 3-layer. These dissonant layers create the type of horizontal non-alignment between metrical groupings with which we are already familiar. In Example 3.19b, neither of the two strata articulates a shared rhythmic unit (a point to be returned to later). Instead, the measure features two different isochronous pulses. The quarter-note pulse level sounds three times in the measure while the dotted-quarter pulse is articulated twice, producing a dissonant 3:2 ratio. Beyond the opening articulation, these two levels share no attacks. While one may choose to view either of the two realizations in Example 3.19 from the opposing vantage point, doing so

[52] Krebs, "Some Extensions . . .," 101.

would represent a very different type of "hearing" in both cases.[53] My goal is to refocus attention on the "arithmetic" type of dissonance that, as conceptualized by Yeston, has received comparatively little attention. Hereafter, the term "rhythmic dissonance" will denote this phenomenon. In many ways, this is a conception of rhythmic dissonance that is in search of a repertoire in which it can hold significance.

Rhythmic dissonances share several fundamental properties that distinguish them from metrical dissonances. While metrical dissonance requires a pulse level (the rhythmic unit) and at least two metrical interpretations of this pulse, rhythmic dissonance entails (1) a given time span in which the dissonance occurs and (2) at least two different pulse rates (hereafter IOI = interonset interval) that subdivide the time span into equal units. After Yeston, the different IOIs are considered dissonant if the numbers of attacks they separately produce within the time span are not simple multiplications of divisions of one another. Example 3.20 provides four paired IOIs that share this dissonant relation, each subdividing a different time span. I will refer to the aforementioned duration as the *length* (abbreviated "L") of the dissonance.[54] L will always be measured with regard to the number of tactus pulses that elapse within a dissonant collection. Example 3.20 assumes a quarter-note tactus (which, not coincidentally, is the most common tactus in Zappa's rhythmically dissonant music). In Example 3.20, therefore, the L of (a) is 1, (b) is 2, and so forth.

As defined here, rhythmic dissonances are more or less identical to phenomena traditionally called "polyrhythms": a term also used occasionally by Zappa. London, for

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[53] Subsequent work on metrical dissonance has expanded upon Krebs's geometric model, even including discussions of metrical dissonance at the level of hypermeter. For example, see Richard Cohn, "Metric and Hypermetric Dissonance in the Menuetto of Mozart's G Minor Symphony, K. 550," *Integral* 6 (1992): 14–33.

[54] The concept of "length" is taken from Richard Cohn 1992. Cohn, however, deals with metrical dissonances, and measures the length of a given passage by the number of rhythmic units that transpire.

example, defines a polyrhythm as "any two or more separate rhythmic streams in the musical texture whose periodicities are noninteger multiples"—which is precisely Yeston's definition of rhythmic dissonance.[55] Despite the synonymous nature of the terms, rhythmic dissonance will be used instead of polyrhythm for various reasons. First, "polyrhythm" is inherently vague, meaning simply "many rhythms." Second, the "dissonance" metaphor is better suited to describe this phenomenon, particularly as employed in Zappa's music. That is, the term "rhythmic dissonance" conveys the both expressive potential of these rhythms and their musical function.[56] Consider, for example, the following comment from Zappa:

> What I would describe as a dissonant rhythm is 23:24, where things would *rub up against each other* in the same way that notes a half-step apart have a certain tendency to *twinge your ears*.[57]

Essentially, the dissonant effect results from the lack of shared rhythmic attacks within a given dissonance, as can be seen in the rhythmic dissonances of Example 3.20.[58]

An additional reason why "rhythmic dissonance" is a more satisfactory term is that, as already implied by Example 3.19, rhythmic dissonances can be represented as lower-level grouping dissonances. Indeed, Zappa himself showed awareness of this fact. When asked in an interview to demonstrate a "five-over-three" rhythm, Zappa explained (apparently over the phone) as follows:

> Well, draw 15 dots on a piece of paper. Draw stems coming up from every fifth one on the top, and stems coming down from every third one on the bottom, and you'll see the effect of five over three.[59]

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[55] London, *Hearing in Time*, 49.

[56] For example, when London discusses the two-against-three hemiola (Ex. 3.21b), he observes that the dotted-quarter pulse "is heard as a rhythmic grouping that *chafes* against the ongoing triple meter." London, *Hearing in Time*, 49.

[57] David Mead, "Unholy Mother—Frank Zappa," *Guitarist Magazine*, June 1993.

[58] Some rhythmic dissonances, such as 9:6, need to be reduced further (to 3:2 in this case) to have no shared attacks. In Zappa's music, these dissonances are not employed.

[59] Frank Zappa, "Non-Foods: Coming to Grips with Polyrhythms," *Guitar Player,* April 1983.

Example 3.21a reproduces the interviewer's (or magazine editor's) attempt at following these directions. As can be seen, Zappa's directions are followed a bit too literally, as no stem is drawn on the first dot, where both an up- and down-stem should reside.[60] Example 3.21b provides a correct realization; as seen, those stems drawn at every fifth dot produce the 3-layer, while those stems drawn every three dots create the 5-layer. The interesting revelation of this exchange is that it finds Zappa explaining a rhythmic dissonance in a way consistent with Krebs's grouping dissonances (i.e., in reference to a rhythmic unit). It is possible to explain any rhythmic dissonance in this way. Given a rhythmic dissonance (A:B), the number of rhythmic units that transpire will be equal to (A x B). One pulse of the A-layer will be equal to B-number of units while one pulse of the B-layer will be equal to A-number of units. For example, in a 7:6 dissonance, 42 units (7 x 6) will transpire; the 7-layer's attacks will occur every 6 units and the 6-layer's attacks will be articulated every 7 units.

This having been said, there are several problems with conceptualizing rhythmic dissonances in the manner of grouping dissonances. Foremost, such minute relationships within a given L often surpass the perceptual capabilities of listeners. Imagine, for example, the 7:6 rhythmic dissonance mentioned above in the context of 3/4 meter (i.e., comprising one measure of 3/4). Because 42 rhythmic units would have to elapse within this span, the unit in question would, unless residing within a slow tempo, have an extremely rapid IOI (a 32nd-note septuplet). Further, because the rhythmic unit is not expressly articulated, it must be imagined by the listener without prompting. While true metrical dissonances are heard as conflicting *metrical interpretations* of pulses (units), rhythmic dissonances are heard instead as conflicting *subdivisions* of a certain time span. Indeed, an important aspect defining rhythmic dissonances

[60] The rhythm that results from this error is the retrograde of the correct realization.

as "rhythmic" is that they are not subject to a rhythmic unit. As Zappa explained, "any piece of time can be subdivided any old way you like. And that's what happens when people talk, because people don't talk in 4/4 or 3/4 or 2/4—they talk *all over the place*" (i.e. at different IOIs).[61]

C. Rhythmic dissonance in the hybrid music.

Having now defined rhythmic dissonance in the abstract, we begin to investigate the ways in which this phenomenon appears contextually in Zappa's music. Rhythmic dissonance is most commonly found in Zappa's "hybrid" music (see discussion in Chapter 2). While later in this chapter I will demonstrate some applications of rhythmic dissonance in non-hybrid music, the vast majority of the passages that I will discuss tend towards the hybrid style. The employment of rhythmic dissonance in these titles is often so extensive as to constitute a kind of "premise" for the music, as movements into and out of rhythmic dissonance define the listening experience. One finds a high degree of consistency in Zappa's employment of rhythmic dissonance in the hybrids, so much so that the hybrid style and this technique should be considered strongly linked.[62]

In this section, several topics regarding rhythmic dissonance in the hybrids will be addressed. First, we will consider the unique problems encountered in interpreting rhythmic

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[61] Frank Zappa, "Absolutely Frank: First Steps in Odd Meters," *Guitar Player Magazine*, November 1982.

[62] Rhythmic dissonance is lacking in very few hybrid works within the repertoire I am examining. Most of the hybrid-style pieces that lack rhythmic dissonance are found among Zappa's early Synclavier pieces on albums such as *Frank Zappa Meets the Mothers of Prevention* (1985) and *Jazz From Hell* (1986). For example the pieces "Night School," "The Beltway Bandits," and "G-Spot Tornado" on *Jazz From Hell* all feature extensive, improvisatory sections, but almost no significant rhythmic dissonance. This fact probably stems from the manner in which Zappa entered the melodies of these pieces. Most likely, they were improvised on the Synclavier keyboard (i.e., not on the guitar). See Robert L. Doerschuk and Jim Aikin, "Jazz From Hell," *Keyboard*, February 1987; Jeff Spurrier, "Zappa on Jazz From Hell," *Music & Sound Output*, March 1987.

dissonances as defined thus far in such contexts. This discussion will foreground a comparison of “The Black Page #1” and “#2” that will confirm several of the theoretical suppositions made there. Following this analysis, I will summarize the various types of rhythmic dissonances found in simple meters in the hybrid titles under investigation. Finally, contextual issues arising from the juxtaposition of rhythmic dissonances in the hybrids will be examined, including *indirect rhythmic dissonance* and *dissonance resolution*.

1. Theoretical interpretation.

Hybrid pieces are well-suited for rhythmic dissonance by virtue of their *metrical* stability and their implied separation between rhythmic and metrical events in the musical texture. As mentioned in Chapter 2, fixed meters are the norm in the hybrid style. In Zappa’s music, the instrumental layer supplied with the task of enforcing the meter is always the accompaniment (usually bass, drums, and keyboard—though drums at the very least.) This layer will hereafter be referred to as the *metrical layer*. This term is not intended to imply that the sounding events of the metrical layer are not rhythmic, only that these events are clearly *metered*; therefore, the term can be translated “the layer whose pulses are associated with the meter and its enforcement.” Conversely, those events certainly heard as rhythmic are found in the melody. This layer will thereby be termed the *rhythmic layer*. As will be shown, rhythmic dissonance in the hybrids functions according to the relationship held between the rhythmic layer and the metrical layer.

Example 3.22, a single measure from “The Black Page #1” (ECE 1976/1978a), serves as a case in point for the problems of interpretation that arise in many hybrid passages. Here, the content of the metrical layer is extremely sparse, consisting only of a quarter-note tactus in the drums and a single sustained pitch occurring at the beginning of each notated measure in the bass: the minimum enforcement for 4/4 meter. The IOI of the tactus is a slow 60 BPM (beats per minute); perhaps as a result of the slow tempo, there is little or no sense of hypermeter in the piece. Henceforth, this type of metrical framework will be termed a "slow-tactus meter," a type also found in two additional early hybrid titles, "Be-Bop Tango" (ECE 1972/1974b) and "Manx Needs Women" (ECE 1976/1978a), as well as the later "Mo 'N' Herb's Vacation I" (ECE/ACE 1978/1983c).[63] In the measure given, the overall rhythmic activity between the rhythmic layer and the metrical layer could scarcely be more differentiated; while the tactus sounds four times, the melody articulates 30 times. Comparison of the two layers shows the metrical layer to be what London calls *metrically underdetermined*.[64] Only two pulse levels (quarter and whole) are articulated, and both have slow IOIs. The heavy rhythmic activity of the rhythmic layer conjures up faster IOIs, but these are never explicitly stated in the metrical layer. As Zappa explains: "I think that the real interest of what to do with rhythm is to have people's feet tapping to a *normal beat* [i.e., the tactus], and then superimpose interesting things against that steady beat."[65]

Relating to our definition of rhythmic dissonance, the slow tactus of the passage causes certain complications, as none of the rhythmic groupings in the rhythmic layer have an L greater than 1. In fact, some of the rhythms, such as the triplet and quintuplet, only have an L of 1/2. The result of this fact is that none of these rhythms are in a dissonant relationship with the tactus, as there are no non-coinciding attacks between the melody and accompaniment. In what sense,

[63] For "Be-Bop Tango," this IOI holds for early versions of the piece (when it was part of a larger piece entitle "Farther O'Blivion" and the final version of the piece, as heard on *The Yellow Shark* (1993). For the performance on *Roxy and Elsewhere* (1974), the pulse is quickened significantly to 120 BPM (emphasizing the "Be-Bop" segment of the title at the expense of the "Tango").

[64] London, *Hearing in Time*, 56.

[65] John Dalton, "Shut Up and Play Your Guitar," *Guitar*, May-June 1979.

then, are we to hear some of these rhythms as dissonant? To answer, let us focus first on the L=1 septuplets that sound towards the end of the measure. While these septuplet subdivisions may not be dissonant with the *sounding events* of the music, they still function as dissonances in relation to the tactus. However, this dissonance relates to *subtactus* levels; that is, the septuplets prevent the slow tactus from receiving any consonant metrical support from faster pulse levels in the *metrical layer*. Because seven is a prime number, any other subdivision of the tactus concurrently sounding during this span would create a rhythmic dissonance.[66] But what would be the normative subdivision of the tactus?

London hypothesizes that "hearing a beat requires at least the potential of hearing a subdivision."[67] Given the slow IOI of the tactus here (and in similar pieces), the tendency to hear a subdivision is even greater. Perceptual studies by Richard Parncutt have shown that pulse salience is strongest with IOIs close to 100 BPM.[68] This finding would lead one to conclude that the slow tactus (60 BPM) of "The Black Page #1" is relatively lacking in salience (i.e., the ability to accurately clap or dance to the beat.) However, a simple binary subdivision of this tactus lies extremely close to the IOI for *maximal pulse salience* (being 120 BPM). If, as Zappa states, the intention is for the listener to tap along with the tactus, it can be assumed that most listeners will, at the very least, supply an implied eighth-note pulse to the metrical layer. It is this eighth-note pulse that will be rhythmically dissonant with the L=1 subdivisions in the rhythmic layer. In the case of Example 3.22, the ratios will be 7:2. As for the L=1/2 subdivisions on beat two of the

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[66] All rhythmic dissonances will include at least one level that is prime. Maury Yeston discusses the issue of prime versus non-prime dissonant structures. Yeston, *The Stratification of Musical Rhythm*, 122–128.

[67] Justin London, *Hearing in Time*, 34–35.

[68] Richard Parncutt, "A perceptual model of pulse salience and metrical accent in musical rhythms," *Musical Perception* 11 (1994): 409–464.

measure, these require an implied sixteenth-note pulse to create “vertical” rhythmic dissonances.[69]

While the process described above might seem convoluted, it is actually quite simple. It requires foremost that the listener hear the accompaniment (the meter) as a separate entity from the melody (the rhythm). In essence, the metrical layer exists outside of the piece itself. It represents our generic, and inherently uninteresting, metrical expectations for a piece “in 4/4,” including completely consonant pulse levels. When a slow tactus is presented, the listener will provide *at least one* level of binary subdivision to the metrical layer in order to increase the pulse salience of the tactus, thereby improving the listener’s accuracy at foot-tapping, clapping, or dancing. These implied levels *thicken* the consonance of the meter, turning a metrically underdetermined surface into a richer collection of consonant pulse levels. Because this framework is so strongly suggested, Zappa often allows the tactus itself to drop out during rhythmically dissonant melodic phrases:

> You know that it [the tactus] is there. Even though the musician isn’t playing the four beats, your foot is tapping in the basic time signature of the song. And there is a clock inside your body that’s saying, “We’re in 4/4.” And someone plays nine across it, and inside your body you hear the difference and that’s part of the excitement of that kind of rhythm.[70]

Another important factor for the implied pulses of the metrical layer is that their IOIs are generally closer to those presented in the rhythmic layer. This allows any dissonant rhythms of the rhythmic layer to be heard as either “too fast” or “too slow” in relation to the consonant

[69] In all of the pieces discussed in this section, duple subdivisions are considered normative. Of course, triple subdivision *could* be established as the norm in the piece, but this would require an established triple grouping at the outset of the piece. A good example of normative triple subdivision in the metrical layer is the piece “The Grand Wazoo,” which utilizes a shuffle accompaniment. Therefore, when L=1 dissonances occur therein, they are heard as dissonant with the triple subdivision.

[70] Frank Zappa, “Coming to Grips with Polymeters,” *Guitar Player*, April 1983.

implied levels, and thereby dissonant. Zappa likens the pulses of the metrical layer to "natural rhythms":

> There are certain *natural rhythms*. . . . What is your heartbeat rate? That's a rhythm. . . . There is also an average tempo at which people conduct their lives. That is a rhythm. If that average didn't exist, then people wouldn't know whether or not they were going fast or slow because those [pulses] are terms which are *used to compare* to an average.[71]

This consideration often plays a role in Zappa's notation of dissonant rhythms, particularly when they are represented as ratios such as 13:12, as seen in Example 3.23 from "Sinister Footwear 2" (ECE/ACE 1981/1984b). Here, the IOI of the L=3 subdivision (of 13) is heard as slightly too fast compared to the consonant sixteenth-note "implied" pulse.

Let us return to the previously discussed measure of "The Black Page #1," but now with reference to our fuller understanding of the metrical layer of the piece. Example 3.24 superimposes the rhythmic layer of this measure above three pulse levels of the metrical layer, which are organized hierarchically from the levels most-likely to be implied by the listener (sixteenth-note and eighth-note) to the sounding tactus. For each rhythmic grouping in the rhythmic layer, the pulse levels of the metrical layer with which it is dissonant are boxed in. As indicated on the example, beat 1 is consonant, beat 2 includes two separate dissonances with the sixteenth-note level, and the septuplets of beats 3 and 4 are dissonant with both of the "implied" levels.

The visual representation of Example 3.24 suggests that, considered in isolation, the longer the L of the dissonance, the greater the dissonance, as longer L subdivisions will naturally be dissonant with more pulses of the metrical layer.[72] In this measure, then, the rhythmic

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[71] Bob Marshall, "Interview with Frank Zappa," October 22, 1988.

[72] Harald Krebs's makes a similar contention in relation to metrical dissonances: "One factor that determines the inherent intensity of grouping dissonances is length of cycle; the more pulses that elapse before attacks of the constituent layers coincide, the more intense the dissonance." Harald Krebs, *Fantasy Pieces*, 57. Since each rhythmic dissonance is, in the abstract, a complete cycle, these two rules are very much the same.

dissonances seem arranged to produce a gradual increase in the dissonant intensity of the rhythms. Nevertheless, none of these rhythms are highly dissonant in their own right, as none are dissonant with the tactus. The rhythm of Example 3.23, on the other hand, is dissonant with all potential pulses of the metrical layer, including the tactus (3:13 ratio). Generally, tactus-level dissonance is the furthest level of rhythmic dissonance in Zappa's music. Beyond the tactus, it becomes a matter of *how many* tactus pulses are included in the collection that provides criteria for further ranking, whereby L=2 subdivisions are less intense than L=3 subdivisions, and so on.[73] However, these rankings are not absolute between pieces, as tempo effects the degree to which, for example, one L=2 dissonance compares with an L=2 dissonance from a different piece. Therefore, it is not notational length that is absolute, but the real-time length.

2. "The Black Page" #1 and #2.

With our greater understanding of the tools necessary for interpreting rhythmic dissonance in the hybrids, a thorough comparison will now be made between the "two" pieces "The Black Page #1," and "The Black Page #2." This discussion will detail the types of dissonances found and the manner in which they are employed. As will be shown, these differences reveal a keen understanding of the issues discussed above on the part of Zappa.

In "The Black Page #1, the dissonances shown earlier in Example 3.22 are typical. That is, most are either L=1/2 or L=1 subdivisions. Of dissonances with an L=1/2, subdivisions of 3 and 5 are found, whereas the L=1 dissonances include 5, 7, and 11 subdivisions. As was mentioned above, this is significant in that none of these rhythms are dissonant with the tactus.

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[73] Besides ranking dissonances according to their L, one could also posit a hierarchy of dissonances within the same L. This would likely be done by considering dissonances with faster IOIs as more dissonant, as faster IOIs open up the possibility for the listener to intuit extra "implied" levels in the metrical layer. However, there seems to be little analytical usefulness for this extra level of hierarchy.

This L=1 limit seems to be fairly consistent for other rhythmically dissonant works from this time period, particularly in the pieces "Be-Bop Tango" and "Manx Needs Women," which, as mentioned above, are also in the slow-tactus category. On the opposite end of the spectrum, one finds rhythms such as those shown in Example 3.25 a-b. These appear to be "nested" rhythmic dissonances, wherein a larger subdivision is subdivided into smaller rhythmic groupings.[74] Zappa was apparently proud of these nested dissonances; in an interview, he was even able to recall the exact measure number in which the most extreme of these occurs (Ex. 3.25b):

> So I think you're referring to bar 15 of "The Black Page." And that's a tricky bar to play. But it *can* be played and it has been played over and over again by a lot of different musicians in and out of the band . . . So, to count that particular measure, you divide the bar into a half-note triplet. That's the big bracket. And inside each of the half-note triplet beats, there are further subdivisions. That's all.[75]

The large subdivision of a nested dissonance represents, in actuality, a change in tempo. In both Example 3.25 a and b, the tactus is quickened by a 3:2 dissonant ratio. Since the tactus is already slow, this part of the rhythm is the most difficult to perform. Both in terms of length and complexity, these nested dissonances are the most intense in the piece (by the criteria stated above). As complete entities, however, they are difficult to integrate with the other rhythmic dissonances of the piece, as they do not feature a single IOI across their L. As we will see, the performance and perceptual challenges of the nested dissonances must have become apparent to Zappa by the time he decided to rework the piece.

"The Black Page #2," essentially an isomelic variation of "#1," can be seen as a refinement, both in terms of rhythm and meter, of the earlier-composed piece. It also exploits even better the subversive potential of rhythmic dissonance. One novel feature of "#2" is that, in

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[74] James Borders, in his study of "The Black Page," calls these rhythms *second-generation complexities*. James Borders, "Frank Zappa's 'The Black Page': A Case of Musical 'Conceptual Continuity'," in *Expression in Pop-Rock Music*, ed. Walter Everett, 137-155 (New York: Garland, 2000).

[75] Frank Zappa, "Absolutely Frank: First Steps in Odd Meters," *Guitar Player*, November 1982.

its first incarnation, it superimposes a modified version of the melody of "#1" on a disco-style accompaniment.[76] Significantly, Zappa's cited disco music as a prime example of rhythmic *consonance*, where "everything is boom, boom, boom," "banging you over the head and reinforcing your factory rhythm [i.e., the consonant pulses of the metrical layer]."[77] We have already discussed how rhythmic dissonance can be employed in order to weaken the salience of the tactus pulse, either by cutting off consonance beneath the tactus or by creating rhythmic dissonances with the tactus. For "The Black Page #2," Zappa conceived of audience-participation activities whereby his audience members could experience first-hand this intended effect. Specifically, he would request the audience to dance or clap along to the music—apparently a difficult feat for many. At a concert in Berlin in 1978, Zappa relieved the audience of this duty but asked instead that they "meditate about all those poor folks that clap their hands to this song, because they never get all the way through. They just can't do it!"[78]

Some of the most significant modifications in "#2" are made to the metrical layer. Most importantly, there exists a higher degree of pulse salience. The previously slow tactus of "#1" (60 BPM) is quickened to twice that, with an IOI of 120 BPM. Now, the tactus lies very close to Parncutt's stated range for maximal pulse salience. Zappa (mockingly) acknowledged 120 BPM as an optimal dance tempo: "Americans . . . find it absolutely UNPOSSIBLE [sic] during their precious off-duty hours to dance to any song unless its in 4/4 at 120 beats per minute—no

[76] The piece was premiered at the same concert as "1" as well as the drum solo version in which the piece began. These can all be heard on the album *Zappa in New York* (1978). The disco accompaniment was utilized from 1976–1978. During the 1981–1982 tours, a reggae accompaniment was substituted, while later versions utilized ska (1984) and new age (1988).

[77] Bob Marshall, "Interview with Frank Zappa," October 22, 1988; David Mead, "Unholy Mother—Frank Zappa," *Guitarist Magazine*, June 1993.

[78] Frank Zappa, Berlin, February 15, 1978. Transcription by the author.

fuckin' around now—no 119—no 121—gimme the ol' 120 'n turn up the goddam handclaps!"[79] Given the quicker tactus, Zappa also attempts, where possible, to create 4-bar hypermeter.[80] This is observed most clearly in the music corresponding to mm. 1–8 and 19–23 of "#1." Whereas previously this music had consisted of alternating Gsus2 and Bbsus2 chords, each chord lasting one measure, in "#2" each chord persists for four measures, creating a type of hypermeter more normative for the disco setting. Contributing to the tactus pulse salience of the metrical layer is a greater degree of sub-tactus consonance. The rhythm of the bass accompaniment, played consistently throughout the piece, is shown in Example 3.26; it explicitly articulates both eighth-note and sixteenth-note pulse levels. Therefore, in contradistinction to "#1," the listener is not given the responsibility of mentally providing sub-tactus levels to create consonant reinforcement of the tactus. In sum, the metrical layer of "#2" is no longer underdetermined.

"The Black Page #2" also finds various modifications made to the melody of "#1," most of which have consequences for the types of dissonances involved. The first of these is the elimination of all the nested dissonances of "#1." (In fact, after "The Black Page #2," no nested dissonances are found in Zappa's composed music until the late 1980s/early 1990s, when he apparently began experimenting with them on the Synclavier (where accuracy of performance could be assured).[81]) As for other melodic events in the rhythmic layer, most rhythms of "#1" are augmented "notationally" by either a 4:1 or 2:1 ratio in "#2." Considering the rhythmic dissonances of "#1," the employment of either of these two augmentation ratios will alter the length of the dissonance. To demonstrate, let us return to the measure analyzed above from "#1"

[79] Frank Zappa and Peter Occhiogrosso, *The Real Frank Zappa Book* (New York, NY: Touchstone, 1999): 160.

[80] As stated earlier, the quicker the tempo, the more likely that levels of meter will exist above the notated measure.

[81] More will be said on this point later in the chapter. Nested dissonances do appear in Steve Vai's transcription of Zappa's solos in *The Frank Zappa Guitar Book*.

(Example 3.22); the corresponding music of “#2” is provided in Example 3.27. As the example indicates, the rhythms of the first two measures of this phrase are in a 4:1 ratio with those of the original melody, while the last measure is in a 2:1 ratio. The interesting result of these expansions is that the dissonant rhythms, which were all previously of L=1/2 or L=1 lengths, are now uniformly L=2 dissonances. Therefore, they are all now dissonant *with* the quarter-note tactus. It should be observed, however, that those rhythms expanded by a 2:1 “notational” ratio are actually in a 1:1 “sounding” ratio (i.e., sharing identical IOIs) with those of “#1.” This occurs because, as was noted above, the tactus in “#2” has an IOI at 120 BPM, twice that of the tactus of “#1.” Hence, the quarter-note pulse in “#2” has an equivalent IOI to the notated eighth note of “#1.” More significant, then, is the expansion of certain rhythms by a 4:1 “notational” ratio, which causes the previous L=1/2 dissonances to likewise create dissonances *with* the tactus. Regarding Zappa’s audience-participation activity, any L=2 dissonance will involve the clapper/dancer performing rhythms dissonant with the attacks of the rhythmic layer (e.g. 2:3, 2:5, 2:7). In “#1,” on the other hand, the clapper never had to clap *against* dissonant rhythms (with the exception of the nested dissonant structures), as all dissonant subdivisions were located at the sub-tactus level.

The concern for creating rhythmic dissonances with the tactus is, with very few exceptions, observed for the remainder of “The Black Page #2.” This tendency is especially prevalent towards the end of the piece. Example 3.28 provides the melody of the final four measures of “#1” (Ex. 3.28a) alongside the corresponding measures of “#2” (Ex. 3.28b). In the first of the two phrases, all rhythmic groupings in “#1,” regardless of their L, become L=2 dissonances in “#2.” Specifically, the L=1/2 subdivisions, found on beats 1 and 2 of “#1,” are expanded by a 4:1 ratio to become L=2; all L=1 dissonances of “#1,” namely the subdivisions of eleven on beats 3 and 4, are expanded by a 2:1 ratio to likewise become L=2 dissonances. This process even extends to the triplet on beat 1 of measure 28 of "#1": already an L=2 dissonance. As can be seen, the "notational" ratio relating the triplet rhythm between "#1" and "#2" is 1:1. However, with the quicker tactus of "#2," the triplet actually *sounds* twice as fast. The final phrase of "#1" (mm. 29–30) presents a slightly more complicated process of recomposition. First, the nested-dissonance on beats 1 and 2 are eliminated; then, with the exception of the first quintuplet (which is recomposed), the smaller subdivisions in the nested structure are set as L=2 dissonances. Only at the final measures of "#2" does Zappa break from the pattern of L=2 subdivisions, wherein the L=1 subdivisions of eleven on beat 3 and 4 of m. 28 are expanded by a 4:1 ratio, creating measure-long (L=4) rhythmic dissonances (i.e., 11:4 ratios). Because these rhythms have the longest Ls of the piece, and are thereby experienced as the most intense, a greater sense of drive towards the cadence of the piece is achieved. "#1," by contrast, seems to end abruptly.

3. Rhythmic dissonances in simple meters.

In hybrid music featuring rhythmic dissonance, simple meters are most commonly employed—in particular the meters 3/4 and 4/4.[82] These meters share much in common, including the same tactus value (the quarter note) and, depending on tempo, usually the same sub-tactus implied pulses as mentioned in relation to "The Black Page." Accordingly, they share many of the same potential rhythmic dissonances. Figure 3.1 provides a survey of the various rhythmic dissonances (not including the nested dissonances of "The Black Page #1") found in

[82]Later in Zappa's career, he made attempts to employ rhythmic dissonance in non-isochronous meters. The unreleased piece "Sinister Footwear I," for example, includes hybrid sections in 5/8 and and 7/8. The lack of subsequent hybrid works in non-isochronous meters suggests that Zappa found these experiments unsatisfactory. As we have seen, the presence on an isochronous tactus is crucial in the experience of rhythmic dissonance. Also, later works such as "Outrage at Valdez" utilize compound meters in the hybrid style.

the meters 4/4 (Fig. 3.1a) and 3/4 (Fig. 3.1b) of the hybrid titles under study here. 4/4 pieces surveyed include the works "The Black Page #1 and #2," "Be-Bop Tango," "Manx Needs Women," and "Mo 'N' Herb's Vacation 1"; pieces in 3/4 include "Sinister Footwear II," "Alien Orifice" (ECE 1981/1985) (post-solo), "Pedro's Dowry" (ACE 1976/1979c), and "The Perfect Stranger" (ACE 1984a). Each listing provides both the possible Ls as well as the dissonant subdivisions found within these Ls.

The highest L for both of these simple meters is equivalent to the length of the measure itself. Therefore, no rhythmic dissonances will ever extend beyond the notated barline, including those with shorter Ls. (Also implicit is that rhythmic dissonances either begin on a beat or, if L=1/2, on the offbeat.) That said, measure-long rhythmic dissonances are much more common in triple meter. In fact, the only L=4 dissonance listed (11) is found in the faster tactus piece "The Black Page #2." Therefore, it seems that L=2 is the practical limit for rhythmic dissonances in slow-tactus pieces in 4/4. The ubiquity of L=3 dissonances in 3/4 meter is similarly explained in reference to tempo; the triple meter pieces listed above all feature a quarter-note tactus at approximately 80 BPM. In real time duration, L=3 dissonances will last 2.25 seconds, only marginally longer than L=2 dissonances in the slow-tactus pieces in 4/4 and the L=4 dissonances in faster-tactus pieces, both of which will last 2 seconds. Hence, the three-second mark represents a general barrier for individual rhythmic dissonances in the hybrid style. At the lower limit, L=1/2 forms the smallest length for a rhythmic dissonance. This limit is due to the fact that, at all these tempi, the sixteenth-note pulse represents the shortest likely implied pulse level in the metrical layer, and is therefore not subject to further subdivision. All other Ls in both 4/4 and 3/4 meters are a certain number of quarter notes in length.[83] Triple meter has the

[83] Only in one triple meter piece ("The Perfect Stranger") does one find dissonances with an L=1 ½ . These are explained as change in tactus from the quarter-note to the dotted quarter, familiar from the 3/4-6/8 hemiola.

greatest range of quarter-note Ls, moving uniformly upwards in length from L=1 to L=3. Zappa exploits this property in the passage from "Pedro's Dowry" (ACE 1975/1979c) shown in Example 3.29. Here, a seven-note melodic idea is presented three times in succession throughout mm. 59–62. The first presentation of the melody is an L=1 subdivision of seven, while the second and third presentations, as isomelic variations, expand the dissonance progressively from L=2 to L=3.

The length of the L greatly affects the variety of dissonant subdivisions occurring therein. L=1/2 dissonances are the most limited, consisting of only triple and quintuple subdivisions. Due to tempo considerations, the longer the L, the more potential subdivisions exist; this also explains why L=1 and L=2 subdivisions in slow-tactus pieces in 4/4 are more numerous than those in the faster-tactus 3/4 pieces. L=3 dissonances permit more non-prime subdivisions, since the tactus rhythm subdividing the measure itself is a prime number greater than 2; this allows non-prime subdivisions such as 8 and 10 (3:8 and 3:10 dissonant ratios with the tactus).

Also included on Figure 3.1a are several theoretically "problematic" non-prime subdivisions (in bold at the bottom of each column). These subdivisions are distinguished from most, as they are dissonant with fewer pulse levels of the metrical layer than the remainder of those under the same list. For example, under L=1 one finds subdivisions of non-prime integers 6 and 10. Unlike the remaining L=1 subdivisions, which are dissonant with both the eighth-note and sixteenth-note pulses of the metrical layer, these two non-prime subdivisions are only be dissonant with the sixteenth-note level (6:4 and 10:4 ratios). One potential solution is to view them as concatenated L=1/2 dissonances wherein, for example, the sextuplet subdivision is broken into two triple L=1/2 rhythms and the subdivision of ten is broken into two L=1/2 quintuplets. If, on the other hand, we decide to follow Zappa's notation of these rhythms as L=1 subdivisions, at the very least they should be ranked as less intense than the remaining L=1 dissonances.

An additional factor that may affect the status of these non-prime subdivisions is *internal grouping*: the small-scale metrical grouping of the pulses of a dissonant subdivision. A somewhat idiosyncratic example is shown in Example 3.30, from the non-hybrid "Alien Orifice" (ECE 1981/1985).[84] Here we find an L=4 subdivision of non-prime integer 12. The IOI of this rhythm is equivalent to an eighth-note triplet: a rhythm that is not dissonant with the tactus (i.e., no non-coinciding attacks). As can be seen, however, Zappa beams the pulses of this rhythm into non-equivalent groups in a 3-4-2-3 pattern. The perceptibility of Zappa's beaming is debatable; an easier interpretation of the pulses to hear is 4-4-4 (or 2-2-2-2-2-2), as all repeated notes will reside in the same group. Both of these groupings would produce dissonances with a slower pulse created by the groupings (3:4 or 6:4). (Without accepting Zappa's beaming or my alternate readings, it can be agreed that there is no support for a fully consonant 3-3-3-3 grouping of these pulses.) Similarly, "Mo 'N' Herb's Vacation I" (ECE/ACE 1978/1983c) contains a variety of L=1 and L=2 subdivisions of the non-prime integer 10, some of which are given in Example 3.31. As can be seen, Zappa beams none of these subdivisions of 10 into a 5-5 grouping, which would reduce the dissonance of the rhythm by one level. For example, in the first L=1 subdivision of 10 (Ex. 3.31a), a 5-5 structure is implied by the melody, with the two groups of five being transpositionally-related at T9. However, the 5-5 structure is shifted forward by one pulse, thwarting the potential for rhythmic consonance with the eighth-note level. In Example 3.31b, both rhythms are beamed into non-isochronous 4-6 groupings. As in "Alien Orifice," the degree to which the listener perceives Zappa's beaming is questionable. This

[84] This dissonance was not included on Figure 3.1a, as the section in which this dissonance occurs is not in the hybrid style.

tendency does indicate, however, that Zappa was aware that these non-prime rhythms are, inherently, not as dissonant as the primes, thereby requiring some intervening level of meter or grouping to manifest a similar dissonant status to other prime rhythms within their L.

4. Indirect dissonance.

The preceding discussion has dealt with rhythmic dissonances almost solely from a "vertical" standpoint, treating them as "direct dissonances" that result from the superposition of pulses from the rhythmic layer onto those of the metrical layer. However, dissonant rhythms most often occur in the context of a variety of rhythmic events, some of which are likewise dissonant and some of which are not. Consider the two adjacent phrases from "Be-Bop Tango" (ECE/ACE 1972/1974b), given in Example 3.32. As is characteristic of this piece, both phrases focus almost exclusively on L=1 dissonances, including subdivisions of 3, 5, 6, and 7. The most salient aspect of these passages, however, is the manner of rhythmic juxtaposition. Krebs's concept of "indirect dissonance," discussed earlier, accounts for dissonances created by juxtaposition rather than by superposition. As opposed to direct dissonance, which is vertical and arithmetic, indirect dissonance is horizontal; it describes the listeners experience as one collection of pulse layers gives way to another.

Though much of Krebs's discussion of indirect dissonance is applicable here, there are important differences between *metrical* indirect dissonance (as dealt with by Krebs) and indirect dissonance that is *rhythmic*. Metrical indirect dissonance relies on (1) the firm establishment of a certain metrical state and (2) the listener's mental retention of that state once it is abandoned and replaced by a new collection of metrical layers. In the context of rhythmic dissonance, one layer, namely the metrical layer, is always constant, while juxtaposition occurs in the rhythmic layer.

Yet, the effect of indirect rhythmic dissonance is less reliant on the listener's mental retention of a particular rhythmic subdivision. Given the inherent distinctions between rhythm and meter, it is less necessary for any rhythm to become an *established* referent for other rhythmic activity. More fundamental to rhythmic indirect dissonance are shifts in IOI in the rhythmic layer. In Example 3.32, nearly every beat heralds an IOI shift, each of which represents an indirect dissonance. This process also allows for the participation of consonant rhythms; in Example 3.32, for instance, all rhythms are dissonant, yet the sextuplet is, by itself, a less dissonant L=1 subdivision (especially given its 3-3 internal grouping). In the first phrase of the example, this sextuplet represents an intermediary IOI between the quintuplet and the septuplet. Because all rhythms involved have very close IOIs, indirect dissonance is subtly felt, with IOIs moving faster, then slower, then faster again. Zappa described the experience as follows: "What it amounts to is retards and accelerandos inside the bar, mathematically worked out so that instead of bomp, bomp, bomp bomp—four beats in a bar—you get other kinds of action, where the *time* inside the bar goes faster, goes slower, and goes faster again."[85]

In sum, indirect rhythmic dissonance in Zappa's music represents the complete refusal to settle on a single IOI in the rhythmic layer. This factor permits an even greater conceptual stratification between the metrical layer and the rhythmic layer. That is, as opposed to the isochronous pulses of the metrical layer, the various rhythms that make up the rhythmic layer do not share a common rhythmic unit, rendering them ill-equipped for a maintained metrical interpretation (i.e., because meter requires at the very least the presence of a single isochronous pulse).

[85] Frank Zappa, "Absolutely Frank: First Steps in Odd Meters," *Guitar Player*, November 1982. This quote is not in reference to "Be-Bop Tango" but to the more general process found in hybrid pieces.

The listener's experience of the IOI shifts of the rhythmic layer are aided by the omnipresent, regulatory isochronous tactus pulse in the metrical layer, as all shifts will occur at the beginning of a beat (or occasionally on the offbeat, if L=1/2). Zappa understood well the importance of the tactus pulse, stating that "polyrhythms are interesting only in relation to a steady, metronomic beat (implied or actual) – otherwise, you're wallowing in *rubato*."[86] That is, without a tactus referent, IOI shifts might be heard as the employment of expressive rubato by the performers. For this reason, the tactus is almost always phenomenally present in Zappa's rhythmically dissonant music. This is largely true of his ACE works as well, even though it produces textures that might seem stylistically idiosyncratic at times. Jonathan W. Bernard observes that "Zappa's ACE music can seem *rudderless* when the need [i.e., the pulse] is not somehow supplied."[87] Indeed, without the sounding tactus, no isochrony (or rudder) would be present on the musical surface.

The stratification between the metrical layer and the rhythmic layer associated with indirect dissonance was realized most memorably in an audience-participation activity Zappa created for "Be-Bop Tango" circa 1973, one example of which can be heard on *Roxy and Elsewhere* (1974). Essentially, this exercise was the opposite of that employed for "The Black Page #2." Rather than having the audience clap or dance to the "beat" (tactus), they were asked to dance along to the melody (i.e., the rhythmic layer), which was played (and sung

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[86] Frank Zappa and Peter Occhiogrosso, *The Real Frank Zappa Book* (New York, NY: Touchstone, 1999): 180-181. Art Jarvinen, who worked as a copyist for Zappa, remembers performing, in preparation for a concert, "The Black Page" as well as "Manx Needs Women" for Zappa at his home in the early 1980s. At the time, the pieces were being performed as unaccompanied melodies. According to Jarvinen, "Frank said 'all those polyrhythms don't mean anything unless they're in reference to something.' So he suggested we use a drum machine or drum set, to give the melodic line rhythmic meaning." See http://members.cox.net/bill-lantz/pages/ocker.html.

[87] Jonathan W. Bernard, "Listening to Zappa," *Contemporary Music Review* 18/4 (2000): 92.

simultaneously) by keyboardist George Duke.[88] In Zappa's words: "There's a beat going on like *this*. That's a *pedestrian* beat. You don't dance to that beat, you dance to what George sings . . . the little quick ones."[89] The apparent objective of this pursuit was to elicit a unique type of spastic, twitching bodily movement from the dancer in reaction to the IOI shifts. Not surprisingly, Zappa had little success in getting his audience members to obey his instructions, as it requires a very foreign approach from traditional beat-oriented dancing.[90]

In passages such as those given in Example 3.32, the accumulation of indirect dissonances contributes significantly to the overall dissonant impact of a given phrase. However, because shifts in IOI are so common therein, none of the individual indirect dissonances are especially intense. Example 3.33, the end of instrumental break from the song "Montana" (ECE 1972/1973), demonstrates how indirect dissonance can be intensified by allowing a particular IOI to become momentarily referential.[91] Here, a mildly dissonant L=1 sextuplet gains privileged perceptual status. For most of this section, the sextuplet is the primary dissonance employed, and becomes established as a referent IOI. In the final two measures of the example, contrary IOIs are introduced, each exploiting the potential to intensify indirect dissonance. The penultimate measure represents a special case; here, the IOI value does not change but rather does the internal grouping of the sextuplet, which shifts from 3-3 to 2-2-2. This grouping also increases the inherent dissonance of the sextuplet. This event acts as a transition towards the indirect rhythmic dissonance that occurs at the final measure, wherein the slower IOI

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[88] The activity occurs after the theme proper of "Be-Bop Tango." The melodies sung by George Duke, though, are all based on the phrases of the theme. Therefore, all the melodic features cited above apply.

[89] Frank Zappa, "Be-Bop Tango," *Roxy and Elsewhere* RCD 10520.

[90] See in particular a performance in Waterloo, Canada, November 18, 1973.

[91] This section was also performed with a text applied to the melodic line; it is commonly referred to as the "tiny horse" section.

of the L=1 quintuplet occurs. Because the IOI of the sextuplet is so well established in the preceding music, this otherwise subtle change in IOI creates a particularly jarring indirect dissonance to close the section.

"Sinister Footwear II" (ECE/ACE 1977/1984b) similarly exploits the greater intensity of indirect dissonance that results from establishing a referent IOI, but here in the service of expanding the process of indirect dissonance to non-adjacent events. Example 3.34 provides the four phrases that comprise the pre-solo section of the piece. As in "Montana," there are few indirect dissonances in these phrases (at least when compared to pieces like "Be-Bop Tango," "The Black Page," and "Mo 'N' Herb's Vacation I.") In the first phrase, an indirect dissonance occurs at the juncture of the first two measures. Once the new IOI is set into motion—an L=1 quintuplet—it is allowed to proceed undisturbed by indirect dissonance for four complete beats. From this point forward, all contrary IOIs are experienced as indirect dissonances in relation to this quintuplet. Furthering the referential status of the quintuplet are similarly long streams of that same rhythm to end both the second and third phrases. Each of these phrases likewise contains an indirect dissonance preceding the quintuplets. These similarities aid the transference of indirect dissonance to non-adjacent events. In comparing the first and second phrases, for example, the sextuplet of phrase two can be heard to substitute directly for the quintuplet holding a corresponding metrical placement in the first phrase (measure 2, beat 1). This relationship is strengthened by the fact that the first three pitches of the second phrase (B A C) are the retrograde of those beginning the first phrase (C A B).

There are also motivic relations that exist among the phrases, and these permit further associations between the referential quintuplet IOI and non-adjacent rhythms with contrasting IOIs. The primary motive of this section is established at the last quintuplet of the first phrase, characterized by repeated notes at the second and third positions in the quintuplet. This motive is further refined in the second phrase by the addition of a <-,+,-> contour to the quintuplets. As indicated on the example, the aforementioned motive is stated in varied form in many of the remaining rhythmic dissonances of the phrases. In phrase 2, for example, a retrograde version of the motive is found embedded in the sextuplet; in the third phrase, two adjacent repetitions of the motive are located in the L=3 dissonance, while the quintuplets of this phrase invert the motive; in phase 4, a more registrally open version of the motive is embedded within the L=2 septuplet. Even the L=3 subdivision of 10 of this phrase 4 hints at the motive, as it features a retrograde-symmetrical internal grouping of 3-2-2-3, with the final five articulations closely resembling the motive, save for its semitone interval (C#-C) in place of the repeated note.[92] These motivic/contour relations permit the listener to hear indirect dissonances between rhythms that are not directly juxtaposed.

5. Dissonance resolution.

Transferring the term "dissonance" from pitch theory to describe rhythmic phenomena carries the potential for further parallels, namely that of dissonance *resolution*. Krebs observes that any succession from a metrically dissonant state to a consonant state could be termed a "resolution" of sorts.[93] When considering Zappa's rhythmic dissonance practices, however, this view of resolution is not entirely workable. One problem is demonstrated in Example 3.36, a phrase from "Mo 'N' Herb's Vacation I" (ECE/ACE 1978/1983c). Here, two L=1 subdivisions of 9 sandwich a consonant quadruplet. Does this consonant rhythm constitute a resolution? The

[92] The first five notes of this rhythm are more difficult to relate to the motive. However, in relation to the second five notes, they seem to represent a mixture of retrograde and inversion operations.

[93] Harald Krebs, "Some Extensions," 114.

answer is no for several reasons, the first being the presence indirect dissonance in the phrase. Therefore, while one process of dissonance is inactive (the vertical), the other—in which the quadruplet partakes as it begins and ends—is still active (the horizontal). The second reason why the quadruplet does not represent a resolution is that rhythmic consonance is the purview of the metrical layer of hybrid music. Therefore, resolution can truly only occur when the rhythmic layer concludes its activity, as shown on the example. Once the rhythmic layer has ceased challenging the salience or creating dissonances with the pulses in the metrical layer, the pre-existing state of consonance is free to reemerge. Apparent then is that individual rhythmic dissonances need not necessarily resolve. Rather, it is common for the accumulation of rhythmic dissonances, along with the resultant indirect dissonances, to resolve as a totality.

In most pieces containing rhythmic dissonance, the dissonance-to-consonance succession is cyclical in nature, with each collection of dissonances giving way to a consonant resolution and each resolution foregrounding a subsequent collection of rhythmic dissonances. Referring explicitly to rhythmic dissonance, Zappa describes the process as being akin to "having an itch and getting to scratch it. . . . The most interesting music as far as I'm concerned is music in which dissonance is created, sustained for the proper amount of time, and resolved and got your scratch [sic], and [then on to the] next case."[94] Generally, each of these cyclical units is heard as a musical phrase. Yet the rhythmic layer is not itself entirely responsible for phrase articulation; in Example 3.34 (from "Sinister Footwear II"), for example, regular four-bar hypermeter serves foremost to delineate phrase boundaries, while the dissonance-resolution process is worked out within these boundaries.[95] In pieces without clear hypermeter, such as "The Black Page #1" and

[94] Bob Marshall, "Interview with Frank Zappa," October 22, 1988.

[95] Since Zappa's music does not feature harmonic cadences, phrases cannot be delineated by cadences as they are in classical tonal music.

“Mo ‘N’ Herb’s Vacation I,” the dissonance-resolution progression takes on a greater role in phrase articulation. The traditional gesture of resolution in Zappa’s hybrid music is a sustained pitch in the melody (in fact, it is so common that it is something of a cliché). As a general rule, the sustained pitch should last for at least two complete beats to serve as a resolution. Any shorter length does not allow the listener to regain the full metrical framework of the metrical layer.

One demonstration of the importance of the sustained pitch in achieving resolution is found in consideration of “The Black Page #1.” Here we return to an issue regarding form left unresolved in Chapter 2. As mentioned therein, the rhythmic content of the piece has a simple A-A` form (each section 15 measures in length), with the first eleven measures of each section being rhythmically identical. However, at m. 16, the point of rhythmic return, Zappa chooses not to repeat the music from m. 1 forward, opting instead for a melody related via contour retention to the opening. Only at m. 19 does a true recapitulation of music from the A section begin. Example 3.36 reproduces the melody from mm. 15–19, indicating both the rhythmic return (m. 16) and the tonal return (m. 19). A comparison of the music preceding each of the returns reveals stark differences that offer evidence as to why Zappa delays the recapitulation until m. 19. The rhythmic return is preceded by the most intense dissonance of the entire piece (the infamous m. 15). The tonal return, on the other hand, is preceded by a sustained pitch lasting three complete tactus pulses: the longest sustained pitch of the piece. Therefore, the tonal return is foregrounded by a strong sense of resolution. Conversely, the moment of rhythmic return is not preceded by resolution, nor does it resolve the dissonance of m. 15. (True, m. 16 is a rhythmically consonant measure, but, as explained above, consonance in the rhythmic layer does not by itself resolve rhythmic dissonance.) Had Zappa wished to achieve recapitulation at measure 16, he would have needed to interpolate a measure of resolution between measures 15 and 16: one ending with a customary sustained pitch at least two tactus pulses in length. Instead, Zappa chose to incorporate the music from mm. 16–18 into the preceding phrase, thereby altering the symmetrical 15 + 15 measure formal structure of the original drum solo.

D. Rhythmic dissonance in non-hybrid music.

Having now examined rhythmic dissonance in its most common context, let us turn to manifestations of this technique in the non-hybrid music. Because dissonant rhythms are less likely to be found in this context, their inclusion carries the potential for even greater disruption, or even (if intended) a humorous effect. A prime example of the latter is "Dancin' Fool" (1977/1979a), a (non-instrumental) song that pokes fun at the disco craze of the 1970s. The narrative of "Dancin' Fool" follows the exploits of an over-the-hill disco patron who, though desperate to partake of the disco lifestyle, is unable to "keep a beat" while dancing. At the midpoint of the song, after Zappa's intonation of the words "the beat goes on and I'm so *wrong*," the band superimposes an L=7 (!) rhythmic dissonance over a disco vamp (see Example 3.37).[96] Significantly, the melody being played at this moment is a quotation from the hybrid piece "Manx Needs Women" (1976/1978a). In its original form, this melody was an extremely fast L=1 dissonance (see Chapter 2, Example 2.12); in "Dancin' Fool" it is slowed to an IOI close to that of to the eighth-notes articulated by the disco vamp. Specifically, the IOI of the 13:14 rhythm is just fractionally "too slow" to match the eighth notes of the vamp. Clearly, this rhythmic dissonance depicts the faulty movements of the protagonist.

[96] These comments do not refer to the original recording of the song as heard on *Sheik Yerbouti* (1979) but rather to a later stage version from 1982, as heard on *You Can't Do That On Stage Anymore* Vol. 5 (1992).

A similarly humorous superimposed rhythmic dissonance is found in "T'mershi Duween" (ECE 1973/1988c). As observed earlier in this chapter, "T'mershi Duween" articulates a clear sixteenth-note rhythmic unit which, as shown in Example 3.12, participated in the indirect metrical dissonance of the introduction. This rhythmic unit is also central to the main theme of the piece (Example 3.38a), which utilizes shifting meters, relying on the sixteenth-note rhythmic unit to guide the listener through the unpredictability of the metrical shifts. As a result of these shifts, the segment of the theme shown in Example 3.38a, which is repeated twice subsequently, comprises a total of 23 sixteenth notes: a prime number. Later in the piece, when the main theme is set to be reprised, Zappa interpolates a new bass accompaniment preceding the main theme's entrance (see first four measures of Example 3.38b). This new accompaniment contrasts with the main theme in its employment of a fixed meter of 2/4. Achieving an interlock between these two contradicting metrical frameworks, the main theme is presented as a superimposed rhythmic dissonance over the new accompaniment. The substantial length of the dissonance, 6, permits the melodic restatement to have an IOI close to that of the referential sixteenth-note rhythmic unit from the original statement of the theme. Though hearing the 23:24 ratio between the IOIs of these thematic presentations is certainly beyond the perceptual capabilities of most listeners, the careful listener should recognize that the sixteenth-notes of Ex. 3.38b are just slightly slower than those of the first presentation.[97] As in "Dancin' Fool," the musical effect of this rhythmic dissonance has an almost absurd quality, as it forces a melody containing a prime number of rhythmic units (23) into a metrical framework in which a non-prime number (24) is expected.

[97] As the reader might remember, Zappa's example of a dissonant rhythm was 23:24, hence we can only assume that he was referring to the passage in question. See David Mead, "Unholy Mother—Frank Zappa," *Guitarist Magazine,* June 1993. Todd Yvega, assistant to Zappa, remembers that, during rehearsals in 1991 for "The Yellow Shark" concerts, "T'mershi Duween" was presented to the Ensemble Modern in order to "see how (they) would handle the difficult 23 against 24 tuplets." Liner notes to *Everything Is Healing Nicely*, UMRK CD 03, 1999.

A particularly disruptive context for rhythmic dissonance can be created by placing it within an unfamiliar rhythmic and metrical environment. Such a situation is witnessed in the following two titles to be discussed. Consider, for example, the theme of the non-hybrid "Inca Roads" (ECE 1973/1975a). Example 3.39 provides the final measures of the first part of the theme, the "link," and the beginning of the second part (see discussion in Chapter 2). As can be seen, only the link utilizes rhythmic dissonance. However, rhythmic dissonance is not the only technique that distinguishes the link from the two main parts of the theme, as the sections that sandwich the link are in many ways its polar opposite rhythmically and metrically. Both sections employ a perpetual-motion texture in which the rhythmic unit (sixteenth note) is constantly articulated. This texture insures that the shifts in IOI of the link are particularly jarring. As for meter, the two main parts of the theme utilize shifting meters and non-isochronous meters, both of which are aspects at odds with the fixed isochronous meters common to rhythmically dissonant music. As the annotations on the example indicate, the succession of meters at the end of part 1 are organized to gradually transition towards the metrical framework typical of the hybrids. First, the succession from 5/8 to 7/8 entails a move from a 2-3 grouping of the rhythmic unit to a 2-2-3 arrangement. Finally the 2-2-3 pattern of 7/8 meter gives way to the isochronous 2-2-2-2 of 2/4 meter, which completes the process. Once 2/4 meter is achieved, all familiar pulse levels of the metrical layer in the hybrids are in place, including a quarter-note tactus as well as eighth-note and sixteenth-note pulse levels.

The song "Zombie Woof" (1973) employs its only rhythmic dissonance in a similar context as "Inca Roads." The introduction to the song is shown in Example 3.40; here, an eighth-note rhythmic unit is activated at the outset, placed within non-isochronous shifting meters. Like "Inca Roads," a gradual process unfolds in which the initial triplet grouping of the rhythmic unit becomes 2-3 at m. 5 and then finally 2-2-2-2 at m. 7: a metrical framework in which the rhythmic dissonance of mm. 8–10 can function regularly. This rhythmic dissonance also has a significant role in the song as a whole. In the first presentation, the IOI of the L=2 quintuplets are in a 5:4 dissonant ratio with the eighth-note rhythmic unit. Later in the song, this same idea is presented, first in prograde and then in retrograde, *with* the eighth-note rhythmic unit (Example 3.41). Here, therefore, it is no longer a rhythmic dissonance but rather an "indirect" metrical dissonance with the prevailing 4/4 meter of the piece. Additionally, this presentation of a previously rhythmically dissonant idea with the IOI of the rhythmic unit has the effect of transferring the tactus to a slower pulse value. As indicated in Example 3.41, the eighth-note unit is less prevalent in this section; in its place is the slower quarter-note pulse persisting in the bass. The tactus for this section becomes the half-note, as opposed to the quarter-note tactus of all the preceding music. This shift is thereby precipitated by slowing the IOI of the rhythmic dissonance of m. 7 to that of the rhythmic unit.

As a final example that elaborates upon many of the concepts explored in this chapter, I would like to consider a larger span of music in which rhythmic dissonance interacts with a more fundamental metrical dissonance. This analysis will demonstrate the potential for a higher-level employment of metrical/rhythmic conflict. Example 3.42 provides the bulk of the post-guitar solo section of "Alien Orifice" (ECE 1981/1985). As can be seen, the three sub-sections indicated on the example emerge from certain generic metrical attributes. Specifically, sections 1 and 3 are in the fixed meters of 3/4 and 2/4, respectively, while section 2 is characterized by shifting meters. Beyond these metrical descriptions, there are important rhythmic details that distinguish the sub-sections. Let us begin with a general description of the contents of each section.

Of the three sections, only section 1 utilizes rhythmic dissonance. These dissonances are confined almost exclusively to the even-numbered measures. Conversely, the odd-numbered measures are largely consonant, though, given their lack of a sustained pitch, they do not necessarily resolve the dissonances of the even-numbered measures. The most important shared element of the odd-numbered measures is a particular referent IOI: the inherently consonant sixteenth-note pulse. This referent pulse is found first on beat 3 of m. 1 and thereafter comprises at least one full beat on all of the odd-numbered measures. Significantly, this IOI is the fastest of the entire section. At the final measure of section 1, this pulse is finally permitted to saturate an entire measure.

Turning to section 2, the referent IOI continues to dominate the texture. Here, however, this now-established rhythmic unit is placed within a pseudo-perpetual motion texture that occasionally rests on sustained pitches. As rhythmic dissonance is no longer found, section 2 features instead indirect metrical dissonance. This indirect metrical dissonance is manifest not only in the shifting meters, but it is also felt in relation to the fixed 3/4 meter of section 1. This occurs because all of the meters utilized during the perpetual motion of section 2 are incompatible with the quarter-note tactus of section 1. Therefore, this referent tactus is de-activated for most of section 2. Importantly, the tactus reemerges at each sustained pitch of section 2, as does the 3/4 meter associated with the section 1. The sustained pitches in the 3/4 measures function analogously to the rhythmic resolutions common to rhythmically dissonant music, only here they resolve *metrical* dissonances. In sum, section 2 both confirms the primacy of the 3/4 meter of section 1 while at the same time challenges it by incorporating shifting meters in a dissonant relation with its tactus.

In section 3, all dissonance activity—both rhythmic and metric—is eradicated. An uninterrupted perpetual motion of sixteenth notes dominates, as does a new fixed meter of 2/4. This new meter allows also for the quarter-note tactus of section 1 to proceed again unchallenged. The succession of rhythmic/metrical states of the passage as a whole becomes, then, one of rhythmic dissonance (section 1) followed by metrical dissonance (section 2) followed by rhythmic and metrical consonance.

Besides viewing the three sections described above as distinct in their treatment of rhythm/meter, we can also see them as strongly interrelated. To do so, we must resolve the largest gulf in the passage as a whole, namely the large-scale indirect dissonance that exists between the two "fixed" meters of the music: the 3/4 meter of section 1 and the 2/4 meter of section 3. Sections 1 and 3 actually share a common rhythmic feature. Specifically, each measure of these two sections consists of precisely eight rhythmic articulations per measure.[98] Within these constraints on rhythmic attacks per measure, the duple meter of section 3 is in a symbiotic relationship with the referent sixteenth-note pulse; the rhythm may proceed without interruption and maintain its ideal, almost mechanistic consonant state with the tactus. In section 1, the triple meter allows for no such relationship, as the sixteenth-note pulse must be interrupted in some fashion in every measure in order to continue the pattern of eight articulations per measure. Some of these interruptions, as already stated, are in the form of rhythmic dissonances. The L=3 dissonances of measure 2 and 6, for example, attempt to emulate the steady IOIs of section 3, finding an alternate slower pulse that will enable a single IOI to saturate an entire measure (within the eight articulations to a measure constraint). In fact, section 1 could easily be recomposed to look precisely like section 3; all that would be necessary is to change the meter to

[98] The final measure of section 1, which contains more than eight articulations, acts as a bridge between sections 1 and 2.

2/4 and realize every pitch as a sixteenth note. As indicated, Zappa highlights this fact by stating mm. 1–2 of section 1 as an isomelic variation at mm. 28–29 of section 3. In sum, section 3 proves the triple meter of section 1 to be at odds with its melodic material, and perhaps not such a primary meter after all.[99]

E. Influences and precursors.

Having now detailed Zappa's methods, we end this chapter with a consideration of the potential influences that may have contributed to Zappa's interest in rhythmic dissonance. The most logical repertoire to investigate would seem to be the works of certain twentieth-century classical composers. In this category, potential compositional models can be found in the works of Varèse, Stockhausen, Boulez, and Carter. Zappa's familiarity with the works of these composers varies; but given comments throughout his career, it can be assumed that he had at least a passing knowledge of works from all of these composers, and had probably viewed select scores during his brief period in junior college. To different degrees, rhythmic dissonances are commonplace in these composers' music. It is questionable, however, as to whether the term "dissonance" applies to their works in the same way as it does to Zappa's music. That is, by "rhythmic dissonance" here I refer only to the use of rhythms with various IOIs, thereby resulting in music that at least "looks" similar to Zappa's melodies. Of these composers, Stockhausen and Carter exploit rhythmic dissonance to the greatest degree, while Varèse and Boulez do so to a lesser extent.

Somewhat surprisingly, Zappa never cited any of these composers as influences for his rhythmic-dissonance practices. Though one could perhaps claim that Zappa's silence was an

[99] Following this logic, we might view the metrical disorder of section 2 as a first step in the overthrow of 3/4 meter, even though that meter is continually reasserted therein.

attempt to conceal his true sources, closer inspection reveals important differences between Zappa's techniques and those of the above-named composers. Most fundamental is the lack of a "beat framework" in their works. In writing of Varèse, Jonathan W. Bernard notes a "penchant for rhythmic complexity (that) seems to have been aimed at nearly complete and constant disruption of pulse, of any semblance of regularity in beat pattern. . . . It is difficult to find passages in Varèse where the beat, or even some simple subdivision or compound of it, is literally stressed for more than a couple of measures."[100] The same is true, maybe to a greater degree, of the Stockhausen and Carter examples, as they employ what Elizabeth West Marvin terms "nonbeat-based rhythms," or rhythms not controlled by a single rhythmic unit.[101] We have already seen that the same "non-beat based rhythms" constitute the rhythmic layer of Zappa's rhythmically dissonant music. However, we have also observed that the metrical layer in this music provides a constant IOI (the tactus), holding the rhythmic irregularities together. Zappa's rhythmic dissonances also disrupt the pulse, but only in the sense described above in reference to "The Black Page #1 and #2," in which dissonant rhythms affect pulse salience. These differences aside, it is still quite possible that the general rhythmic language of Varèse, Stockhausen, Carter, etc. influenced Zappa's melodic writing in the rhythmic layer. If so, his true innovation was placing these rhythms within a beat/metrical framework, one which importantly allows them to function as true "dissonances" with the pulses of a consonant metrical layer and also lays the framework for processes of tension and resolution.

As the reader has likely already concluded, given the discussion in Chapter 2, Zappa's improvisational style was also key to the development of his interest in rhythmic dissonance

[100] Jonathan W. Bernard, *The Music of Edgard Varèse* (New Haven and London: Yale University Press, 1987), 133.

[101] Elizabeth West Marvin, "The Perception of Rhythm in Non-Tonal Music: Rhythmic Contours in the Music of Edgard Varèse," *Music Theory Spectrum* 13/1 (1991), 64.

techniques. The ubiquity of rhythmic dissonance in hybrid music bears this point out, as works featuring the hybrid style manifest Zappa's interest in transferring his improvisational tendencies to his compositions. In fact, many of the quotations from Zappa provided throughout this chapter were intended to apply freely to both his composed and improvised output, revealing the concepts to be largely merged in his mind. For example, consider Zappa's description of his improvising methods: a portrayal that could just as easily characterize the various composed hybrid works observed throughout this chapter:

> A lot of times I'll play 13 notes over a half note and try to space it evenly so it flows. . . . I don't think in little groups of twos and fours and stuff—they just don't come out that way. I can sit around and play fives and sevens all day long with no sweat.[102]

When Zappa began having his solos transcribed, his preference seems to have been for them to be notated in such a way as to emphasize their similarities to the hybrid titles.[103] At the same time, he recognized that some of the complex rhythms found in *The Frank Zappa Guitar Book* may have been the result of "rushing the tempo, or trying to catch up with a band that was running amok."[104] While stating that "the notational results sometimes appear to be a little terrifying," he insisted that "the rhythms be (performed) accurately," and that only "wrong notes" could be altered.[105]

The essential features of the metrical layer in Zappa's rhythmically dissonant music—the use of fixed meters and the consistent tactus pulse—also take their cue from his solos. Of course, this description fits nearly all rock/pop improvisation, so it cannot be said to be original

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[102] Steve Rosen, "One Size Fits All Interview," *Guitar Player*, January 1977.

[103] Zappa's copyist David Ocker claims that "the transcriptions were a lot more complicated than they needed to be – especially if they were intended to be used for anyone to play from. Often I would find places where Steve (Vai)'s notation could be reduced to something simpler, but Frank would always resolve the differences in favor of the most complicated notation. http://members.com/net/bill_lantz/pages/ocker.html.

[104] Frank Zappa, *The Frank Zappa Guitar Book* (Hal Leonard, 1982), 302.

[105] Ibid.

to Zappa. In fact, the relationship between the metrical layer and the rhythms of the improvised or composed melody apparently had, for Zappa, a precedent in the solos of his favorite blues-guitarist Johnny "Guitar" Watson (1935–96). One of Watson's solos in particular, that of "Three Hours Past Midnight" (1956), impressed Zappa for "the absolute maniac way that he spewed out these notes in a phrase with little or no regard to the rest of the meter or what was going on, but still being aware of where the beat was. He was just yellin' at you."[106] The formative influence of Johnny Guitar Watson, along with the classical models discussed above, constitute the raw material that Zappa ultimately synthesized in his own music. In sum, it can probably be safely concluded that rhythmic dissonances as vertical entities were brought to the attention of Zappa by Varèse, Stockhausen, etc., while his actual compositional usage took its model from outside the modernist-classical canon. Therefore, Zappa's particular use of rhythmic dissonance represents his most significant solution (as to rhythm/meter) in attempting to merge his classical and popular music influences.

Finally, Zappa's use of rhythmic dissonance reflects his interest in pushing the boundaries of human performance:

> If you're going to write for human beings, you have to know what they can and what they can't do. And then you have the option of pushing it a little bit, writing something that is just slightly more difficult then you would imagine a human being was capable of doing. If you lucky, you'll find people who can rise to that occasion, and I've been lucky enough to find certain musicians in the last twenty five years who managed to play some things that other people would think impossible. But they never would have done it if somebody hadn't thought up this impossibility and not only asked them to do it but paid them to do it."[107]

We have already witnessed examples of "un-performable" rhythms, such as the "nested dissonances" of "The Black Page #1" (particularly m. 15). Once Zappa began composing for the Synclavier, rhythms of comparable complexity began to reappear. Example 3.43 offers two

[106] Bill Milkowski, "Frank Zappa: Guitar Player," *Down Beat*, February 1983.

[107] Charles Murray, "Jazz From Hell," BBC Radio 3 Documentary, 2003. The influence of Conlon Narcarrow may have also been a consideration of this aspect of Zappa's rhythmic language.

representative rhythms found in the late-period hybrid works "Outrage at Valdez" (SYN/ACE 1990/1993b) and "Get Whitey" (ACE 1992/1993b), both of which were originally composed on the Synclavier (but premiering in ACE performance on *The Yellow Shark* (1993)). Both of these examples consist of measure-long dissonant ratios, wherein smaller groupings reside. That is, like the nested dissonances observed earlier, no single IOI comprises the entire rhythm.[108] The actual musical effect is, somewhat ironically, *more* improvisatory than that of the rhythms we have previously encountered, coming closer in fact to the sound of Zappa's solos.[109] However, because there is little of the Synclavier music available in score, it is difficult to come to any sound conclusions about his late-period employment of rhythmic dissonance, other than to note that human performance was apparently no longer a concern. Zappa's own comments suggest that the Synclavier allowed his imagination to run wild. In interviews circa 1986–93, he would frequently boast of the rhythms he was using, such as "88 notes in the space of three quarter notes."[110] When asked what effect these rhythms produce, Zappa responded, "It makes me want to dance!"[111]

[108] To the best of my ability to judge, the performers of the Ensemble Modern merely approximate these rhythms.

[109] This may be due to the fact that, like Zappa's solos, many of the complex notated rhythms are the result of changes in tempo in the rhythmic layer.

[110] Joe Morgenstern, *LA Times Magazine*, October 30, 1988. See also Doerschuck 1987 and Forte 1986.

[111] Ibid.

CHAPTER IV

DIATONIC MUSIC

I. Introduction: Zappa and common-practice tonality.

> There are so many people who are dashing away from diatonic music in order to give the appearance of being modern—which I think is a waste of time.[1]

Although we have established the presence of several different approaches to pitch in Zappa's instrumental output, most of his best-known titles are essentially diatonic. Bernard applies the term "tonal" to much of this music, but only in response to its fundamental diatonicism and "strongly articulated pitch centers."[2] In fact, reconciling Zappa's diatonicism with familiar theories of functional tonality is fraught with difficulties. Perhaps, then, we can situate this repertoire alongside other post-tonal music that utilizes the diatonic scale towards non-functional ends (e.g., music by Stravinsky, Copland, etc.). Indeed, this chapter will demonstrate the degree to which Zappa's approach to diatonicism is separate from the tonal tradition in both concept and practice. That having been stated, Zappa clearly did not view his diatonic music as being among the post-tonal diatonic canon. Instead, the primary characteristics of his diatonic music should be seen as arising in part as a protest against the tonal tradition. Therefore, before proceeding with the theoretical work of this chapter, we must first consider how Zappa understood and characterized tonal music, both from classical and (more importantly) popular repertoires.

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[1] Frank Zappa, as quoted by Tim Schneckloth, "Garni Du Jour, Lizard King Poetry and Slim," *Downbeat Magazine*, May 1978.

[2] Jonathan W. Bernard, "Listening to Zappa," *Contemporary Music Review* 18/4 (2000): 88.

Relative to Zappa's development as a composer, the influence of the tonal tradition was felt most strongly during his early adulthood. This was the period of time in which Zappa was in search of an approach to pitch organization, following the failures of his early experiments. As discussed in Chapter 2, his first significant exposure to tonal concepts came from his brief formal training in music theory. Though his rejection of this education had important consequences (see Chapter 2), it is not likely that the *music* of the common-practice tonal period factored much into his knowledge of tonal principles, given his professed lack of familiarity with the repertoire. Rather, the harmony textbooks he had encountered were singled out for scorn, due to their "embodiment of those evils [i.e., rule-based voice leading, etc.], in catalog form."[3]

A somewhat more comprehensive understanding of tonality came later for Zappa, through his first-hand encounters with certain popular repertoires that utilize the harmonic syntax of classic-period music. Specifically, following his short-lived college education, he became familiar with the Tin Pan Alley and "jazz standards" repertoire by performing as a guitarist in lounge-bands.[4] As with his formal education, Zappa described the experience as being somewhat traumatic: "I could tolerate that only for a short period of time (about ten months) but eventually I hated it so much, I just put the guitar in the case, stuck it behind the sofa and didn't play at all for eight months."[5] Thereafter, he spoke disparagingly of all the music he performed during this period.[6]

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[3] Frank Zappa and Peter Occhiogrsso, *The Real Frank Zappa Book* (New York: Touchstone, 1999): 187. As evidence of this point, Zappa claimed that he found classical period music "boring because it reminds me of '*painting by numbers*.'" That is, he likely concluded that such music slavishly adhered to the rules enumerated in modern harmony textbooks.

[4] The names of these bands were "The Boogie Men" and "Joe Perrino and the Mellotones." Neil Slaven, *Electric Don Quixote: The Definitive Story of Frank Zappa* (London: Omnibus, 1997): 33–34. Zappa remembered, "You had to read songs out of a (thick) brown book, flip the pages in the dark and see what the chord changes were." BBC interview by Nigel Leigh, quoted in Neil Slaven, *Electric Don Quixote*, 35.

[5] BBC interview by Nigel Leigh, quoted in Neil Slaven, *Electric Don Quixote*, 35.

In terms of harmonic vocabulary, the aspect of the aforementioned canon deemed most offensive by Zappa were progressions by descending fifth, particularly cadential gestures incorporating the circle of fifths. As he stated: "I've always been against dominant chords resolving to tonic chords."[7] In his autobiography, Zappa singled out the II-V-I progression in particular as "the essence of bad 'white-person music.'"[8] This same progression saturates many of the parody songs in his output, including the lounge-music parody "America Drinks" (ECE 1967), which he called "an exercise in II-V-I stupidity."[9]

> "America Drinks" is based on the same subconscious formula that all those pukers use. You know, II-V-I chord progressions, modulating all the way around. They normally modulate in regular songs in the circle of fifths. But this changes key and modulates and it gets weird.[10]

Example 4.1 provides an excerpt from the theme of "America Drinks." As indicated on the example, several descending-fifth progressions are found within, each implying, or sometimes confirming, a different key. Note in particular the sequence of II-V progressions towards the end of the excerpt.

Harmonic rhythm, and its implications for the treatment of melody, was similarly an area of contention for Zappa, especially considering the fact that his guitar duties during this period likely required improvisation. Along these lines, Zappa viewed the harmonic rhythm of the jazz-standards repertoire as an obstacle to the invention of quality melodic lines. He framed the

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[6] One peculiar fallout of this experience was Zappa's subsequent distaste for jazz music. Though we know jazz to be one of the key stylistic categories for his instrumental music, Zappa chose to equate the term "jazz" with a relatively limited corpus, namely the jazz standards and be-bop repertoire. See statements of former bandmembers in Charles Murray, "Jazz From Hell," BBC Radio 3 Documentary, 2003.

[7] Dan Forte, "Zappa 79/8," *Musician* 19, August 1979.

[8] Zappa and Occhiogrosso, *The Real Frank Zappa Book*, 187. Referring to music such as this as being based on "II-V-I" is fairly common in jazz discourse.

[9]I bid. In the original recording of "America Drinks" (on *Absolutely Free* (1967)), background ambience, including closing cash registers and noisy patrons, is included.

[10]Frank Kofsky, "Interview with Frank Zappa," *Jazz and Pop*, October 1967.

distinction between his ideal approach and that of the typical "jazz" improviser in reference to what are commonly called "chord changes."

> Some people like to play on II-V-I changes and can be-bop themselves into a frenzy; and there are other people who even like to listen to that sort of thing. I can't stand it myself. I pretty much *loathe* chord progressions. Look at Indian musical culture: they don't have too much in the way of progressions, and that's some of the most interesting, beautiful music ever. You don't need changes to play great lines.[11]

Though he does not make note of the fact, Zappa comments resonate with trends in jazz during the late 1950s/early 1960s, particularly with the "modal-jazz" movement. Scott D. Reeves, for example, identifies two categories of harmonic treatment in jazz, one based on "chord changes" and the other on the modal approach. He defines these categories solely in reference to harmonic rhythm, observing that chord changes are often used in compositions "in which all the chords generally last less than four bars."[12] Conversely, he defines modal compositions as those "in which all the chords last at least four bars."[13] As traditionally taught, these two categories require very different approaches from the standpoint of melodic improvisation. In the context of "chord changes," the improviser creates melodic lines "harmonically," choosing his or her improvised notes in accordance with the sounding harmonies by playing primarily chord tones and treating non-chord tones as embellishments.[14]

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[11] Matt Resnicoff, "Poetic Justice: Frank Zappa Puts Us In Our Place," *Musician*, November 1991.

[12] Scott D. Reeves, *Creative Jazz Improvisation* (New Jersey: Prentice-Hall, 1989): 163. Of course, literally the "chord changes" are the harmonic progressions that accompany the melody in a jazz tune or improvisation.

[13] Reeves, *Creative Jazz Improvisation*, 163.

[14] The playing of Charlie Parker is often considered the benchmark for this approach. See Owens, *Bebop: The Music and Its Players*: 28–45. With the rapidly shifting and complex harmonic outlines of be-bop tunes, "making the changes" became a great challenge to improvisers.

In modal jazz, on the other hand, the improviser is allowed greater melodic freedom through the use of scalar "modes" in conjunction with slowly shifting or static harmonies.[15]

Though Zappa never admitted to any influence of modal jazz, it is possible that some of the innovations of modal jazz were absorbed into his music.[16] As noted in Chapter 2, harmonic stasis and improvisatory melody are trademarks of his style. More importantly, theories of jazz, specifically those related to the modal approach, have the potential to offer insight into Zappa's diatonic music. In this chapter, I will argue that an understanding of the repertoire under discussion is best achieved in reference to the *Lydian scale*. The theory I will present is based on the contention that the Lydian scale, due to its special static properties, represents a "tonic" state in Zappa's diatonic music, and that non-Lydian events can be heard as functioning and communicating with the Lydian scale. An important precursor for my theory is George Russell's seminal jazz theory "The Lydian Chromatic Concept," which predated and influenced the development of the modal-jazz style. In the following section, I will summarize and critique the central theoretical premises of Russell's theory, particularly those most relevant to the chapter at hand. Thereafter, I will turn to a "new" Lydian theory of my own devising, which is intended to apply directly to Zappa's practices.

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[15] For a more comprehensive discussion of the elements of modal jazz, see Keith Waters, "What is Modal Jazz?," *Jazz Educator's Journal* 33/1 (2000): 53–55.

[16] Of course, it is also possible that he developed his approach independently of the modal-jazz movement. For example, both Zappa and certain musicians associated with modal jazz shared an interest in Indian and Middle Eastern music; John Coltrane, for example, studied briefly with Indian sitarist Ravi Shankar. This common thread of influence might explain some of the superficial similarities. Ingrid Monson, "Oh Freedom: George Russell, John Coltrane, and Modal Jazz," in *In the Course of Performance: Studies in the World of Musical Improvisation*, eds. Bruno Nettl and Melinda Russell (Chicago and London: University of Chicago Press, 1998): 158. The influence of Indian music was also prevalent in pop music of the time; the most famous manifestation of this influence is seen in George Harrison's experiments with the sitar and other aspects of Indian music in several songs by The Beatles. See Gerry Farrell, "Reflective Surfaces: The Use of Elements from Indian Music in Popular Music and Jazz," *Popular Music* 7/2 (1988): 189–205.

II. George Russell and the "Lydian Chromatic Concept."

Composer and bandleader George Russell (b. 1923) published his *Lydian Chromatic Concept of Tonal Organization* in 1953, several years before the first modal jazz albums of the late 1950s.[17] Even today, some still consider it to be the "most significant single theoretical treatise written about [jazz]."[18] According to Russell, Miles Davis—the musician widely credited with introducing modal jazz to the public—played a particularly important role in the early stages of his thinking:

> In 1945, I had a conversation with Miles Davis that would ultimately give both of us a new direction. . . . One night I asked him, "What's your musical aim?" He answered, "To learn all the changes." This seemed like a strange answer, because at the time Miles was famous for knowing all the chords. . . . what he really meant was that he wanted to find a new and broader way to relate to chords.[19]

Russell also claims that a later conversation with Davis, in which he explained to Davis his new theory, aided in Davis's composition of the piece "Milestones" (1958) (sometimes cited as the first modal-jazz piece). Another important figure in modal jazz, pianist Bill Evans—who recorded under Russell's direction on the albums *Jazz in the Space Age* and *The Jazz Workshop* (both 1956)—allegedly helped explain the "Lydian Chromatic Concept" (hereafter LCC) to the musicians on Davis's seminal album *Kind of Blue* (1959), which notably also included modal-jazz pioneer John Coltrane.[20]

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[17] Russell claimed to have conceived the basic theoretical premises of the theory in the mid 1940s. The best-known version of the "Lydian Chromatic Concept" was published in 1959.

[18] Richard Cook and Brian Morton, *The Penguin Guide To Jazz*, 5th ed. (London, England: Penguin Books, 2000): 1293.

[19] William C. Banfield, *Musical Landscapes in Color: Conversations with Black American Composers* (Lanham, Maryland, and Oxford: The Scarecrow Press, Inc., 2003): 60.

[20] Ingrid Monson, 150. In Eric Nisenson's overview of Miles's Davis's landmark modal-jazz album *Kind of Blue*, he lists George Russell, along with Miles Davis, John Coltrane, and Bill Evans (i.e., musicians who actually played on the album), as one of the four key musicians responsible for the album. See Eric Nisenson, *The Making of Kind of Blue: Miles Davis and His Masterpiece* (New York: St. Martin's Press, 2000): 50–73.

Russell viewed the LCC as "an organization of tonal resources from which the jazz musician may draw to create his improvised lines."[21] Therefore, the purpose of the theory is to demonstrate the various melodic possibilities that are open to the improviser when faced with a chord symbol in a performance situation. Previous jazz theory had held to traditional views of the relationship between melody and chord, whereby a clear harmonic relationship exists between every melodic pitch and its accompanying chord (i.e., chord tone/non-chord tone). In the LCC, Russell advocates viewing chords and *scales* as virtually synonymous. Therefore, the task of the improviser becomes to convert the chord symbol into "the scale which best conveys the *sound* of the chord."[22] Russell calls this process *vertical polymodality* (more on this term below), which "greatly frees the improviser from the vertical limitation of arpeggiated playing."[23] That is, once the correct scale has been determined, any note within that scale can be utilized freely over the given chord.

The basis of Russell's theory is his contention that the *Lydian* scale best represents the sound of the major chord: an idea he claims was inspired by hearing be-bop musicians "ending their pieces on the flatted-fifth tone [i.e., sharp fourth] of the key of the music."[24] According to Russell, the major scale, traditionally considered the representative of major tonality, "does not completely fulfill, agree with or satisfy the tonality of its tonic major triad."[25] He supports this assertion first in reference to the tetrachordal structure of the major scale and that of the Lydian

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[21] George Russell, *The Lydian Chromatic Concept of Tonal Organization for Improvisation* (New York: Concept Publishing Co., 1959): 1 of Introduction.

[22] Ibid., 1.

[23] Ibid., 22.

[24] Olive Jones, "A New Theory for Jazz," *The Black Perspective in Music*, Vol. 2, No. 1 (1974): 63.

[25] Russell, *The Lydian Chromatic Concept of Tonal Organization*, i.

scale (see Example 4.2). Of interest to Russell is the placement of T-T-S (tone-tone-semitone) tetrachords within these two scales, which he views as having the potential to be heard as tonicizing gestures (i.e, being equivalent to an ascending scale from the dominant to the tonic scale degree in the major scale). As shown in C major (Example 4.2a), the major scale's T-T-S tetrachords emphasize the root (C) and fourth (F). In the C Lydian scale (Example 4.2b), on the other hand, these tetrachords emphasize the root (C) and fifth (G). According to Russell, the "different tonalities" embodied by these tetrachords favor the use of the Lydian scale to represent its tonic major chord.[26] Citing Paul Hindemith, Russell concludes that "the tonic of an interval of a fourth is the upper note, while the tonic of an interval of the fifth is the lower note."[27] Consequently, the "two tonalities" of the C-major scale (the fourth C-F) are actually in agreement with F-major tonality, while those of the C-Lydian scale (the fifth C-G) effectively convey its tonic C-major triad.

Russell also finds justification for the Lydian scale in the overtone series. Noting the strength of the perfect fifth interval in the overtone series, Russell observes that if one proceeds in ascending perfect fifths from the tonic of a Lydian scale, the complete diatonic collection will be produced.[28] This is demonstrated in Example 4.3, wherein the F-Lydian scale is generated by the cycle of perfect fifths from the tonic pitch. Applying this same method to the major scale, of course, would require the alteration of the final perfect fifth to a diminished fifth. Stated another way, if one wishes to generate the C-major scale entirely by ascending perfect fifths, one would

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[26] Ibid., i.

[27] Ibid., iii. The relevant passage from Hindemith is found in *The Craft of Musical Composition*, (New York, NY: Associated Music, 1942; rev. ed., 1945: 68.

[28] The role of the perfect fifth as cyclic generator has likewise been of import to subsequent theories based on the diatonic scale. See Ramon Fuller, "A Structuralist Approach to the Diatonic Scale," *Journal of Music Theory* 19/2 (1975): 182–210; Robert Gauldin, "The Cycle-7 Complex: Relations of Diatonic Set Theory to the Evolution of Ancient Tonal Systems," *Music Theory Spectrum* 5 (1983): 39–55; and Eyton Agmon, "A Mathematical Model of the Diatonic System," *Journal of Music Theory* 33/1 (1989): 1–25.

need to start on the subdominant pitch (F). Russell considers this point to be further evidence that the major scale is better suited to the sound of the fourth of the scale.

Russell imagined this theoretical finding as a product of evolution, but one which required a shift in direction backwards to Pythagoras and other Greek philosophers. Generating the Lydian scale by the cycle of ascending fifths represents part of this return to Pythagorean thought (as Pythagorean tuning was similarly achieved via fifths). Russell viewed the major scale as not being "based on any big law," and its predominance in traditional music theory as an impediment to the recognition of the Lydian scale: "If the theorists had kept the philosophical meaning of the Pythagorean tuning system along with the invention of equal temperament, the resultant ideas would have been much closer to the truth. The Lydian scale would have emerged naturally."[29]

More fundamental justification for the Lydian scale is offered in consideration of the functionality and compositional usage of major and Lydian scales. Russell differentiates these two scales in reference to "horizontal" and "vertical" thinking. The major scale represents a "horizontal scale" in that it emerges from particular chord successions that unfold "horizontally":

> The major scale probably emerged as the predominating scale of Western music because within its seven tones lies the most fundamental harmonic progression of the classical era—the tonic major chord on C—the subdominant major chord on F—the dominant seventh chord on G—thus, the major scale represents a crystallization of the fundamental harmonic progression of the classical era.[30]

This view of major-scale tonality comports in some ways with that espoused much earlier by Francois Joseph Fétis (1784–1871). Fétis considered tonality to be "the succession of melodic and harmonic facts that arise from the disposition of the distances of tones of our major

[29] Olive Jones, "A New Theory for Jazz," 70–71.

[30] Russell, *The Lydian Chromatic Concept*, iii–iv.

and minor scales."[31] For Fétis, a watershed moment in the creation of tonality (the *ordre transitonique*) was the "discovery" of the functional attributes of the dominant-seventh chord within the major scale, and how this chord allowed processes of modulation. Therefore, both Fétis and Russell observe the potential for functional tonality in the major scale, specifically that of the descending-fifths variety. They arrive at this conclusion from opposite vantage points, however, as Fétis sees the major scale as a pre-existent entity from which "discoveries" are made, while Russell seems to imply that the chord progressions exist prior to the scale, and that the tones of the scale arise as a result of the harmonic progressions.

Given the importance of functional progressions to the "horizontal" method, it is not surprising, then, that, along with the major scale, Russell lists the "blues" scale as an additional horizontal scale, as blues progressions are similarly comprised of chords on the tonic, subdominant, and dominant degrees. Harmonic rhythm also seems to be key to Russell's horizontal/vertical dichotomy, as he observes that horizontal scales are most useful "when rapidly moving chord progressions make improvising difficult [e.g., be-bop]."[32] Nevertheless, the types of chord progressions most commonly used in such contexts are functional progressions within a key.

Russell's concept of *vertical polymodality*, as already stated, treats scales as conceptually synonymous with chords. The term "vertical" in this context implies a static tonal relationship between chord and scale, in contradistinction to the horizontal orientation of the major scale: "The major scale *resolves* to its tonic major chord. The Lydian scale *is* the sound of its tonic

[31] Francois-Joseph Fétis, *Esquisse de l'harmonie*, trans. Mary I. Arlin (Stuyvesant, NY: Pendragon Press, 1994): 156.

[32] Ibid., 35.

major chord."[33] The "ladder of fifths" that produces the Lydian scale is also envisioned as a static structure, qualifying the Lydian scale as the true "scale of *gravity*."[34] Russell considered the "vertical" potential of the Lydian scale to be a musical resource at that time underutilized. As much Western music and music theory had been oriented towards horizontal matters (i.e., the function of chords and progressions within keys), the static Lydian mode was "unfulfilling because it *stayed there,*" without "having to digress from the tonic chord."[35]

Having established the Lydian scale as representative of major tonality, Russell proceeds to create a tonal system based on the Lydian scale. The diatonic portion of this system is given in Example 4.4. Russell finds it unnecessary to justify other diatonic chords/scale pairings as exhaustively as he did for the major chord; instead, these relationships are *derived* from the Lydian scale. Russell refers to the Lydian scale as the "parent" scale of all structures listed on Example 4.4, claiming further that the Lydian scale "has the same meaning as what is traditionally termed 'the key of the music.'"[36] His process of derivation is achieved simply by creating "modes" of the Lydian scale. (Russell does not utilize any of the traditional modal names such as Ionian, Dorian, Phrygian, etc., referring instead to Mode I, Mode II, etc.) From each scale degree/modal tonic of the Lydian scale, he builds chords, most of which are typical jazz sonorities and are indicated in jazz parlance. To use the chart, the reader is instructed: (1) to find a given chord type on the chart; and (2) considering the scale degree on which a particular chord type appears, to use the appropriate parent Lydian scale in which that chord would be found. For example, if one is presented with a D-minor chord, or any of the other tertian

[33] Ibid., iv.

[34] Bob Blumenthal, "George Russell: Stratus Seeker," *Downbeat* 50 (1983): 25.

[35] Olive Jones, 71–72.

[36] Russell, 43.

sonorities in the minor-chord family, one would locate the minor chord on Mode VI of the Lydian scale, and would therefore improvise in the F-Lydian scale, where D is scale-degree six.[37]

Within the modes of the Lydian scale, Russell locates three of what he considers to be the five "basic" chord families—the five being major, minor, dominant seventh, diminished, and augmented. The major-chord family is found on Mode I (Lydian), while the dominant-seventh family and the minor-chord family are found on Modes II (Mixolydian) and VI (Dorian), respectively. If the parent Lydian scale is truly intended to represent a "key" in the traditional sense, the scale-degree placement of the minor and dominant-seventh chord families in Russell's system has interesting parallels and/or conflicts with traditional major-key tonality. For example, a major key and its "relative" (natural) minor scale have a similar scale-degree relationship in the major-key system as in the Lydian system; that is, natural minor is found on scale-degree six in a major key, while the minor-chord family is found on scale-degree six in the Lydian system. In terms of modal labels, the Lydian system substitutes the Dorian mode for the Aeolian mode of the major-key system. However, Russell explains it differently, noting that, under the C-Lydian parent scale, Mode VI of the Lydian mode "produces more chords of the A Minor Chord Family than the C Major Scale . . . the C Major Scale produces an A Minor Triad, and an A Minor 7th, but it cannot produce an A Minor 6th Chord."[38] This method of explanation suggests that chords exist prior to the given tonal system. For example, a tonic "minor-6th chord"—a minor triad with an affixed major sixth—already implies the Dorian mode. However,

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[37] This method of explanation is quite different from merely instructing the reader to "improvise in the Dorian scale over minor chords," though most readers probably simplified the theory by interpreting Russell's statements as such.

[38] Ibid., v.

this fact does not explain *why* one would choose a major sixth rather than a minor sixth within minor tonality.

Russell's location of the dominant-seventh-chord family on Mode II is more problematic theoretically. In the major-scale system, this chord appears on scale-degree five and resolves by descending fifth to the tonic of the scale, achieving the characteristic "horizontal" progression of the major-key tonality. A similar resolution of the dominant seventh by descending fifth to the tonic of the Lydian system is clearly not possible. Russell never provides any musical justification for the Mode II generation of the dominant-seventh chord, and there is perhaps no reason to expect any such evidence. Though he views the parent Lydian scale as akin to a key, his modes do not actually substitute for the scale-step theory traditionally applied to the major-scale system. Instead, the dominant-seventh chord's placement on scale-degree two of the Lydian scale is merely objective fact, having no musical significance per se. This reveals a crucial weakness of the theory as a whole, as most of the mode/chord relationships could be assigned just as easily within a major-scale system; in the case of the dominant-seventh chord, its placement on the fifth scale step of the major scale seems more appropriate both theoretically and pedagogically. Perhaps in "vertical" situations, where the goal is to find the scale that represents the sound of the chord, the potential dominant functionality is less central. Russell leaves this question unaddressed.

Russell finds less of use in the remaining four modes of the Lydian scale. Within Modes #IV and VII, he lists several chords, but these chords do not congeal into unified "chord families" as for Modes I, II, and VI. Of greater interest is his almost complete avoidance of Modes III (Aeolian) and V (Ionian). For both of these modes, he merely assigns the function of "inversions of Modal Tonic I chords." The inversional (6/4?) function of Mode V (Ionian) is explained by his earlier discussion of its tetrachordal structure, which Russell viewed as emphasizing the fourth of the scale (i.e, the Lydian tonic). As for Mode III (Aeolian), it is likely that Russell's bias against the traditional "horizontal" scales is a factor is its relatively small role within the modal system.

The remaining aspects of the LCC consider structures that arise from outside of the diatonic scale, thereby achieving the freedom of utilizing all twelve pcs when improvising. Russell intended for his theory to apply to "all the music that has been written or that could be written in the equal tempered tuning system."[39] Because my focus is on diatonic music, these aspects of the theory have little relevance to the topic of the chapter at hand; nevertheless, I will describe them briefly. Russell cites five additional scales for potential usage by the improviser: (1) the Lydian Augmented scale (a Lydian scale with a raised fifth); (2) the Lydian Diminished Scale (a Lydian scale with a lowered third); (3) the Auxiliary Diminished scale (an octatonic scale beginning with a whole tone); (4) the Auxiliary Augmented scale (a whole-tone scale); (5) the Auxiliary Diminished Blues scale (an octatonic scale beginning with a semitone). As with the Lydian scale, he locates various chords on certain modes (scale steps) of the scales. For example, the Lydian Augmented Scale produces the augmented chord on Mode I, while Mode I of the Lydian Diminished scale generates the diminished-chord family. Because these two scales complete the "basic" chord families (major, minor, dominant-seventh, augmented, diminished), all other scales are labeled "auxiliary," representing "distinctive tonal shades of [the Lydian Chromatic scale]."[40] All six of these scales, including the diatonic Lydian scale, form the

[39] Ibid., V.

[40] Ibid., x.

"Lydian Chromatic scale." That is, when combined, the scales utilize all twelve pcs of the equal-tempered system.

The "chromatic" aspects of Russell's theory have had little influence on jazz theory pedagogy, as is reflected in the more widely available textbooks on the subject. However, the basic concepts relating to diatonic chords and scales have become essential to what is called "chord/scale" theory in jazz: a theory predicated on the same "vertical" focus espoused by Russell. However, his Lydian-oriented modal system has not been adopted, replaced instead by a more traditional emphasis on the major scale. (Other modal systems, including those of non-diatonic scales such as the melodic and harmonic minor, are also cited by some).[41]

Due to the major-scale orientation of most mode/scale theories, the distinction Russell makes between "vertical" and "horizontal" conceptions of melodic improvisation has been at times either ignored or confused. This confusion has led, for example, to some disagreement over whether the major scale or the Lydian scale is most appropriate when improvising over a major chord. Scott D. Reeves, for example, states that "the major scale is the best scale choice when the [major] chord is functioning as a I chord, while the Lydian mode is the best choice when the chord is functioning as a IV chord."[42] Why, though, would one choose to think in terms of modes when the chords in question have clear functionality? If one recognizes that a major chord is functioning as IV, why not think in terms of key, the horizontal approach? Similar insistence on discussing chord/scale relationships within functional tonality has marred the understanding of such stalwart tonal progressions as II-V-I, as Bert Ligon describes well:

> In many chord/scale theory discussions, each of the chords is assigned a different scale: Dm7 is labeled D dorian; G7 as G mixolydian; and Cmaj7 as C Ionian. Describing this passage as three

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[41] See, for example, Bert Ligon, *Jazz Theory Resources* (Wilwaukee, WI: Houston Publishing Inc, 2001): 333-369. Ligon also creates modes for the harmonic major scale (a major scale with lowered sixth).

[42] Scott D. Reeves, *Creative Jazz Improvisation*, 31–32.

> different modes or scales is misleading and unnecessarily complicated. It is doubtful that anyone hears three different tonics in this passage as is suggested by the three modes. All of these chords were derived from the C major scale, and that one scale best describes the passage.[43]

Perhaps Russell's decision to locate the dominant-seventh family (Mixolydian) and the minor-chord family (Dorian) on scale-degrees of the Lydian scale was partly an attempt to circumvent the easy confusion that might result when trying to contend with the II-V-I progression in terms of modes. Therefore, when the dominant-seventh chord family is found on Mode II of the Lydian mode rather than on scale-degree five of the major mode, the reader would be less likely to equate these chords with a true dominant-functioning chord. Similarly, locating the minor chord family on Mode VI of the Lydian scale rather than scale-degree two of the major scale discourages the reader from automatically associating the Dorian scale with a functional II chord.

Russell's contention that the Lydian and Dorian (Mode VI) modes are, respectively, better suited to major and minor chords than the Ionian and Aeolian scales has also been influential in jazz theory. The Dorian/minor-chord relationship has become particularly well-established. Mark Levine states flatly that "Aeolian chords are rarely played."[44] Most authors point to consonance and dissonance structures in justifying the use of the Dorian scale, as it "maximizes tension [tertian extensions of the triad] and minimizes dissonance when compared to the other minor scales."[45] Authors seem more reticent to completely dismiss the traditional association of the Ionian mode with the major scale, however. Many still contend that the Ionian mode is most appropriate for major and major-seventh chords. Nevertheless, Russell's mistrust of the "Ionian fourth"—its potential to imply a tonality at odds with the intended tonic—has

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[43] Bert Ligon, *Jazz Theory Resources*, 331.

[44] Mark Levine, *The Jazz Theory Book* (Petaluma, CA: Sher Music Co., 1995): 52.

[45] Andrew Jaffee, *Jazz Theory* (Iowa: WM. C. Brown Company Publishers, 1983) 51. This explanation is reminiscent of that given by Russell. Similarly, it seems to imply the extended tertian chords exist prior to the tonal system that might have contributed to their formation.

manifested itself most conspicuously in the concept of the "avoid note." This concept holds that the performer is to either "avoid" or "handle with care" the fourth of the scale when improvising in the Ionian mode over a major chord. Levine notes that "before the bebop era, most jazz musicians played the 4th of a major chord [sic] as a passing note only."[46] Of course, if a pitch is truly heard to function as a "passing" note, the approach being applied cannot be that of the "vertical," which holds that all pitches within the scale can be used *freely* over the chord. Therefore, the continued citations of the major-chord/Ionian relationship may likewise be a result of the disregard of the distinction between "vertical" and "horizontal" conceptions.

To this date, no study has been conducted exploring the potential influence of Russell's theories in the music of jazz musicians.[47] One would certainly expect plenty of evidence for the most basic tenets of the theory, particularly the association of modes with certain chords. As one famous example, Miles Davis's composition "So What" from the album *Kind of Blue* (1959) is comprised of only two chords, D-minor seventh and Eb-minor seventh, both of which are accompanied by improvisations in the Dorian mode: a chord/scale pairing advocated in the LCC. However, this chapter is not intended to address any further parallels between the LCC and jazz. Instead, we return to Zappa's diatonic music, a repertoire by no means limited to works in a jazz style.

As stated above, certain aspects of Zappa's music, including the preference for slow harmonic rhythm and improvisatory melody, seem tailor-made to Russell's theories.[48] More significantly, Zappa's approach to modality—particularly his preference for the Lydian mode—

[46] Levine, 37–38.

[47] Peter Bert considers the influence of the "Lydian Chromatic Concept" on the music of Toru Takemitsu in "Takemitsu and the Lydian Chromatic Concept of George Russell," *Contemporary Music Review* 21/4 (2002): 73–109.

[48] It should be stressed, however, that there is no evidence that Zappa was familiar with the LCC.

offers the potential for parallels. In fact, the Lydian mode can easily be considered the characteristic sound of Zappa's diatonic music. As will be seen, several additional points of intersection exist between the tonal structures within this repertoire and the theoretical concepts of the LCC. Specifically, we will see how conceptualizing the Lydian scale as a "tonic" state, in which non-Lydian events function, can be analytically fruitful (something never attempted by Russell). The following discussion is divided into three parts. First, I shall lay out the fundamental theoretical apparatus to be employed, which, while loosely based on the LCC, also contains substantial refinements intended to account for characteristic techniques in Zappa's music. Following this demonstration, I will discuss each of the modes within this theoretical system in turn, detailing the manner in which they each associate abstractly with the Lydian scale. Finally, I will turn to contextual uses of this tonal system, whereby the modes of the system interact in various ways. In this final section, we will witness how the Lydian scale can truly act akin to a "key" for the music.

III. A Lydian theory for Zappa's diatonic music.

A. Theoretical fundamentals.

Example 4.5 offers three different manifestations of the Lydian scale. The first two, which contain scalar and "stacked thirds" representations respectively, are familiar from traditional tonal and jazz theories. When referencing either of these two models, I will employ familiar scale degree labels and extended-tertian nomenclature (e.g., 7th, 9th, 13th). The third, which represents the scale as a stack of fifths as described by Russell, is particularly useful for our purposes. The pitches of the "Lydian fifth-stack" will hereafter be labeled with pitch numbers from 1 to 7 according to their ordered placement within the generative T7 cycle (i.e., F=1, C=2, etc). This T7 cycle also provides a means by which to derive a modal system. Example 4.6 offers a *Lydian system*, a term I will use to describe a collection of diatonic modes within the overriding Lydian mode (here shown in F Lydian). The Lydian system includes five potential modes, which are created when any of the first five pitches of the Lydian fifth-stack are asserted as local tonic. All five modes within a given Lydian system contain the same pitch content; therefore, in the example given, C Ionian, G Mixolydian, D Dorian, and A Aeolian are all considered members of the F-Lydian system. Besides viewing the Lydian mode as the overall tonic of the system, Example 4.6 corresponds with Russell's modal system (Example 4.4) in several ways. First, the three basic "chord families" cited by Russell are here manifest as Zappa's most-commonly employed modes: namely Lydian, Mixolydian, and Dorian. The two remaining modes, Ionian and Aeolian, for which Russell found little use, also have tenuous status in Zappa's music. For this reason, question marks are applied to them on Example 4.6 presently.

As shown in Example 4.6, pitches #6 and #7 of the Lydian fifth-stack do not furnish modes. Instead, they are labeled as "leading tones," in recognition of the important tonicizing function they perform in relation to the tonic and fifth of the Lydian scale (as described by Russell, but here without reference to tetrachords). Musically, these pitches are thereby primarily relegated to a melodic role. Significantly, these two leading tones are different than those traditionally associated with major-scale tonality. Ramon Fuller, in his discussion of the structural properties of the diatonic scale vis-à-vis the Ionian mode, identifies those pitches comprising the tritone as the leading tones of the scale (e.g., F and B in the C-major scale).[49]

[49] Ramon Fuller, "A Structuralist Approach to the Diatonic Scale," *Journal of Music Theory* 19/2 (1975): 196.

These pitches gain this status due to their semitonal resolution to the root and third of the major tonic triad. In the Lydian-oriented theory, the leading tones similarly resolve by semitone to pitches of the major triad. However, the leading tones of the Lydian system are not by their nature harmonic; that is, they do not combine to form a dissonant tritone within a dominant harmony. Instead, they merely reinforce the strongest harmonic interval of the Lydian scale, and thereby provide the Lydian scale with its privileged position within the tonal system.

In musical realization, Zappa's diatonic music typically involves three texturally stratified areas, consisting of bass, chord, and melody.[50] Example 4.7 labels these three zones of activity the *pedal*, *chordal*, and *melodic* zones, respectively. Each of these zones performs specific tasks in the music, which are summarized in Example 4.7. The melodic zone is customarily assigned the entire seven-note diatonic collection of the given Lydian system. Considered on its own, however, the melodic zone remains tonally ambiguous, not clearly asserting any of the seven diatonic pitches as tonic. Therefore, all such melodies are hereafter interpreted as being Lydian in essence, except in rare cases in which a non-Lydian tonic is clearly in evidence. The chordal zone is most often represented by a single chord within a musical segment. Though no restrictions are placed on cardinality, Zappa's preference is for sparse, three-note chords.[51] Tonal ambiguity also factors in the chordal zone via the employment of chords of indeterminate root (i.e., "rootless" chords), which will be discussed in more detail below. Finally, a pedal zone is identified. The term "pedal" is intended to reflect the sustained, drone-like nature of Zappa's bass lines. However, even when not set as a drone, as in ostinato

[50] Textural stratification has also been identified as an important feature of rock music. See, for example, David Temperley, "The Melodic-Harmonic 'Divorce' in Rock," *Popular Music* 26/2 (2007): 323–342.

[51] Zappa saw this preference as a polar opposite of the typical jazz approach to accompanying: "The other thing that is difficult is to . . . convince the keyboard players that a simple part assigned to them is the thing that's gonna do the job . . . .   There's so much temptation to *jazz out*. Jazz-oriented keyboard artists are the worst thing to happen to orchestration. As quoted in Michael Davis, "Little Band We Used To Play In," *Keyboard*, June 1980.

accompaniments, the pedal is identified as the lowest pitch and/or most emphasized pitch in the music.

Given the ambiguity of both melodic and chordal zones, the pedal zone plays an especially important tonal role in the music. The following quote by Zappa indicates its function:

> The important thing I expect the bass player to do is to tell me what key I'm in. I'm not looking for notes faster than what I'm playing for implications of harmonic situations other than what we started out doing. . . . And I like bass players that tell you the story by playing the roots once in a while. A lot of the *modernistic-type* personages don't want to do that. They think it's beneath their dignity to play the bottom note of the chord.[52]

One implication of this quote is that the pitch that serves as the pedal should always be interpreted as the local tonic. Of course, "root" and "tonic" are not necessarily synonymous in traditional tonal theory. Within the vertically-oriented Lydian theory, however, there is better reason to view these terms as synonymous, at least on the most local level. In asserting itself as root in reference to the ambiguous sonorities of the chordal zone, the pedal zone acts as a "root representative." As discussed by Daniel Harrison (following Paul Hindemith), these tones are "promoted to the office of root by some contextual power," normally because they are "a marked bass note of some kind: the loudest, longest, deepest, prettiest, biggest, and baddest."[53] In reference to the melodic zone, the pedal zone functions as local "tonic representative." Therefore, the pedal zone *orients* the listener's perception of both melodic and chordal zones.

As a preliminary musical demonstration of the immediately preceding suppositions, consider the opening phrase of "Uncle Meat" (ECE/ACE 1968/1969a) (Example 4.8). Here I have provided only melodic and chordal zones, reserving the pedal zone for later discussion. As

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[52] Frank Zappa, "Non-Foods: Bass, Sports, and Adventure," *Guitar Player Magazine*, March 1983.

[53] Daniel Harrison, "Dissonant Tonics and Post-tonal Tonality," Unpublished paper originally read at Music Theory Society of New York State, 2002: 7–8.

stated above, the chordal zone is here represented by a single reiterated chord, while the melodic zone is entirely diatonic. When both given zones are combined, a complete diatonic collection is formed, namely the G-Lydian scale (i.e., two sharps). Though diatoncism is clearly in evidence, a tonic is less easily extracted from the musical surface. Traditionally, the listener's identification of tonic relies on a process described by Richmond Brown as *position finding*.[54] This method involves locating the tonic in relation to the intervals that are most rare within the diatonic set. Melodically, these are intervals of ic 6 and ic 1, corresponding to the dissonant tritone and its two semitonal resolutions, respectively.

Looking at the melodic zone of "Uncle Meat," the positional-finding approach is difficult to apply. As shown, ic 5, the most prevalent interval in the diatonic set, saturates the surface. Besides isolated occurrences of ic 5, the set (027), created by the double application of ic 5, occurs in various guises throughout the phrase: (1) as a stack of fourths at m. 1; (2) as two T7-related melodic "sus-2" formations at m. 3; and (3) as a stack of fifths created by the accented pitches of m. 5. All such ic 5 occurrences obscure one's identification of tonic, due to the location of ic 5 in six different places within the diatonic scale.[55]

The chordal zone of Example 4.8 relies on similarly ambiguous structures, consisting of a sus-4 chord, of set class (027). Harrison notes the inherent ambiguity of chords built from the "stacking" of a certain interval, citing Hindemith's view that stacks of fourths have an "indeterminate root."[56] Apparently, Zappa held similar views of (027) sonorities. He described

[54] Richmond Browne, "Tonal Implications of the Diatonic Set," *In Theory Only* 5/6–7 (1981): 7.

[55] Given the few occurrences of ic 1 between C# and D in the phrase, it is likely that most listeners would identify D as the most likely tonic, if only given the melody as evidence. As we shall see, however, such an approach would typically lead one to the incorrect answer for Zappa's music.

[56] Ibid., 7–8.

his first use of sus-4 chords, as well as sus-2 chords (also being (027)), as an important breakthrough in the development of his diatonic style:

> I started writing my own music in which the thirds were omitted from the chords. That seemed to give me more latitude with the melody because if there's no third in the chord then you're not locked into an exact statement that your *harmonic climate* is major or minor. If your have a root, a fourth and a fifth, or a root, a second and a fifth, your ability to create atmosphere and imply harmony by having a variety of bass notes that will *argue* with the suspended chord gives you, for my taste, more opportunities. Then the melody line can go back and forth between major or minor and Lydian or whatever else you want with ease. You have more flexibility.[57]

As explained by Zappa, (027) sonorities were applied as alternatives to more conventional major and minor triads. While major and minor triads exist in only three spots each within the scale, (027) chords are among the most prevalent sonorities found in the diatonic scale, occurring at five different positions. Therefore, the "flexibility" described by Zappa, allowing one to orient the listener towards different positions of the scale, is exploited by the pedal zone, which acts as root/tonic representative.

B. The *modes of the Lydian system.*

We now turn to a more specific discussion of each mode within the Lydian-based modal system. Our focus in this section will be on the "vertical" aspects of each mode, particularly on how the modes are each realized as discrete static "blocks" in Zappa's music. Throughout, we will examine how the pitch structures of the Lydian scale retain influence even when the Lydian pedal is not phenomenally present. That is, non-Lydian modes will be considered herein as different "shades" of the Lydian tonic. Therefore, our first task is to comprehensively detail the structures occurring in tandem with the Lydian pedal. Thereafter, the significance of each

[57] Paul Zollo, "The SongTalk Interview," *SongTalk*, Volume 2, Issue 5, 1987. In 1984 Zappa described the sus-2 chord similarly, noting that "it's like a neutral piece of canvas that you can paint on, and consequently, the bass notes that support that chord (a lot of different bass notes can be used) [create] another set of mathematical possibilities for the melody notes that are happening on top of it. Anonymous interviewer, "The Frank Zappa Picture Disk Interview 1," 1984.

subsequent mode will be shown to rely on correspondences and/or departures from these referential structures.

1. Mode I: Lydian.

As mentioned previously, the Lydian mode is by far the most commonly encountered mode in Zappa's diatonic works. For this contextual reason, as well as its various structural attributes, it is viewed as the foremost "tonic" of the modal system. Of the many examples in which Lydian was contextualized as tonic, consider the introductory guitar solos to Zappa's concerts from 1978–79. Texturally, this improvised event consisted merely of a sustained pedal on E, over which Zappa would embark on a lengthy E-Lydian solo. Besides being given such a prominent placement within his live shows, these opening solos also provided Zappa with the melodic material of his most extensive guitar-solo derived piece: "Sinister Footwear III" (ACE 1978/unreleased) or "Theme from the Third Movement of Sinister Footwear" (ECE 1978/1981c).[58] This piece demonstrates well the employment of Lydian in service of the "vertical" conception, whereby a single scale functions as a completely consonant entity over a pedal (or chord). It is in static contexts such as this that the Lydian mode most commonly appears.

The appropriateness of the Lydian scale in static textures—as opposed to the traditional horizontal/functional employment of the major scale—is demonstrated in the main theme of "Holiday in Berlin" (ECE 1961/1970a). Examples 4.9 a–c show excerpts from three adjacent thematic modules of the theme, labeled Theme A (part 1), Theme A (part 2), and Theme B. As

[58] These opening solos furnished material for a number of Zappa titles, including, but not limited to, "He Used to Cut the Grass" (1979d) and "Packard Goose" (1979d). Eventually, this E-Lydian solo was moved from the opening slot of concerts to the piece "Easy Meat," where it functioned as the internal solo of that song from 1980–1982.

can be seen, all three modules are nominally "in D" (i.e., having a tonic of D). However, both parts of Theme A are clearly "horizontal" in harmonic treatment; they feature chord shifts every one or two measures and utilize exclusively II-V-I chord progressions. Accordingly, their pitch collection is almost entirely based on the major scale (D major).[59] Conversely, in Theme B (Example 4.9 c), which follows immediately from Theme A, functional harmonic progression is replaced by a single D pedal that persists for the theme's entire 23 measures. Accordingly, given the static aspects of this harmonic environment, the Lydian scale usurps the previously established major scale in the melody.

Example 4.10 lays out the basic pitch materials occurring within Zappa's Lydian-mode pieces. As shown, Zappa's music reveals a relatively small preferred roster of chords in this mode.[60] By far the most characteristic chords in the Lydian mode are the quintal (i.e., stacked fifths) and sus-2 chords, both of which consist of pitches #1–#3 in the fifth-stack representation of the Lydian scale (here F-C-G). The sus-2 chord is thereby conceptualized as a modified version of the quintal chord, in which the top note of the quintal realization (G) is flipped below the middle pitch (C). That is, the sus-2 chord herein is not viewed as merely an altered version of the major triad, but as a sonority that directly engages with the T7-cycle generation of the tonic Lydian scale. The prime example of the sus-2/Lydian correlation is the piece "The Black Page #1," which exclusively utilizes sus-2 chords. Each shift in pedal, along with the accompanying sus-2, is heralded by a change to the Lydian scale based on that pedal. In sum,

[59] The only pitches not in the major scale occur over an altered V7 chord (with b9 and #5) in Theme A (part 2).

[60] This collection of chords reflects best Zappa's favored harmonies in his ECE works. In chapter 5, the specifics of Zappa's treatment of chords in the ACE pieces will be discussed.

the piece features seven different Lydian scales: in order of appearance, G, Bb, D, Gb, C, C#, and B.

The characteristic Lydian sus-2 chord also controls to some degree the triads that may occur above the pedal. That is, only the three major triads of the diatonic scale are permitted above the Lydian pedal. These triads, as shown on Example 4.10 (the complete tertian representation of the Lydian scale), occur on the same scale degrees that comprise the quintal/sus-2 chords (here FM, CM, and GM). The piece "Night School" (SYN 1986b), for example, realizes its chordal zone with the aforementioned major triads. Example 4.11 provides the first statement of a harmonic succession that recurs rondo-like throughout the piece, representing a tonic harmonic zone of the piece. This passage utilizes the C-Lydian collection, with a prominent pedal on C running throughout. Above the pedal, a descending stepwise line from B to E is harmonized with the major triads of C Lydian (CM, GM, DM). (The harmony for each melodic pitch is determined according to which chord succession produces the smoothest voice leading. For example, considering the succession from chord two (DM) to chord three (CM), Zappa chooses CM for chord three (as opposed to GM) because it results in smoother voice leading.[61]) Of these three major triads, that found on scale-degree two/pitch #3 is of particular interest, as it provides the characteristic raised fourth scale degree of the Lydian mode. This triad is often superimposed above the Lydian pedal. The majestic introduction to the piece "Re-Gyptian Strut" (1972/1979a), which consists of a pedal-plus-chord texture in C Lydian, is constructed of this superimposition. As shown in Example 4.12, almost all chords formed by the brass throughout are D-major triads; further, the highest (melodic) voice of these chords arpeggiates the same D-major triad.

[61] Of course, certain melody notes, such as F#, only allow for harmonization by one of the major chords.

Another phenomenon unique to the accompanying zones (pedal/chordal) of Lydian-based music is the establishment of more extensive T7-cycles. This technique is an additional musical manifestation of the upwards generation of the Lydian scale from the Lydian tonic by fifths. Two examples are given in Example 4.13, one from the introduction to “Night School” (Example 4.13a), and the second from “Revised Music for Guitar and Low-Budget Orchestra” (ECE/ACE 1969/1978b) (Example 4.13b). In Example 4.13a, the complete T7 cycle is created between the Lydian pedal C, which sustains the first pitch of the cycle, and the chordal zone, which completes the cycle (G-D-A-E-B-F#).[62] In Example 4.13b, also in C Lydian, C gains its pedal status due to its privileged position within the cycle. As the example indicates, the first six pitches of the C-Lydian fifth-stack are located in the ostinato, while the initial pitch of the guitar solo adds the final diatonic pitch F#. Both of these examples suggest a degree of hierarchy existing with the fifth-stack when manifested harmonically, specifically in relation to the special use of the relatively unstable “leading tones” of the scale (pitches #6 and #7 of the fifth-stack). In Example 5.13a, for example, pitch #7 (F#) plays its intended “tonicizing” role, as its appearance both before and at the end of the cycle leads by semitone to G. In Example 5.13b, pitch #6 (B) occurs in the “wrong” place in the cycle (i.e., not after E). As in Example 5.13a, B performs a tonicizing function in relation to the tonic (C) at the outset of the ostinato, thereby allowing C to be more easily heard as the pedal. In fact, the first statement of the ostinato is elongated by one quarter note from subsequent statements in order to repeat this semitone motion from C to B.

As previously stated, melodic zones typically employ the entire diatonic collection in a given static block. Otherwise, there are no concrete rules for pitch succession in the melodic

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[62] While this is essentially a “melodic” idea, it belongs to the chordal zone due to the fact that it is played by the accompanying instruments. In fact, this is the only “melody” played by the accompaniment in the entire piece, a fact that supplies this moment with greater structural weight.

zone, as the "vertical" concept upon which Zappa's diatonic music is based allows all pitches to proceed "freely." In the Lydian mode, there is one additional (and peculiar) constraint in the melodic zone. As indicated in Example 4.10, melodies above the Lydian pedal most often feature only six pitches, reserving the Lydian tonic for the pedal and/or chordal zone. Melodies avoiding the Lydian tonic thereby utilize pitches #2–#7 of the fifth-stack: set class (024579). (Thinking in terms of scale, scale steps two through seven of Lydian scale will be present.) Conceptually, this technique manifests the role of the Lydian pedal as both tonic and "generator" of the scale, as its textural stratification places it in clear contrast to the pitches of the melodic zone. As a result, Zappa's Lydian melodies often seem to "hover" above their accompaniments. The missing Lydian tonic also contributes greatly to the tonal ambiguity of Zappa's melodies; without the tonic, in fact, only one semitone motion may occur in the melodic zone, that between the fourth and fifth scale degrees, while the potential tonicizing effect of scale-degree seven is checked.

Example 4.14 offers three brief examples of the melodic avoidance of the Lydian tonic in Zappa's music. For the purpose of space, only the melodies are given, along with an indication of the particular Lydian pedal in use. In Example 4.14a, from "Alien Orifice" (ECE 1981/1985), the A-Lydian pedal is followed by that of C-Lydian. Above each pedal, all scale degrees of their respective Lydian scales, excepting the Lydian tonic, are present. The same method is employed in Examples 4.14b and c. Clearly, the absent Lydian tonic does not result incidentally, as all melodies given have wide registral spans. For example, the flurry of notes that begins the excerpt from "RDNZL" (1973/1978b) (Example 4.14b) covers the registral space of an octave plus a fifth (F#4 to C#6). Additionally, every non-tonic scale degree of the A-Lydian scale is articulated in every registral position that it occupies within this span. Therefore, the complete diatonic scale space within this large range is musically articulated, with the conspicuous absence of A4 and A5. Similarly expansive Lydian spaces are covered in the final four measures of the interlude from "Montana" (ECE 1972/1973) (Example 4.14c). Over the culminating B-Lydian pedal, for example, the melody covers a two-octave range (C#4 to C#6). Like the flurry discussed in "RDNZL," each non-tonic scale degree appears in each of its registral positions within an octave and a fifth of this range (C#4 to G#5). It should be noted, however, that while examples of Lydian-tonic avoidance abound, they do not necessarily represent a *rule*. For example, the entirely Lydian "The Black Page #1" contains a lengthy segment (mm. 9–16) in the D-Lydian mode, wherein the Lydian tonic does in fact appear. However, it occurs only twice, while all remaining pitches within the scale appear at least ten times within this same segment. Therefore, it is perhaps better to think of Lydian-tonic avoidance as a strong *tendency* in Zappa's Lydian-mode music. At the very least, one can expect melodies paired with the Lydian pedal to treat the Lydian tonic frugally.

2. Mode II: Ionian.

Mode II of the Lydian system is Ionian, which occurs in tandem with a pedal on pitch #2 of the Lydian fifth-stack. Contrary to Russell's theory, which relegated Ionian to "horizontal" situations, Ionian is viewed here as a viable mode and, further, one potential "vertical" pairing with an accompanying major triad. Therefore, Ionian "mode" in this context can be distinguished with "major-key" functional tonality. However, examples of the Ionian mode in Zappa's music are rare. This fact alone provides strong evidence that Zappa considered Lydian to be the best scalar representative of major tonality. Nevertheless, Ionian has the greatest potential to challenge the primacy of Lydian, as it is the most similar to Lydian in its scalar structure. Most importantly, Ionian features Russell's mistrusted "Ionian fourth," the pitch most likely to suggest an opposing (Lydian) tonality. As will be shown in this section, and later in this chapter, the Ionian fourth/Lydian tonic is often a pitch of special interest in Zappa's music.

Example 4.15 provides the basic pitch structures of Zappa's Ionian-mode music (shown in C Ionian). As can be seen, chordal-zone materials in the Ionian mode are very similar to those of the Lydian mode, including both triadic and T7-cycle sonorities. As for tertian chords, the only notable divergence in Ionian is the lack of the 11th (i.e., the Ionian fourth) in the third stack. Of T7-cycle chords, particularly those of set class (027), the Ionian mode includes both sus-2 and sus-4 chords. The sus-4 chord, new to Ionian, is of particular interest, as its pitch content is identical to that of the Lydian sus-2 chord, consisting of pitches #1–#3 of the Lydian fifth-stack. Therefore, recalling Russell's notion that the Ionian scale suggests a tonic of its fourth scale degree (the Lydian tonic), this sus-4 chord can be conceptualized as a "first inversion" of the Lydian sus-2, removing the true tonic (here F) from its expected position at the bottom of the chord. The sus-2 chord in Ionian, however, features pitches #2–#4 of the Lydian fifth-stack. Given its sonic equivalence to the Lydian sus-2 chord, its inclusion in Ionian introduces a degree of ambiguity—and flexibility, as described by Zappa—into the chordal structures of the mode.

This consideration of the (027) sonorities in Ionian begs a return to the passage of "Uncle Meat" discussed in Example 4.8, which utilized a repeated D-sus-4 chord (D-G-A) in the chordal zone. While theoretically this sus-4 chord should indicate G as the tonic of the chord, Zappa in fact employed a D pedal in its earliest performances in the late 1960s, creating an Ionian-mode interpretation of the passage.[63] However, one will notice that the controversial Ionian fourth (in

[63] It should be noted that, in its first recorded performance, as heard on the album *Uncle Meat* (1969), the entire structure notated in Example 4.8 is transposed up a minor third. This transposition was created entirely from post-recording studio alteration. Live recordings from the time, as can be heard on *Beat the Boots I: The Ark* (1991),

the present case, G) is absent from the melody. Without the chordal zone, therefore, no pitches between the pedal and melody would be at odds with a Lydian scale (a point to be reconsidered later in this chapter).

Consider now the treatment of the Ionian fourth in three additional Ionian-mode excerpts, given in Example 4.16. The first of these (Example 4.16a) is the phrase from "Uncle Meat" that immediately follows Example 4.8; it features a sus-2 chord in the accompaniment above an Ionian pedal sharing the same pitch as the lowest note in the sus-2 chord (Eb). Listeners familiar with Zappa's practices would expect a melodic pairing of the Eb-Lydian collection with the Eb-sus-2 chord, and, for the majority of this tonal area, the pitches of the melody do not conflict with Eb Lydian. That is, similar to Example 4.8, the fourth scale degree of Eb Ionian (Ab) is withheld for some time, finally entering on the downbeat of the sixth measure of Example 4.16a. Examples 4.16b and c are corresponding phrases within the "waltz" section of "RDNZL" (ECE 1972/1978b).[64] As in the Ionian-mode excerpts from "Uncle Meat," The Ionian fourth is treated carefully in both Examples 4.16b and c. In Example 4.16b (the beginning of the waltz section), a C pedal, coupled with a C-major chord, is accompanied by a melody containing all scale degrees of C Ionian except the fourth (F). As it stands, it could potentially be heard as C Lydian with a missing Lydian fourth, F#. Example 4.16c occurs two phrases later, and constitutes primarily a T2 transposition of Example 4.16b, but with the melody in the final three measures recomposed. These recomposed measures now include the missing scale-degree four of the D-Ionian mode (a fact that confirms the original reading of Example 4.16b as C Ionian with a missing F). As will

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show that the piece was performed as indicated in Example 4.8. The bass in this performance is set as stacked fifths (D A E).

[64] The pedal/chordal zones transcribed here represent the piece circa 1974, when it was first performed in its "expanded" incarnation (see discussion in chapter 2).

be shown later in this chapter, the inclusion (or lack thereof) of the Ionian fourth will have implications for Zappa's later revisions of "RDNZL" and "Uncle Meat."

3. Mode III: Mixolydian.

The Mixolydian mode (Mode III) occurs along with a pedal on pitch #3 of the Lydian fifth-stack. After Lydian, Mixolydian is the most commonly used of the "major" modes of the Lydian system. Contrary to Russell's strict association of the Lydian scale with the major triad, Zappa often pairs the Mixolydian mode with a major triad. Due to this fact, and as will be detailed several sections below, Lydian and Mixolydian can often serve as competing major modes in Zappa's works. Our current focus is on situations in which the Mixolydian pedal is clearly behaving as tonic. Nevertheless, certain characteristics in the vertical use of Mixolydian reveal indebtedness to the overriding Lydian tonic.

Example 4.17 provides the relevant chords of Zappa's Mixolydian-mode pieces (as shown in G Mixolydian). Similar to previously discussed modes, both triadic and T7-cyclic chords are present. However, Mixolydian's tertian sonorities are limited to the major triad, as Mixolydian has no seventh-chord representative. This fact is quite significant, as a seventh chord built from a Mixolydian pedal would provide a chord type as yet unaccounted for: the dominant-seventh chord. As discussed above, George Russell had located the "seventh-chord family" on scale-degree two (Mode II) of the Lydian mode. While our Mode III is essentially the same mode as Russell's Mode II (both being located on the pitch two perfect fifths away from the Lydian tonic), the dominant-seventh sonority is prohibited in this theory. Stated plainly, dominant-seventh chords do not occur within the Lydian system—or, for that matter, Zappa's diatonic music, wherein the presence of the dominant-seventh chord should be taken as a sure indication of the employment of the "horizontal" major-scale tonal system (see, for example, the discussion of Example 4.9). Within the Lydian system, this lack can be partly attributed to the tendencies of resolution expected of the dominant-seventh. By avoiding this chord above the Mixolydian pedal, the controlling pedal's status as local tonic is maintained. For musical environments in which the Lydian mode functions similarly to a "key" (to be discussed later), this potential dominant-seventh chord would have resolution tendencies towards the fifth scale degree of the mode, thereby challenging the supremacy of the Lydian tonic.

Various T7-cyclic chords are available in the Mixolydian mode (shown in Example 4.17). The Mixolydian sus-2 chord is built from pitches #3–#5 of the stack. As will be discussed below, Mixolydian is the last mode of the Lydian system from which a sus-2 chord may be formed above the pedal. The main theme of "Little House I Used to Live In/The Return of the Hunchback Duke" (ECE 1968/1970a) demonstrates the use of the sus-2 chord in the Mixolydian mode (Example 4.18).[65] Another potential T7-cyclic chord in Mixolydian is the sus-4 chord, which employs pitches #2–#4 of the Lydian fifth-stack. This chord is utilized extensively in the verses of the song "Montana."

The most characteristic T7-cyclic chord in Mixolydian is the "quartal" chord, consisting of a stack of two perfect fourths (see Example 4.17).[66] This sonority is built from pitches #1–#3 of the Lydian fifth-stack; thus, as with the Ionian sus-4, the (027) set created by this T5 cycle can also be viewed as an inverted form of the trademark Lydian quintal/sus-2 chord (i.e., F-C-G

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[65] Zappa's titling of this music is somewhat inconsistent. It originally appeared on the album *Burnt Weeny Sandwich* as a section of the multi-part "Little House I Used to Live In." Live, and later on the album *You Can't Do That On Stage Anymore* Vol. 5, the title "Return of the Hunchback Duke," or simply "The Duke," was employed.

[66] The use of quartal chords is also found in some modal jazz. See, for example, Paul Rinzler, "The Quartal and Pentatonic Harmony of McCoy Tyner," *Annual Review of Jazz Studies* 10 (1999): 35–87. The importance of T5 cycles to the music of Herbie Hancock has been discussed in Keith Waters, "Modes, Scales, Functional Harmony and Nonfunctional Harmony in the Compositions of Herbie Hancock," *Journal of Music Theory* 49/2 (2005): 333–357.

becomes G-C-F). Given the preference for perfect fifths within the Lydian theory, a sense of "imperfection" can be attributed to T5 structures such as the quartal chord, as they theoretically imply a tonic above the pedal. Through the use of the quartal chord, then, the Mixolydian mode shows itself to be indebted to the controlling Lydian tonic. Quartal chords are often used by Zappa in the accompaniments of his Mixolydian mode guitar solos. Examples include the solos for "Yo' Mama" (ECE 1977/1979c)—which also includes a Mixolydian "composed" section based on the same quartal chord—and "Zoot Allures" circa 1981–88 (an example to which we will return below). Example 4.19, the main theme from "Pound for Brown" (ECE 1958/1969a), manifests the quartal structure within its ostinato accompaniment. This phrase is particularly saturated with T7/T5 cycles, not only in the F-Bb-Eb stacked fourths of the ostinato but also in the various ic 5 intervals of the melody. As shown by brackets on the example, all pitches of the melody are involved in at least one perfect fifth or perfect fourth. Additionally, the opening melodic stack of fourths (C-F-Bb) is retrograded by the final three pitches of the theme (Bb-F-C), creating a quasi-palindrome. Due to the saturation by T7/T5 cycles, Example 4.19 may not "sound" Mixolydian in the traditional sense; rather, the mode results from the T5 structures of the ostinato. That is, in the same manner in which Lydian-mode structures seems to emerge naturally from T7 cycles, the presence of two perfect fourths at the bottom of the texture in Example 4.19 foreshadows the use of the Mixolydian mode.[67]

The various T7-cyclic chords of Mixolydian lead us to the following general rule regarding the cyclic employment of perfect fifths/fourths in the pedal/chordal zones: such cycles are typically limited to pitches #1–#5 of the Lydian fifth-stack, thereby barring the use of the leading tones for such purposes. This rule is demonstrated in the main theme of "One Man, One

[67] Additional evidence for this point is revealed in the music immediately following Example 4.19, wherein the opening F-Bb fourth in the ostinato is altered to a perfect fifth F-C. This allows for a brief melodic utilization of the F-Lydian scale before returning to the primary Eb-Lydian collection that arose from the quartal structure.

Vote" (SYN 1985), shown in Example 4.20. This B-Mixolydian theme is accompanied throughout by a four-bar ostinato, which is comprised of several layers. The bottom layer, a more "melodic" double-bass ostinato, emphasizes a quartal structure (B-E-A) while the upper, static layer forms the quintal/sus-2 sonority (B-F#-C#). Thus, two of the characteristic Mixolydian (027) chords are here employed in tandem. Example 4.21 demonstrates how these two chords relate inversionally within the Lydian system. Shown within the A-Lydian system (that used in "One Man, One Vote"), the Mixolydian tonic B generates the quintal/sus-2 chord upwards in perfect fifths, while also reaching downwards by perfect fifths towards the Lydian tonic to create the quartal chord. Given the simultaneous utilization of these two cyclic structures, the accompaniment zone of "One Man/One Vote" is comprised primarily of pitches #1–#5 of the Lydian fifth-stack, with the addition of the leading tone G# consistently leading by semitone to the tonic of the A-Lydian system.

4. Mode IV: Dorian.

Mode IV (Dorian) is by far the most significant non-Lydian mode within the Lydian system, appearing only less often than Lydian in Zappa's music. While Lydian represents the overriding "major" tonality of the Lydian system, Dorian similarly functions as the characteristic "minor" tonality in the system. Therefore, the relationship between Lydian and Dorian can be fruitfully compared to that traditionally attributed to Ionian and Aeolian in the major-key system. That is, Lydian and Dorian are, in a sense, polar opposites within the modal system. One manifestation of this binary relationship can be seen by hearkening back to our discussion of the Lydian mode, particularly the concert-opening guitar-solo vamp used by Zappa circa 1978-79: a sustained E pedal that was customarily accompanied by an E-Lydian solo. On Halloween night

1978, Zappa modified the opening solo by substituting an A pedal for the standard pedal on E and accompanying this A pedal with a Dorian improvisation.[68] Given the occasion of Halloween, therefore, the characteristic minor tonality of Dorian was deemed a more appropriate concert introduction than the typical major tonality of Lydian.

Considering our general tendency to conceptualize all non-Lydian events within a Lydian framework, we can also see Dorian as a strong analog to the Lydian tonic. In terms of compositional usage, one parallel between Dorian and Lydian is apparent by comparing the earlier-discussed Example 4.9, from "Holiday in Berlin," with Example 4.22, from "The Grand Wazoo" (ECE 1972c). In "Holiday in Berlin," it was observed that the Ionian/major scale was employed in tandem with functional progressions, whereas the Lydian scale was substituted once the accompaniment was reduced to a single pedal. In "The Grand Wazoo," a similar distinction can be made between the contexts in which Aeolian or Dorian are employed. This piece is comprised of several short themes, of which Example 4.22 provides Theme 4 and the beginning of Theme 5—themes separated by a brief guitar solo. As in "Holiday in Berlin," all of these adjacent themes have the same tonic pitch (in this case, B). Theme 4 employs the familiar rock progression i-bVI-bVII, clearly indicating the Aeolian mode. When the accompaniment is subsequently modified to a simple pedal on B for both the guitar solo and Theme 5, however, Zappa foregoes the use of the Aeolian mode in favor of Dorian. Therefore, similar to the Lydian/major-key dichotomy, Dorian finds its home in characteristic vertical/static contexts.[69]

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[68] This solo was released under the title "Ancient Armaments." Currently, this piece can be found on the DVD-A *Halloween* (2003). It was originally released as the B-side to the single "I Don't Wanna Get Drafted" (1980).

[69] Notable examples of the Dorian mode being employed over static pedals, while too numerous to cite exhaustively, include the second theme of "Pound for a Brown" and the solos of "Montana," "The Torture Never Stops," and "Drowning Witch." A particularly extensive melodic use of the Dorian scale (i.e., where a pedal is not necessary for modal identification) is found in the piece "Big Swifty," where the first twenty nine measures feature an unaccompanied E-Dorian theme.

Structurally, several factors contribute to the high rank of Dorian within the Lydian system. Considering its scalar structure, Dorian is the most similar to Lydian of the potential minor modes of the diatonic scale. However, better justification is found by comparing the tertian structure of Dorian and Lydian. Example 4.23 represents both modes as third-stacks. As can be seen, both Lydian and Dorian structures can be generated by the alternating interval cycle 3/4, with Lydian beginning with a major third and Dorian beginning with a minor third. Accordingly, all adjacent three-note segments of the Lydian and Dorian third-stacks produce consonant triads.[70] Further, while Lydian can be viewed as consisting of three interlocking major triads (as described above), Dorian is constructed on three interlocking minor triads. Example 4.24 provides additional justification for hearing Dorian as an analogue to Lydian, evidence which engages the role of the Dorian tonic (here D) as the axis of symmetry within the Lydian fifth-stack (as shown in Example 4.24a). Though traditional tonal theory has found little significance in the axial pitch of the diatonic set, Example 4.24b demonstrates how this inversional center defines an additional point of relation between the Lydian and Dorian third-stacks. As shown, Lydian and Dorian third-stacks within the same Lydian system (here F Lydian and D Dorian) are pitch-space inversions of one another, with the highest pitch of the Lydian third-stack mapping onto the lowest pitch of the Dorian third-stack, and so on. Though a somewhat more abstract explanation, this inversional relationship owes much to the aural similarity between Lydian and Dorian.[71]

Example 4.25 provides the characteristic tonal structures of the Dorian mode in Zappa's music. Not surprisingly, given the high degree of tertian similarity between Lydian and Dorian,

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[70] This structure is not possible in any of the remaining diatonic modes, as all will feature a diminished triad within their third-stack.

[71] In Chapter 5, we will see a more direct musical manifestation of this inversional relationship.

the Dorian mode is most often represented by a triadic sonority, such as a minor triad or seventh chord. Because the Dorian pedal occurs higher up the Lydian fifth-stack, on pitch #4, its T7-cycle sonorities are somewhat constrained. Significantly, Dorian is the first mode yet encountered in which sus-2 chords constructed from the pedal are absent. This constraint accrues because a potential Dorian sus-2 chord would feature one of the "leading tones" of the Lydian system. For example, in the F-Lydian system, a Dorian sus-2 would include the pitches (D-A-E), thereby incorporating E, the first leading tone of the F-Lydian system. As detailed above, T7-cycles in the accompaniment (pedal/chordal zones or ostinati) tend to be reserved for pitches #1–#5 of the Lydian fifth-stack, thereby barring the relatively unstable leading tones from providing harmonic support.

As evidence of the above-stated restriction on Dorian sus-2 chords, consider the opening of the piece "The Idiot Bastard Son" (ECE 1967/1968a) (Example 4.26). Given here is the recurring "motto" of the piece as well as the first phrase. In the melody, the A-Dorian mode is clearly established.[72] The opening motto, for example, repeats the tonic A several times, decorating it with the minor third C and minor seventh G. The following phrase features a stepwise diatonic sequence initialized melodically on the tonic A: one which subsequently terminates on an A-minor triad. Returning to the opening melodic motto, one finds exclusively the employment of sus-2 chords as harmonic support. However, only the sus-2 chord set to the tonic A is harmonically significant. (For the intervening sus-2 chords, parallel voice-leading (planing) usurps tonal considerations; observe in particular that the pitch C is harmonized by a

[72] Of course, typically Zappa's melodies do not clearly suggest any particular mode. This piece, therefore, represents a slight aberration in comparison to most works discussed in this chapter.

sus-2 chord including the pitch F, a note that does not belong to the A-Dorian scale).[73] As shown, the opening tonic A is set to a D sus-2 chord rather than one constructed from the tonic. Therefore, considering the diatonic collection in use, the opening motto hints at the D Mixolydian mode. The use of this "false" pedal is necessitated by the fact that Mixolydian is the last pedal over which a sus-2 may occur in the Lydian system.[74]

Although the Dorian mode may be limited in terms of T7 cycles above the pedal, it is richer than all the previously discussed modes in terms of T5 cycles. Therefore, the quartal (027) chord found in Mixolydian is also present in Dorian, allowing a degree of modal flexibility/ambiguity. This quartal structure is employed in the Dorian guitar solo to "The Mammy Anthem" (ECE 1982/1984c). The quartal (027) can also be expanded in the Dorian mode, resulting in the final chord shown in Example 4.25. Specifically, the Dorian mode allows for one additional perfect-fourth interval in the chord stack. In relation to the Lydian fifth-stack, one should view this fourth as expanding pitches #1–#3 of the Mixolydian quartal chord to pitches #1–#4. The extended quartal chord of the Dorian mode may also gain an appended major third above the highest note of the fourth stack. This particular sonority is probably the most recognizable of all quartal chords, being known in jazz circles as the "So What" chord (hereafter SWC), in reference to its first usage by pianist Bill Evans on the track "So What" from Miles Davis's *Kind of Blue* album.[75] Similar to Zappa's employment of the chord, the SWC was exploited in "So What" within the Dorian mode, whereby the lowest pitch of the chord is treated

[73] The extensive use of sus-2 chords merely for their sonic qualities is also occasionally found in Zappa's music. Often, though, the first chord in such a sequence has tonal implications.

[74] In the original instrumental version of "The Idiot Bastard Son" (as heard on *Lumpy Money* (2009)), this D sus-2 chord is repeated several times before the motto proper above an emphatic D pedal.

[75] Mark Levine, *The Jazz Piano Book* (Petaluma, California: Sher Music Co., 1989).

as the modal tonic. The SWC utilizes pitches #1–#5 of the Lydian fifth-stack (i.e., all except the leading tones).

An extensive employment of the SWC is found in "Zoot Allures" (ECE 1975/1976), a piece which also engages in an interaction with the Mixolydian quartal chord. The primary motive, as shown in the first two measures of Example 4.27, is punctuated at its end by the SWC. This motive is employed at the outset of the piece as well at the transition into the guitar solo. Example 4.27 provides two separate versions of the latter context, the first (a) is representative Zappa's treatment in concert circa 1975–76 and the second (b) of live versions from 1981–88.[76] In Example 4.27a, the arrival of the SWC, built here from the bass D#, heralds an extended solo in Dorian over a D# pedal, thereby confirming the Dorian implications of the SWC. Example 4.27b shows an expansion of the transition in Ex. 4.27a.[77] In this version, rather than launching into a D#-Dorian improvisation after the arrival of the D#-SWC, the chord is transposed up a half step to a new SWC, now implying E Dorian. Significantly, however, the following guitar solo is *not* in E Dorian, as Zappa instead shifts the pedal to that of A Mixolydian. E Dorian and A Mixolydian, of course, reside within the same Lydian system (G), a fact underlined through the utilization of the characteristic *Mixolydian* quartal chord (027) within the chordal zone. In order to enact this harmonic shift, all that is required—besides the change in pedal—is to excise the lowest note (E) of the previous SWC. Otherwise, the pitch content of the SWC is retained in A Mixolydian, an exploitation of the shared potential T5 cycles in Mixolydian and Dorian.

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[76] Not included in this discussion is the original album version of the piece as heard on the album *Zoot Allures* (1976). In that version, a new transition was interpolated prior to the solo.

[77] On the album *You Can't Do That on Stage Anymore Vol.3*, Zappa cleverly edits between a performance from Osaka, 1976, and one from 1982 at the precise moment of the shared SWC.

5. Mode V: Aeolian.

In Example 4.6, a question mark was attached to Aeolian, the final mode of the Lydian system. In part, this question mark reflects the fact that Aeolian is seldom found in Zappa's diatonic music. However, the tenuous role of the Aeolian mode within the Lydian system can be explained by purely structural factors. Let us consider, in reference to the Lydian system, the triadic and T7-cyclic structures that might occur above the Aeolian pedal. Example 4.28 provides both a triad and sus-2 chord in Aeolian. As shown, both chords prominently feature the "leading tones" of the Lydian fifth-stack. As for the sus-2 chord, which contains both leading tones, we have already stated the preference to bar these relatively unstable pitches from T7-cyclic sonorities. On a more fundamental level, the Aeolian pedal is unable to receive consonant support from a fifth that is stable within the Lydian system. Therefore, the Aeolian triad, which is supported by pitch #6 of the Lydian fifth-stack, is heard as relatively dissonant within the Lydian system. This represents a marked divergence from the view of the Aeolian triad within traditional tonal theory, one which results from the different leading tones of the Lydian system. Ramon Fuller, for example, has explained the importance of Ionian and Aeolian in tonal music in reference to the leading tones of the major scale, which constitute the dissonant tritone interval.[78] Therefore, within the white-note collection, the Ionian and Aeolian triads (CM and Am) are the only triads within the diatonic set to avoid the unstable leading tones F and B. In the Lydian system, only the Lydian and Dorian triads avoid the leading tones, as do the allowed T7-cyclic chords enumerated throughout this section. As for the remaining permitted triads (of Ionian and Mixolydian), neither feature the leading tones as their consonant fifth. Therefore, the harmonic treatment of the leading tones of the Lydian scale—though of less charge than those in major-

[78] Ramon Fuller, "A Structuralist Approach to the Diatonic Scale," *Journal of Music Theory* 19/2 (1975): 201.

key tonality—holds important repercussions for chordal structures, and therefore for modal status.

Another matter that may account for Aeolian's absence in Zappa's music is affect: specifically the sense of brightness or darkness of the various diatonic modes. In jazz theorist Bert Ligon's discussion of the modes, as one representative example, he classifies the seven diatonic modes in order of brightness and darkness. As shown in Example 4.29, the ordering of modes from bright to dark is in accordance with the order of modes within the Lydian system (though Phrygian and Locrian are not part of the Lydian system). Hence, Lydian is judged the brightest of all the modes and, of the five modes of the Lydian system, Aeolian is considered the darkest. Considering these rankings, Zappa's modal choices reveal a preference for the brighter modes. Of his four most often employed modes (Lydian, Ionian, Mixolydian, Dorian) only one is a "minor" mode, and that mode, Dorian, is the "brightest" of the minor modes.

The general brightness of Zappa's modal choices highlights the lack of "tragedy" expressed by his music.[79] Traditional musical signifiers of tragedy—for example the "lament progression" (i-bVII-bVI-V)—often explicitly exploit the Aeolian mode's potential. Significantly, the only piece in which Zappa extensively utilizes the Aeolian mode clearly evokes the tragic. This piece, "Outrage at Valdez" (SYN/ACE 1990/1993b), was originally composed on the Synclavier as part of the score of the documentary *Alaska: Outrage at Valdez,* which details the resulting devastation from the Exxon Valdez oil spill in 1989.[80]

[79] For a discussion of the tragic implication of the minor mode and, specifically, its narrower range of meaning in comparison to the major mode, see Robert Hatten, *Musical Meaning in Beethoven: Markedness, Correlation, and Interpretation* (Bloomington, IN: Indiana Univ. Press, 1994): 36 ff.

[80] This documentary was produced by the Cousteau Society in 1990. Unfortunately, only twenty five seconds of the piece were used in the actual documentary. One can find a complete ACE performance on the album *The Yellow Shark* (1993).

While the general use of Aeolian in “Outrage at Valdez” is fitting to the depiction of its extra-musical subject matter, the piece also manifests the tenuous nature of the Aeolian mode in relation to the Lydian system. The form of the piece is a quasi-rondo, similar to that seen in “Night School.” While no rondo “theme” as such exists, an (A-B-A'-C-A") structure is articulated by the periodic return of an ostinato pattern in F Aeolian that accompanies the improvisatory melody. This rondo “theme area,” occurring at mm. 2–15, 22–27, and 36–end, is interrupted by Aeolian “episodes” in Eb and Gb, respectively. Example 4.30 provides a reduction of the music from mm. 2–4, which contains the basic elements of the ostinato. These include a pedal on F, a repeating arpeggiated pattern in the celesta, and a harp figure featuring the perfect fourth F-Bb. The modal analysis of F Aeolian is based on the strongly emphasized F pedal. The other ostinato layers, however, slightly contradict the F-Aeolian interpretation. The perfect fourth of the harp suggests Bb as the tonic, and thereby the Dorian mode, given the emphasis on Bb (in addition to Hindemith’s rule that the top note of a perfect fourth be interpreted as tonic). The celesta part, as well, appears to support a Bb tonic, as it arpeggiates what can be easily interpreted as a complete Bb-Dorian extended tertian structure (Bb-Db-F-Ab-C-Eb), with the thirteenth (G) being provided by the clarinet melody. Significantly, the first three eighth notes of the celesta ostinato, the argeggiated Bb-minor triad, are not actually audible in the released recording of the piece (on *The Yellow Shark* album). (Whether Zappa decided to excise these pitches from the performance or whether they were merely mixed low is unknown. The remainder of the celesta ostinato is clearly heard, so it is more likely that the former scenario is the case.) Without the first three pitches, the celesta ostinato can be said to support the F pedal; instead of arpeggiating a Bb-minor extended tertian chord, the celesta part merely presents a broken F-minor-seventh chord. Significantly, however, the withholding of the opening three celesta pitches also calls into question the Aeolian interpretation, as the pitch Db (the flat sixth) is no longer present in the accompaniment. This leaves the melody with the task of confirming or contradicting the Aeolian mode. The flat sixth Db does in fact appear in the melody, but rarely; it occurs only once in the A section, twice in the A' section, and zero times in the entire 23-measure A" section.[81]

Besides the ostinato elements that potentially conflict with F Aeolian, other events occur throughout the piece which threaten to overtake the Aeolian pedal. But whereas the celesta and harp ostinati suggested Bb Dorian, these moments hint at Db Lydian: the tonic of the Lydian system in which F Aeolian resides. Specifically, at mm. 13, 15, 24, 40, 42, and 44, the pitches Db and Ab are superimposed over the familiar ostinato texture in F Aeolian. The Db, in particular, occurs *below* the F pedal in pitch space (usually being played by the cello or tuba). These Lydian hints become more pronounced in the A" section; not only do they occur more often, but the Lydian pedal is articulated simultaneously with the Aeolian pedal and held for the same duration (eight eighth notes).

Towards the close of the piece, immediately following the last melodic pitch, the non-Aeolian implications at play throughout are finally realized. As shown in Example 4.31, the "overthrow" of Aeolian occurs in stages. First, the opening three pitches of the celesta ostinato (Bb-Db-F, reinforced now by the piano) become clearly audible; thereby, the Dorian mode begins to assert itself more forcefully than previously. Second, the Aeolian pedal is conclusively abandoned at m. 59 in favor of the Dorian pedal Bb. Finally, in the same measure, the Lydian pedal Db appears in three different registers in the brass instruments, persisting past the Bb pedal of m. 59 and providing a clear Lydian close to the piece. This passage functions as a gradual

[81] The reader should note that the absent pitch (Db) is the Lydian tonic of the system, a pitch treated with care in the melodies of both Lydian and Ionian modes. This avoidance of the Lydian tonic remains a curious feature of Zappa's music.

"washing away" of the tragedy of the piece, achieved as the Aeolian mode gives way to the "brighter" Dorian mode and finally the "brightest" mode: the Lydian tonic.

6. Pentatonic scales.

Beyond the complete diatonic modes, pentatonicism is also encountered fairly often in Zappa's music. As is commonly known, the pentatonic set (02479) can be generated by a five-note cycle of fifths. Given the centrality of the T7 cycle to the Lydian system, distinct anhemitonic pentatonic scales can be viewed as five-note segments of the seven-note Lydian fifth-stack. The results are provided in Example 4.32, which identifies three distinct pentatonic scales that correspond to the three possible five-note segments of the fifth-stack. In terms of pc content, these scales usually differ only by one or two pitches if occurring within the same Lydian system (those of Example 4.32 are all shown within the F-Lydian system). Two of these, the "minor 1" and "major" pentatonic, produced from segments one and three respectively, are well known. That produced from segment two, the "minor 2" pentatonic, will be less familiar to readers, but is indeed a clear pentatonic variety in Zappa's music.

a. Segment 1: Minor 1.

In most pedagogical explanations of the pentatonic scales in tonal music, the major and minor pentatonic scales are described in relation to the Ionian and Aeolian modes. Major pentatonic is thereby described as containing scale-degrees 1-2-3-5-6 of the major scale, while minor pentatonic is said to include scale-degrees 1-3-4-5-7 of the natural minor scale. It is often observed that, if these major and minor scales are relatives (e.g., C major and A minor), the pc content of both pentatonic scales is identical. Within the Lydian theory, such an explanation is not asserted. As mentioned above, none of the three pentatonic scales in a single Lydian system have the same pc content. More importantly, none of the pentatonic scales function as segments of the Ionian and Aeolian modes.

Minor-1 pentatonic, whose pitch content derives from the first five-note segment of a Lydian system, is identical to the traditional "minor" pentatonic scale. As indicated on Example 4.32, the tonic of this scale is the Dorian pedal. Therefore, the minor-1 pentatonic should be viewed as a scalar segment of the Dorian mode rather than the Aeolian mode. Zappa's music confirms this contention conclusively, as minor-1 pentatonic is often expanded to include the remaining pitches of the Dorian mode. This tendency is most prevalent in his extended Dorian-mode guitar improvisations, wherein the pitch collection of the minor-1 pentatonic scale often constitutes the majority of the solo, while occasional pitch expansions are made by including one or both of the remaining Dorian pitches (scale-degrees 2 and 6).

The theme of "King Kong" (ECE 1967/1968b) demonstrates how the minor-1 pentatonic scale and the Dorian mode may interact within a piece (see Example 4.33). This theme, accompanied throughout by an Eb pedal and an Eb-sus4 chord, utilizes both the Eb-minor pentatonic scale (the "black notes" on the keyboard) and the Eb-Dorian mode (which adds the "white notes" F and C). In order to elucidate certain procedures, it will be necessary to distinguish between musical segments residing in diatonic-space or pentatonic-space (hereafter, *d-space* and *p-space*).[82] D-space includes diatonic steps the size of one or two semitones, whereas the steps of p-space are either two or three semitones in size.[83] The first four measures

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[82] These terms are taken from David Carson Berry, "The Structural Roles of Pentatonicism in Tin Pan Alley Songs," paper presented at the annual conference of the Society of Music Theory, Madison, WI, November 2003.

[83] Ibid., 2.

of the melody, for example, appear to feature an "inexact" sequence. That is, the sequenced idea, presented in the first measure, is never replicated precisely in its <-2, -2, -3> form in the following three measures. If viewed through the prism of p-space and d-space, however, it becomes apparent that the first two measures occur within p-space while mm. 3–4 shift to d-space. Though the first two measures appear to include intervals of the third, the sequenced idea is in fact a descending stepwise scale in p-space, which allows for steps of three semitones. Measure 4 demonstrates the effect upon the sequenced idea once it is converted to d-space, as the descending steps now are either one or two semitones in size. The following music continues the trend of sequential motion within d-space and p-space. The majority of mm. 5–11 takes place in p-space, yet the basic idea of this sequence, presented at m. 5, is the interval of a third in d-space. Once the shift to p-space occurs at m. 6, the most of sequenced thirds (bracketed on the example) appear as perfect fourths in traditional d-space; viewing them instead as "pentatonic thirds" allows us to account for all the ic 5 intervals as well as the one ic 4 Gb-Bb at m. 8.[84] Finally, from mm. 13–15, a new descending sequence emerges: one existing firmly within d-space. In sum, this example demonstrates a clear interdependence between the minor-1 pentatonic scale and the Dorian collection.

b. Segment 2: Minor 2.

The second five-note segment of the Lydian system produces our next pentatonic scale, the minor-2 pentatonic. As Example 4.32 shows, this scale likewise has the Dorian pedal as its tonic pitch, and is thereby viewed as a segment of the Dorian mode. Unlike minor-1 pentatonic, minor-2 does not contain a minor third above the tonic, as it substitutes scale-degree 2 for the

[84] Another clear example of sequencing within the minor-1 pentatonic mode occurs at (0:30–0:33) of the piece "Zombie Woof," a piece that heavily features the minor-1 pentatonic scale.

minor third of minor-1; hence, minor-2 relies on other musical factors to supply the minor-mode identifier. Example 4.34, the main theme from Zappa's score to the movie *Run Home Slow* (ECE 1963, film released 1965), offers an early example of this pentatonic variety. The ostinato accompanying the minor-2 pentatonic theme heavily features T5 cycles above the tonic B, specifically the quartal structure (B-E-A), in which the central E is decorated by upper and lower neighbors (including the minor third of the B-Dorian scale (D)). This T5 cycle highlights an important structural feature of minor-2 pentatonic. As Example 4.35 shows, the minor-2 pentatonic scale, in its scalar ordering, contains three discrete ic 2 dyads related in succession by T5. In relation to "Run Home Slow," the initial pitches of each of these dyads are the same notes set as a quartal structure in the ostinato (B-E-A). Two of the T5-related dyads of this minor-1 pentatonic scale, B-C# and E-F# are emphasized in the melody (see brackets). Further, the opening three pitches of the melody, E-F#-A, are answered by their T7/T5 counterpart B-C#-E at mm. 4–8.

A much later and even more extensive employment of the minor-2 pentatonic is found in the piece "G-Spot Tornado" (SYN/ACE 1986b), coincidentally (?) also in B-minor-2 pentatonic. As in "Run Home Slow," the minor-2 pentatonic collection resides in the melodic line of Example 4.36 (only m. 1 is in minor-1 pentatonic), while the accompaniment occasionally includes the minor third of the Dorian mode. The basic idea of the piece, presented at m. 2 and repeated and varied throughout the theme (see brackets), features the entire B-minor-2 collection, covering the single octave B4 to B5. Also like "Run Home Slow," the accompaniment to the theme places emphasis on the T5 structure of the minor-2 scale, particularly the quartal collection B-E-A (see circled pitches on the example).

The T7/T5 cyclic structure of the minor-2 pentatonic scale is exploited further in the B section of the piece, which functions as a kind of "solo" within the larger work.[85] As shown at Ex. 4.37a, the beginning of the "solo," the melody is tracked in parallel by an additional voice a perfect fourth below. These parallel fourths are made possible due to the T5 structure of the scale. As the solo progresses, the Dorian pitch G# is integrated into the parallel fourths of the melody (see Example 4.37a). Relative to the overall Lydian system in which B-minor-2 pentatonic resides (D Lydian), the added G# expands the 5-note T7 cycle that contains minor-2 pentatonic (i.e., segment two of the fifth-stack) to a 6-note segment of the Lydian scale, comprising pitches #2–#7 of the Lydian fifth-stack. It is this collection that predominates in the B section of the piece, being subjected to various T7/T5-cycles. Example 4.37b shows the culmination of these T7/T5 cycles, occurring at the climax of the B section.[86] As indicated, a six-note T5 cycle is unfolded in the melody, comprised of pitches #2–#7 of the D-Lydian fifth-stack.

c. Segment 3: Major.

Compared to the two minor-pentatonic forms, the major pentatonic is less commonly encountered in Zappa's instrumental music. The major pentatonic is generated from the third five-note segment of the Lydian system (see Example 4.32). As shown, the tonic of the major pentatonic is determined to be the Mixolydian pedal, and conclusively *not* the Ionian (as is traditionally taught) or the Lydian pedal. Therefore, if one were to encounter a passage fully

[85] The melody of this section was likely improvised by Zappa on the Synclavier keyboard. See Jeff Spurrier, "Zappa on Jazz From Hell," *Music & Sound Output*, March 1987.

[86] Without a score, the rhythm as I have transcribed it in Example 4.37b can only be considered a guess. Significantly, this passage presents the only "rhythmic dissonance" of the B section.

comprised of the major pentatonic collection, one would expect the pedal/tonic to be Mixolydian.

Another possible manifestation of the major pentatonic scale—one encountered much more often in Zappa's music—is as the pitch collection of the melodic zone in Lydian contexts. This description fits the employment of the major pentatonic in the main theme of the ECE version of "Dupree's Paradise" (1973/1988c) (see Example 4.38). The pedal utilized here is the Lydian pedal B, while the accompaniment formations above this pedal suggest an outgrowth of T7-cycles from the pedal, specifically the repeated Bs of the bass and the F#-major chord of the piano (i.e., E-B-F#-C#). The melody completes the E-Lydian scale, being comprised of the major pentatonic segment of the Lydian system, pitches #3–#7 of the Lydian fifth-stack. Here, the pentatonic scale is in the form of the "black notes" on the keyboard. The construction of the melody, with its emphasis of the perfect fourth C#-F#, lends itself to a major pentatonic interpretation with a Mixolydian tonic (F#). Without the pedal on E, in fact, most listeners would likely hear F# as the tonic of this theme.

C. Interaction between modes.

In this section, we begin to explore the ways in which the concept of Lydian system may manifest itself beyond the sonorities and pitch structures of local static modal states. That is, while in the preceding discussion the Lydian tonic was shown to retain influence over non-Lydian modes due to somewhat abstract structural properties, here we will observe how the Lydian tonic scale—along with its derived modal offspring—interact in very salient ways on the musical surface. Specifically, I will be concerned with two issues of importance in Zappa's diatonic music: (1) *pedal substitution*, whereby the various pedals of the Lydian system are treated as interchangeable; and (2) *progressions*, both between the modes of a single Lydian system and between those of different Lydian systems.

1. Pedal substitution.

In Section III.A above, the fundamental importance of the pedal in determining modal orientation was asserted. Because Zappa's diatonic melodies and chords are often tonally ambiguous, the pedal acts as both *root representative* of the given chord and as *tonic representative* of the present diatonic melody. Such ambiguity also theoretically allows for any of the pitches of the given diatonic scale to be set as the pedal. However, within the Lydian theory, only five pitches within the Lydian system are truly viable pedals, namely the first five notes of the Lydian fifth-stack. These pedals produce the modes of the Lydian system discussed above: Lydian, Ionian, Mixolydian, Dorian, and Aeolian. As will be documented throughout this section, Zappa exploits the variety of pedals afforded by the Lydian system with the technique of *pedal substitution*. This practice involves the substitution of one pedal within the given Lydian system for another pedal of the system, thereby altering one's modal perception of the melody. As will be shown, this method is most often employed in thematic restatements, wherein a melody initially set to one pedal of the Lydian system is recast above a different pedal.

As an initial demonstration of pedal substitution at work, consider the treatment of the primary melodic motive of the song "Montana" (ECE 1972/1973). Example 4.39 provides three versions of this motive: that occurring (1) at the introduction to the song (a); (2) after the "verse" and immediately preceding the guitar solo (b); and (3) at the close of the song following a return to the verse (c). In its first appearance (Ex. 4.39a), the motive is accompanied by a pedal on A, creating an initial modal impression of A Lydian. The following verse of the song is primarily in

B Mixolydian, and within this Mixolydian environment (i.e., above the Mixolydian pedal B), the second, varied statement of the motive occurs (Example 4.39b). For the final appearance of the theme, the main motive (Ex. 4.39c) is set alternatively to pedals on F# and B (two measures each and repeating through the fade out); the F# pedal creates a Dorian modal interpretation of the theme while the B pedal returns the music to B Mixolydian. Because this final appearance of the motive takes place in a corresponding formal position to Ex. 4.39b (after the verse), do we hear the F# pedal as subservient to the overriding B-Mixolydian mode of the verse, or do we truly hear the F# pedal as providing a separate modal environment for the melody? In fact, within the Lydian theory, these readings are not mutually exclusive. However, as we have yet to discuss possible "progressions" that can occur within a Lydian system, I will not consider the first interpretation at this time.[87] On the other hand, the interpretation that regards the F# pedal as a true modal shift to Dorian does find support throughout the piece. The guitar solo that followed Ex. 4.39b, for example, was entirely in F# Dorian, while the beginning of the post-solo section of the piece likewise began in F# Dorian. Therefore, Example 4.39c can be seen as a recollection of two of the most important modes of the piece. More generally, this analysis manifests the central premise of pedal substitution, specifically the employment of various pedals within a Lydian system (here A Lydian) to alter one's modal reading of the same melody.

One particularly significant pedal substitution with regard to the Lydian theory—especially in light of Russell's comments—is that between Ionian and Lydian pedals. To understand the details of this substitution, we need to return to the two pieces discussed in Section B in connection to the Ionian mode: "Uncle Meat" (ECE 1968/1969a) and "RDNZL" (ECE 1972/1978b). Therein, it was observed that the controversial fourth of the Ionian mode (i.e., the Lydian tonic) was treated with care in both of these pieces. Two phrases in particular,

[87] This particular progression will be discussed in detail in the following section of this chapter.

those shown in Examples 4.8 (from "Uncle Meat") and 4.16b (from "RDNZL"), completely avoided this pitch. These two phrases are reproduced in Examples 4.40a and 4.40b, respectively. Both examples provide Zappa's choice of pedal for different versions of these pieces throughout his career. As shown, the pedals that originally created Ionian modal interpretations are altered in later versions of the pieces. Each modification involves the substitution of the Lydian pedal for the former Ionian pedal. The Lydian substitution in "Uncle Meat" (Ex. 4.40a) not only changes the modal orientation of the melody from Ionian to Lydian but also forces a reinterpretation of the D-sus4 chord that is played throughout; now this chord functions as the trademark G-sus2 chord, representing the first three pitches of the G-Lydian fifth-stack (G-D-A). Further, the new bass ostinato is itself a partial T7 cycle from the Lydian tonic, containing, in order, the pitches G, D, A, and E. Importantly, the Lydian/Ionian substitution is only applied to these phrases and not to those given in Example 4.16a and c: those that *do* contain the Ionian fourth in the melody. In applying this pedal substitution, Ionian melodies without the fourth can be easily modified to become Lydian melodies without the Lydian tonic. Therefore, this procedure results in phrases that conform to Zappa's general tendency of avoiding the Lydian tonic in melodies above Lydian pedals. These two Lydian substitutions can also be viewed as a kind of retrospective "correction," as the overwhelming evidence suggests that Zappa judged the Ionian mode as offering a less definitive "major" tonality than the Lydian.[88]

An example of "reverse" Ionian/Lydian pedal substitution is seen in the treatment of "Theme 1" in "Inca Roads" (ECE 1973/1975a). As discussed in Chapter 2, this theme is divided into two parts. Examples 4.41a and b provide the opening measures of both of these parts,

[88] Later in this chapter, I will discuss another factor that may have contributed to the Lydian substitution of "RDNZL." As for "Uncle Meat," the version with the G-Lydian pedal was performed as part of a medley consisting of "The Dog Breath Variations" and "Uncle Meat." Significantly, "The Dog Breath Variations" is also in the G-Lydian mode; therefore, this pedal substitution may have been employed to bind the two pieces together more smoothly.

respectively. Like most of Zappa's melodies, this diatonic "white key" melody is tonally ambiguous, featuring, for example, two emphasized statements of the (027) set G-D-A. In its "first" statement (i.e., of the original version of the music, Example 4.41a), the melody is left largely "un-interpreted" by a pedal. Only twice does the bass break out of its octave reinforcement of the melody, each time on the pitch F, as indicated. This Lydian "hint" is reinforced at the outset of the second part of the theme (Example 4.41b). Here, the first two measures of part 1 are stated twice, each time above an F pedal. Viewed in terms of F Lydian, the melody conforms to Zappa's practice of Lydian-tonic avoidance for most of its length. (When F finally appears in the melody, at m. 7 of Ex. 4.41a, it is accompanied by a quartal chord F-Bb-Eb, which initiates a transition to the Ab-Lydian system, wherein the pedal F functions as the Dorian pedal.[89]) The melodic absence of the Lydian tonic is central to the pedal substitution that occurs in conjunction with the isomelic variation of Theme 1 (see Example 4.41c). As told in Chapter 2, this music, though occurring "before" Example 4.41a and b in the piece, is actually an addition to the original version of "Inca Roads" (as heard on *The Lost Episodes*). Here, the entirely of Theme 1 is stated above a vamp utilizing a C pedal: the Ionian pedal of F Lydian. Given the avoidance, in large part, of the Lydian tonic F in the melody, most of this music represents the reverse of the Ionian/Lydian substitutions previously discussed. That is, here an originally Lydian texture, sans the Lydian tonic in the melody, becomes an Ionian texture missing the controversial Ionian fourth.

A type of pedal substitution particularly common to Zappa's music is that between Dorian and Lydian pedals. As Lydian and Dorian are viewed in a sense as sonic analogues—as well as being the characteristic major and minor modes of the Lydian system——this

[89] A similar transition to Ab Lydian occurs immediately following Example 4.41b, heralded by the arrival of the pitch F and the quartal melodic structure F-Bb-Eb.

substitution is of special significance. One instance of Dorian/Lydian pedal substitution is shown in Examples 4.42a and b, from "RDNZL." This substitution occurs between the isomelic variations of one of the primary themes of the piece. In the first occurrence of the theme (Example 4.42a), three Dorian scales are presented in succession (D-Eb-E), each a half-step higher than the previous. The melodies above each pedal share the feature of lacking the respective Lydian tonic pitch of their Lydian systems. As shown in Example 4.42b, for the climactic appearance of Theme 2 towards the end of the piece, the first Dorian pedal of Example 4.42a (D) has been replaced by the Lydian pedal F. Because the melody initially lacked the Lydian tonic, this substitution maintains Zappa's tendency of avoiding the melodic occurrence of the Lydian tonic above a Lydian pedal. The employment of the F pedal obviously negates the chromatic bass motion of the original statement, yet the use of the Lydian pedal, the foremost "tonic" of the Lydian system in which D Dorian resides, provides for a greater sense of arrival in the reprise of the theme.

An additional substitution between Dorian and Lydian pedals is found in the instrumental interior of "Rollo/St. Alphonzo's Pancake Breakfast" (ECE 1972/1974a). Example 4.43 provides two occurrences of the main motive of the interlude: essentially the only diatonic music that occurs within this section; the first (a) occurs at the beginning of the interlude and the second (b) closes the section. While the melodic motive itself may suggest C Ionian, the pedal first presented to the listener creates a G-Dorian modal environment (Example 4.43a). As shown, this pedal is accompanied by the (027) chord (Bb-F-C), presented in pitch space as an F-sus-4 chord. In Example 4.43b, the climax of the interlude, the Lydian pedal (Bb) is substituted for the former Dorian pedal. The Bb-F-C chord remains and is now reinterpreted as a Bb-sus2 chord: the trademark chord of the Lydian mode. As in "RDNZL," the pedal substitution provides greater dramatic weight to the final appearance of the motive. (Incidentally, this example likewise conforms to Zappa's practice of avoiding the Lydian tonic in the melody.)

Pedal substitution was not only compositionally achieved by Zappa "on paper," but was also applied via experimental studio practices. This is demonstrated in reference to the oft-cited technique of *xenochrony*, a term Zappa defined as "strange synchronizations."[90] This procedure involves the combination of musical elements recorded at separate times and places (and for different purposes), creating "strange" alignments between performances that were not initially intended to synchronize.[91] One of the most extensive employments of xenochrony in Zappa's career is found throughout the album *Joe's Garage* (1979), wherein all of the guitar solos, with the exception of "Watermelon in Easter Hay," were treated to xenochrony. Specifically, these solos, which were recorded live during the 1979 tour, were placed atop studio-recorded vamps, each different in tempo, meter, etc. to those vamps that originally accompanied the solos. As will be shown, Zappa choices regarding the studio-recorded vamps were based on the concept of pedal substitution.[92]

Example 4.44 compares the vamps that accompanied the original live solos with those that were substituted on the *Joe's Garage* album. (Some of the tracks from *Joe's Garage* employ guitar solos taken from more than one source; similarly, some pieces incorporate more than one studio-recorded accompaniment.) The solo for each track maintains the same diatonic scale throughout; this background Lydian scale for the solo is indicated at the top of each example. For the track "On the Bus" (Example 4.44a), the original vamp in C Lydian, from the

[90] Bob Marshall, "Interview with Frank Zappa," October 22, 1988.

[91] Well known early examples of this practice include the pieces "Friendly Little Finger" from *Zoot Allures* (1976) and "Rubber Shirt" from *Sheik Yerbouti* (1979).

[92] All live elements have not been accounted for; therefore, I will only discuss those instances of xenochrony where the original setting has been identified. See http://globalia.net/donlope/fz/index.html for more detailed information regarding the sources of each track.

song “Inca Roads,” is replaced in different segments of the track by two separate vamps, both in A Dorian. “Keep It Greasey” (Example 4.44b) represents the identical pedal substitution in the Bb-Lydian system, whereby the original vamp in Bb Lydian is substituted for a vamp in its Dorian counterpart G. For the song “Packard Goose” (Example 4.44c), two different live sources comprise the guitar solo; these elements are themselves related by pedal substitution, as the “Easy Meat” vamp tends more towards F# Mixolydian than E Lydian (this interpretation is also influenced by the fact that the song “Easy Meat” clearly has F# as a tonic). The pedal substitution between E Lydian and F# Mixolydian is explored for this solo, as the vamps involved incorporate E Lydian and/or F# Mixolydian elements.[93] In sum, pedal substitution is clearly an important motivating factor in Zappa’s choices of vamps.

2. Progressions within a Lydian system: L/M and D/M.

Up to this point, most musical examples discussed have exhibited harmonic stasis, consisting usually of a single diatonic scale accompanied by one pedal. We now turn to a consideration of ways in which direct progressions can be achieved within a Lydian system. Therefore, I will be dealing with music that maintains a diatonic scale across an entire work (or a significant span of a piece).

Though the retention of a single scale throughout an entire piece is somewhat rare in Zappa’s instrumental output, examples of that phenomenon can be visualized quite clearly in pieces featuring the “white note” diatonic scale. The late piece “Get Whitey” (ACE 1991/1993b), for example, was originally composed with the intention of featuring only the

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[93] Those vamps included in Example 4.43 that feature more than one pedal can be heard as “progressions” in a certain mode. This facet will be explored in the following section.

white key pitches of the piano; the final recorded version added "chromatic" pitches to this white-key palette.[94] A much earlier piece, "Sofa" (ECE 1971/1975a), also maintains the white-note collection throughout. Only with the final chord of the piece, A major, does a "chromatic" pitch occur. However, neither of these pieces is a prime candidate for the Lydian theory. For "Get Whitey," the pointillistic texture does not allow for the type of textural stratification necessary for modal identification in the Lydian theory, particularly due to the difficulty in assigning a pedal. For "Sofa," the compositional style of this piece—a pseudo-German waltz—does not encourage us to cite our "vertical" conception, as a clear chord tone/non-chord tone relationship exists between each melodic pitch and its accompanying harmony.[95]

The opening music of "RDNZL" (ECE 1973/1978b) offers a slightly better test case for viewing progressions within a Lydian system. We have already observed that the "waltz" section of this piece begins in the "white note" F-Lydian mode (see Example 4.40b). Example 4.45 contains all the music preceding the waltz. As shown, this is also primarily white-key music. The example begins with a D pedal and higher-register flourishes in the Vibraphone, creating a D-Dorian modal interpretation. This same mode begins the immediately following Theme 1, which consists of a two-measure idea transposed by T5. Example 4.45 interprets this transposition as a shift in mode from D Dorian to G Mixolydian, allowing for the retention of the F-Lydian system.[96] Of course, D Dorian and G Mixolydian are not strictly "T5-related"; Zappa

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[94] Frank Zappa, liner notes to *The Yellow Shark*, Rykodisc RCD 40560 (1993).

[95] Even with the intended "Germanic" elements of "Sofa," Zappa avoids employing the diatonic scale towards "functional" means. Though the opening melodic line (E-D-C-G-E) and accompaniment suggest C-major tonality, the subsequent music quickly negates such tonal implications. Particularly, explicit emphasis is placed on the G-major chord, which paradoxically never sounds like a V of C major but rather a local tonic, punctuating the end of many phrases and even acting as a sustained pedal towards the end of the piece.

[96] As indicated on the example, the second measure of this basic idea introduces chromatic pitches not part of the F-Lydian system. Some of these, such as the F# and Ab of the bass in the second measure of Theme 1, suggest upper- and lower- leading tones towards the following G mode.

creates this relation by avoiding the third of each mode and thereby concentrating on the pitches that are truly T5-related between the modes: D-E-G-A-B-C and G-A-C-D-E-F. Between Theme 1 and the waltz lies a transitional passage in C Ionian, likewise residing in the F-Lydian system. Considering Example 4.45 in totality, along with the arrival of F Lydian for the waltz, we find a progression featuring pedals within the F-Lydian system related successively by T5: D-G-C-F. Perhaps this T5 schema offers additional evidence as to why Zappa chose to alter the opening pedal of the waltz from C (Ionian) to F (Lydian). That is, in concluding the T5 process on F, the Lydian tonic emerges at both the culmination of the sequence and at the beginning of a new section.

Admittedly, Example 4.45 still operates on a fairly abstract level, as the control of the Lydian tonic emerges retrospectively as the result of a process. I turn now to progressions in which the Lydian tonic is experienced not just in terms of a shared diatonic collection but rather in a way familiar from our traditional notions of "key": that is, where one mode is (or can be) heard as tonic, and progressions to other modes of the system are heard *within* this tonic mode. Consider, for example, the theme of the song "Dog Breath, In the Year of the Plague" (1969a) (Example 4.46).[97] For the purposes of this discussion, I have divided the theme into two "parts," though listeners may generally hear these sections as "verse" and "chorus," respectively. The basic harmonic outline of the theme is simple; Part 1 features a progression that alternates between G-major and A-major chords, while Part 2 similarly alternates between D-major and E-minor-seventh chords. The diatonic collection utilized melodically throughout is that of G-Lydian. Considering the G-Lydian modal system, the bass pitches used in the theme are consistent with the pedals of that Lydian system (G-D-A-E).

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[97] The following comments also apply to "The Dog Breath Variations." I have chosen to discuss the song version of the theme for space considerations.

The question, though, is whether each of these pedals produces the effect of a modal shift or whether one of the pedals is heard as the true tonic of the theme. Answering this question is actually not so simple.[98] The melody is typically ambiguous but does feature, in Part 1, the sequential employment of the two "Lydian tetrachords" discussed by Russell (bracketed on the example). Because these tetrachords suggest tonicization of D and G, respectively, a definitive answer cannot be found therein. Part 2 could easily be interpreted in D major (or Ionian), with the Em7 chord functioning as a substitution for a plagal-functioning IV chord. Is there a possible shift between Lydian-system and major-mode tonality between parts 1 and 2, or is it merely our familiarity with major-mode tonality that permits us to hear part 2 as a typical tonal progression? Either way, the alternating chords of Part 1 certainly cannot be retrospectively heard as IV and V in D major. We may look at a later ACE version of "The Dog Breath Variations" (as heard on *The Yellow Shark* (1993)) for some suggestions in interpreting Part 1. Example 4.47 provides two separate statements of Part 1 of the theme, including an isomelic variation from the introduction of the piece (a) and the first "official" statement (b). As opposed to the alternating chord progression of Example 4.46 (and the ECE version of "The Dog Breath Variations), both of these statements consist of static pedals in the accompaniment. In Example 4.47a, the pedal is E, suggesting the E-Dorian mode; for Example 4.47b, the pedal is A (Mixolydian), with the former bass motion from G to A being relegated to an upper-voice motion above the pedal. While both of these pedals may offer evidence against a G-Lydian interpretation of Part 1, they are consistent with the pedals of the G-Lydian system. Therefore, Example 4.47 may simply represent Zappa's technique of "pedal substitution."

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[98] As an indication of the confusion this issue has caused, James Grier perplexingly considers the first section to represent "tonic and dominant" harmonies and the second section as containing "subdominant and dominant" chords. James Grier, "The Mothers of Invention and 'Uncle Meat': Alienation, Anachronism and a Double Variation," *Acta Musicologica* 73 (2001): 77-95.

Considered in view of the Lydian theory, the chord progression of Part 1 consists of an alternation between the Lydian and Mixolydian pedals. Accordingly, I will hereafter label this progression as the "Lydian/Mixolydian progression" (abbreviated L/M). This pedal oscillation appears frequently throughout Zappa's diatonic titles, being used most often as a guitar-solo vamp (e.g., "Holiday in Berlin," "Inca Roads," "Revised Music for Guitar and Low Budget Orchestra," "RDNZL," "Pick Me I'm Clean") but also appearing in "composed" pieces such as "Strictly Genteel" and "Andy." If one rejects the presence of two separate modes in the L/M progression, preferring instead to hear it as functioning within *one* mode, it is interpreted either as I-II in Lydian or bVII-I in Mixolydian.[99] Both interpretations are actually quite reasonable perceptually and analytically, being essentially distinguished by the factor of whether one interprets the first chord in a hypermeasure (the Lydian chord) as being the tonic or whether one hears the chord that concludes the hypermeasure (the Mixolydian chord) as tonic. There are other contextual clues that can tilt one's interpretation towards one of the two possible modes. In "Andy" (ECE 1973/1975a), for example, the L/M progression (AM-BM) is preceded by four measures of an A pedal, indicating A Lydian as a more viable interpretation. Similarly supporting a Lydian reading, the L/M progression of "Holiday in Berlin" (1961/1970a), DM-EM, follows music clearly "in D" (see earlier discussion of Example 4.9). The Lydian-based interpretation is also supported by Zappa's own comments, with some caveats; when asked to explain the mode of the vamp to "Inca Roads" (ECE 1973/1975a)—an L/M progression between CM and DM chords—he responded "*basically*, it's C Lydian . . . I don't like chord changes. I like to have one tonal center that stays there, or possibly with a second chord that *varies off the*

[99] Bernard, in discussion of "Holiday in Berlin," hears the progression as bVII-I. Jonathan W. Bernard, "Listening to Zappa," *Contemporary Music Review* 18/4 (2000): 89.

main tonal center."[100] This comment suggests the potential to hear the L/M progression as *both* a Lydian I-II progression and a Lydian-to-Mixolydian modal shift within the same Lydian system.

Implicit in Zappa's explication of the L/M progression as being "basically" Lydian is that, barring other contextual evidence, the "first" of the chords in an alternating progression such as L/M—that falling on the strong beat of a hypermeasure—be interpreted as the tonic. For example, Zappa cleverly exploits the potential for inverting one's hearing of the L/M progression on the album *Burnt Weeny Sandwich* (1970) between the tracks "Holiday in Berlin" and "Aybe Sea." Example 4.48 provides the beginning of the guitar solo of "Holiday in Berlin" (Ex. 4.48a) as well as the opening to "Aybe Sea" (Ex. 4.48b). As shown, both excerpts feature alternating progressions with the chords DM and EM. In "Holiday in Berlin" (Ex. 4.48a), the chords appear in the familiar ordering of the L/M progression (DM-EM), while "Aybe Sea" places the EM chord before DM in the alternation. In accordance with the preference for interpreting the first chord in such a progression as tonic, Ex. 4.48a will be heard in D Lydian and Ex. 4.48b in E Mixolydian. On the album, these two tracks, though clearly not recorded at the same time and place, immediately follow one another via edit. Thereby, the E-major chord ending a hypermetric unit in "Holiday in Berlin" is followed by an E-major chord at the beginning of a hypermetric unit in "Aybe Sea." The similarity between the two excerpts of Example 4.48 is underlined by a shared melodic motive (G#-A-B) that begins both melodies (as bracketed).[101]

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[100] Frank Zappa, "Absolutely Frank: Putting Some Garlic in Your Playing," *Guitar Player Magazine*, December 1982. Specifically, Zappa was asked to explain the mode of the track "Shut Up 'n Play Yer Guitar," which is an excerpt from a live "Inca Roads" solo from 1979.

[101] Incidentally, the opening motive of the "Holiday in Berlin" solo seems to have been the genesis of a later-composed melody that ends the solo section of "Inca Roads" (4:35–5:08, *One Size Fits All*). The solo of "Inca Roads," as mentioned above, likewise features the L/M progression (but in C Lydian).

Perhaps the most extensive and multifaceted employment of the L/M progression in Zappa's music is found in the piece "Strictly Genteel" (ECE/ACE 1970/1971b). Here, Zappa blends harmony from the D-Lydian system, particularly the L/M progression, with traditional functional harmony in D major.[102] Example 4.49 offers a reduction of the chorale-style progression that accompanies the "verse" for the work, which appears, with some slight variations, eight times throughout the piece (not including the introduction). Bernard notes the idiosyncratic nature of this phrase, being "nominally in D major, but given a somewhat peculiar coloring by the repeated emphasis upon an E-major triad of ambiguous function, i.e. not V of V."[103] As indicated by brackets on Example 4.49, I interpret the D-Lydian system as controlling the harmonic progression of the first three measures as well as the final two measures of the phrase. Between these Lydian segments, a "parenthesis" of functional D-major harmony occurs, essentially consisting of a descending circle-of-fifths progression (iii-vi-ii-V) with IV substituting for ii. The opening Lydian progression features a succession of the three major triads of the Lydian system arranged in a T7 cycle from the Lydian tonic (DM-AM-EM). The goal of this progression, an E-major chord, produces the "peculiar" Lydian coloring to the phrase observed by Bernard. Though abandoned during the switch to the traditional tonal system, this chord is regained at the end of the phrase, as if "prolonged" by a tonal detour. The reading of mm. 4–9 of the example as a type of tonal insertion within essentially Lydian music is supported by the repeated Coda/fadeout of the piece (see Example 4.50). As can be seen, this progression is identical to Example 4.49 except for the deleted tonal parenthesis, leaving only the two Lydian segments identified above.

[102] "Strictly Genteel" originally appeared with vocals for the version heard on the album *200 Motels* (1971). Ashby discusses the piece as a parody of Broadway musical finales. Arved Ashby, "Frank Zappa and the Anti-Fetishist Orchestra," *The Musical Quarterly* 83/4 (1999): 557–605.

[103] Bernard, "Listening to Zappa," 88.

Due to the emphasis placed on the E-major chord in Example 4.50, the triadic progression DM-AM-EM can be viewed as a variant of the L/M progression of D Lydian. Within this progression, therefore, the A-major chord functions as a connective chord between DM and EM. Reducing the passage as such is given credence by the instrumental interlude of the piece, which is almost entirely based on the L/M progression. Example 4.51 offers the first two segments of this interlude. The first of these segments features a D pedal with the L/M progression occurring in the chords above, each chord containing an added second. In the second segment, the L/M progression occurs alongside the typical pedal shift, with four measures of DM followed by four measure of EM. In sum, the interlude helps clarify the harmonic idiosyncrasies that characterize the rest of the piece.

A progression similar to L/M features the alternation between the Dorian and Mixolydian pedals of the same Lydian system (hereafter the "D/M progression"); this progression involves a minor chord moving to a major chord a perfect fourth above/perfect fifth below. At various times in his career, Zappa colorfully referred to the D/M progression, in its form as a shuffle vamp in "City of Tiny Lites" circa 1980–88, as "The Carlos Santana Secret Chord Progression" and "That Ol' G Minor Thing."[104] It is most commonly encountered in guitar-solo vamps in pieces such as "Zoot Allures" (*Zoot Allures* album version) and "Yo Mama," but can also be found in "composed" pieces such as "Montana" (refer back to Example 4.39c).

As with L/M, various interpretations of the D/L progression are possible, depending on whether one hears two separate modes at play or whether a certain "key" is heard to predominate. Because the two modes in consideration here are of different types, minor and

[104] These titles appear, respectively, on the albums *Shut Up 'N Play Yer Guitar Some More* (1981) and *Guitar* (1988). This vamp likely resulted as an imitation of Santana's cover of the song "She's Not There" by the Zombies, which begins with a D/M progression in G minor. (Also, around the time the vamp first appeared (1980), Zappa was known to quote "She's Not There" during various pieces, including "City of Tiny Lites." The D/M progression is also used in the Santana song "Oye Como Va."

major, this issue would seem more easily resolved than in the L/M progression. The "City of Tiny Lites" vamp, for example, is clearly Dorian. However, the modal orientation of most examples of the D/M progression is not as clear cut. As mentioned above in reference to the D/M progression at the end of "Montana" (Example 4.39c), both potential modal interpretations, F# Dorian and B Mixolydian, are supported by different sections of the song. Therefore, it is quite plausible to hear two competing modes as opposed to a progression within one mode. In other cases, context can provide important evidence. The D/M progression that concludes the solo to "Yo Mama" (ECE 1977/1979b) (Bm-EM), for example, follows a lengthy pedal on E (Mixolydian), thereby indicating the second chord of the D/M progression as a more likely tonic. As was true for L/M, the chords of the D/M progression may switch places, with the Mixolydian chord occurring first. For the guitar-solo "Theme from Burnt Weeny Sandwich," (ECE 1967/1970b), for example, the vamp shifts between D-major and A-minor chords. Because the Mixolydian pedal appears first in the progression, and in a strong hypermetrical position, it is easier to hear this solo as being in D Mixolydian than in A Dorian.[105]

The most extensive employment of the D/M progression in a "composed" piece is found in "Oh No" (ECE 1967/1968b). Both the opening phrase (Example 4.52) and Coda (Example 4.53a) utilize the progression.[106] As can be seen, the melodies of both of these excerpts are characteristically tonally ambiguous. For example, in Example 4.52, tonally indeterminate perfect fifths/fourths abound in the melody (bracketed). Hence, the oscillation between pedals

[105] Bootleg outtakes reveal that "Theme from Burnt Weeny Sandwitch" was originally recorded as the tail end to the song "Lonely Little Girl" from the album *We're Only in It for the Money* (1968). Significantly, "Lonely Little Girl" also uses the D/M progression in its "reversed" form.

[106] Curiously, the isomelic variation of the first phrase does not continue the D/M progression in the accompaniment.

on E and A cannot be assuredly interpreted as either i-IV in Dorian or v-I in Mixolydian. The same is true of the alternating pedals C# and F# of Example 4.53a.

The later “Son of Orange County” (from *Roxy and Elsewhere* (1974)) offers important clues for interpreting the D/M progression (see Example 4.53b). This piece essentially consists of an isomelic variation of Example 4.53a, followed by a lengthy solo. As can be seen, the D/M progression of Example 4.53a is modified to the familiar L/M progression in Example 4.53b. This is achieved by substituting an E-major chord, representing the Lydian tonic, for the C# pedal of Example 4.52a. Therefore, the D/M progression can be viewed as a variant of the L/M progression, created via pedal substitution.

Besides touching upon Zappa’s three favorite modes—Lydian, Mixolydian, and Dorian—L/M and D/M progressions offer numerous benefits. First, they combine motion with stasis, as motion is achieved via the pedal shifts while stasis results from the repetitious employment of the progressions and the maintained diatonic collection. Second, L/M and D/M progressions are inherently ambiguous. They allow for different modes of listening, one oriented towards a single modal interpretation (i.e., key) and another permitting the influence of a simultaneous competing modal hearing. Importantly, these are ways of hearing that would be at odds in relation to traditional functional tonality. Within the Lydian system, however, they are not mutually exclusive. That is, while the Lydian system identifies one mode (the Lydian) as the “most tonic” of the system, it nevertheless includes other modes within the system that may also act as local tonic.

3. Progressions between different Lydian systems.

Because Zappa prefers those modes created by pedals within the first five pitches of a Lydian fifth-stack, bass progressions within a single Lydian system are fairly limited. As observed in the immediately preceding discussion, pedal shifts by major second and perfect fourth/fifth are most common. Because the potential pedals of the Lydian system comprise an anhemitonic pentatonic set, intervals of ic 1 and ic 6 are completely absent. Therefore, any semitonal bass motion in Zappa's diatonic music will necessarily result in a shift in Lydian system. To illustrate, observe the opening music of the instrumental interlude to the song "Drowning Witch" (1981/1982) (Example 4.54). Here we find the descending chromatic bass line Gb-F-E, each successive pedal of which creates a shift to the Lydian system in which that pedal is the tonic. Because all semitone-related pedals in this excerpt are Lydian pedals, each shift produces a vastly different pitch collection. For example, the first two modes presented, Gb and F Lydian, only hold the two pitches F and C in common; these two pitches (circled) are actually retained in the same voice within the accompaniment. Towards the end of the interlude, the descending semitone between pedals on Gb/F# and F makes a final appearance (see Example 4.55).[107] Here, as opposed to Example 4.54, the two pedals are not both Lydian. The first pedal, F#, supports 16 measures of a sustained F#-minor triad, over which triads within the F#-Dorian collection are sounded on each quarter note.[108] When the pedal progresses to F, David Lewin's SLIDE transformation occurs between the previous F#-minor triad and the new F-major triad,

[107] Pedals on F# and F are central to the interlude as a whole, as most formal sections within the interlude are articulated by these two pedals.

[108] The only significant triad not found within the F#-Dorian collection is C# major. This triad almost always precedes and tonicizes the F# minor tonic.

over which chords from the F-Lydian collection occur.[109] The SLIDE transformation retains the third A, one of the three common tones between the F#-Dorian and F-Lydian modes.

These two examples indicate the importance of common tones in mediating the potential abrupt effect produced by shifts in Lydian system. Theoretically, the issue of common tones between Lydian systems requires little unfamiliar from traditional tonal theory. As any given mode occurs in only one Lydian system (i.e., diatonic collection), modes within a single Lydian system are analogous to "relative" major and minor keys, retaining all seven common tones. Thereafter, the number of common tones between different Lydian systems is greatest for those systems separated by just one perfect fifth. Hence, F Lydian and C Lydian, or F Lydian and Bb Lydian, retain six common tones. The different number of common tones held between the semitonal progressions of Example 4.54 and 4.55 results, therefore, from the greater distance in perfect fifths of F# Lydian and F Lydian (five) compared to F# Dorian (A Lydian) to F Lydian (four).

The retention of common tones is an issue of special importance to Zappa's guitar solos. As we have seen, most of the solos are accompanied by vamps utilizing a single Lydian system throughout. For those that include more than one Lydian system, the common tones held between the systems most often constitute the primary pitch collection used for the solo. Two related examples are found in the solos "Black Napkins" (1976) and "The Deathless Horsie" (1978/1981b).

The vamp of "Black Napkins" is an oscillating progression similar to the L/M and D/M progressions, alternating between C#-minor-seventh and D-major-seventh chords. The semitone interval between these two pedals naturally necessitates a shift in Lydian system. In accordance

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[109] See David Lewin, *Generalized Musical Invertals and Transformations* (New Haven: Yale University Press, 1987): 187.

with Zappa's typical practices, the C#-minor-seventh chord receives Dorian treatment, while the D-major-seventh chord shifts to D Lydian. The Lydian systems produced by these chords, E Lydian and D Lydian, are shown side-by-side in Example 4.56. As indicated on the example, these two Lydian systems, being of a distance of two perfect fifths, hold a pentatonic collection in common. When occurring over the C#-minor-seventh chord, this collection functions as the "minor-1" pentatonic; when the harmony shifts to a D-major-seventh, the collection becomes the major pentatonic. As Example 4.57 shows, the melodic theme of "Black Napkins" utilizes only the pitches of this common pentatonic collection. When the improvisation begins, however, the respective seven-note diatonic scales implied by the chords become available. Nevertheless, the primary pitch collection used in the solo remains the commonly held pentatonic set, while the semitone-related pitches that differentiate the two modes (D#-A# and D-A) are used sparingly. A note count of the published transcription of the performance of "Black Napkins" from the album *Shut Up 'N Play Yer Guitar Some More* (1981), entitled "Pink Napkins," finds that all pitches of the pentatonic collection appear well over one hundred times in the solo, while the remaining non-pentatonic pitches appear as much as forty or as little as ten times.

The vamp of "The Deathless Horsie" features a melodic ostinato accompanied by a pedal. Example 4.58 provides a summary of the performance as heard on *Shut Up 'N Play Yer Guitar Some More*. For over three minutes of this performance, the A-Lydian system is employed. The six-pitch ostinato is first set to the Mixolydian pedal of that system (B), followed by a lengthy stretch of the Lydian pedal A. Only with the pedal on A does the full seven-note diatonic collection exist in the accompaniment; over the previous B pedal, the improvisation was responsible for providing the remaining pitch (A). The missing A of the ostinato plays an important function in relation to the modes of the solo. Over the Lydian pedal A, its absence conforms to Zappa's practice of avoiding the Lydian tonic in the melodic zone. When the pedal shifts to C# at 3:21, however, the missing A is even more central. This C# pedal, along with the ostinato, implies a C#-Dorian mode, and thereby a shift to the E-Lydian system. As this system is merely one fifth away from A Lydian, six pitches are held in common between the modes. Significantly, these six pitches are the same notes that comprise the melodic ostinato. Similarly, Zappa's improvisation over the C# pedal utilizes only the six common tones between the systems, thereby avoiding the pitches that differentiate the modes: A/A#. Confirming that the modal implication of the C# pedal is Dorian, Zappa quotes the theme of "Black Napkins" at 4:10 of the performance (refer again to Example 4.57).[110] As noted above, this theme incorporates the E-Lydian system above a C#-minor seventh chord; its quotation above a C# pedal in "The Deathless Horsie" thereby implies the conceptual presence of the missing A# of C#-Dorian.

The T7/T5 cycle can also prove consequential in progressions between Lydian systems. The main theme of "Duke of Prunes" (ACE/ECE 1963/1967), for example, features an accompaniment that alternates regularly between the F- and G-Lydian systems (see Example 4.59). Like many of the progressions between systems witnessed thus far, the pedals employed here create a semitonal bass motion F (Lydian) to E (Dorian).[111] Even before the entrance of the main melodic theme, the T7 interval cycles of the two Lydian systems are invoked. As shown, above both the F and E pedals, the first three pitches of their respective Lydian fifth-stacks are

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[110] An earlier performance of "The Deathless Horsie" from Halloween 1978, as heard on the DVD-A *Halloween*, contains a more complete quotation of "Black Napkins" at 12:38.

[111] In the original version of the piece, from the movie score *Run Home Slow* (1965), and in the first statement of the theme on *Absolutely Free* (1967), a single E pedal persists throughout the theme. This suggests that F Lydian has the role of a kind of "upper neighbor" to E Dorian. This reading is supported by the presence, in the *Run Home Slow* score, of additional orchestral cues based on the "Duke of Prunes" theme solely in E Dorian. In the second statement of the theme on *Absolutely Free*, and for a later orchestral version circa 1976, as heard on *Orchestral Favorites*, the pedals do oscillate between F and E.

stated in quintal formation.[112] Over this oscillating accompaniment, the theme is stated three times, the second and third statements being isomelic variations and/or fragmentary versions of the pitch succession of the initial statement. As indicated on the example, this theme unfolds a T7 cycle. However, this T7 cycle is not that of the F- or G-Lydian fifth-stacks, but that of C Lydian. The first three pitches of the theme (G-C-B) are the only pitches that are "out of order" within the T7 cycle. By inverting the order of C and G, and following C with its leading tone B, the pitch C emerges strongly as a tonic in the melodic zone. Importantly, however, the pitch C is *not* a common tone of both Lydian systems of the accompaniment, as it is not included in G Lydian (even though it occurs several times over the Dorian pedal E). Nevertheless, the C-Lydian collection contains an identical number of common tones with both systems, being one fifth in distance from both F and G Lydian. Therefore, its pitch collection abstractly mediates between the Lydian systems of the accompaniment.

The complete twelve-note T7 cycle proves important in linking the various Lydian systems of Example 4.60, from "Echidna's Arf (Of You)" (ECE 1973/1974b). In Chapter 3, this phrase was discussed as an example of a "grouping dissonance" G9/5. The 9-layer itself is created by a melodic sequence that successively transposes the nine-pitch melodic idea by T2. Each transposition similarly creates a shift in Lydian system by T2. The sequenced idea is constructed of two parts: (1) a five-note realization of the first three pitches of the Lydian fifth-stack (i.e., C-G-D in the first segment); and (2) a four-note descending arpeggiation of the tonic major-seventh chord of the Lydian system. Of these elements, the (027) set allows for a smooth transition between each transposition. For example, the (027) of C Lydian (C-G-D) is answered in D Lydian by D-A-E; therefore, the first pitch of the T7 cycle in D Lydian (D) is the same as

[112] For the *Orchestral Favorites* performance, these quintal structures are stated as staccato chords in the brass.

the last pitch of that in C Lydian. Example 4.61 details the structure of the linked (027)s throughout Example 4.60. As shown, the entire T7 cycle (and twelve-note aggregate) is exhausted, and the opening pitch C also acts as the final, emphatically stated pitch.[113]

A final example demonstrating the function of T7/T5 cycles in progressions between Lydian systems is shown in Example 4.62, from "Theme 2" of "Inca Roads" (ECE 1973/1975b). These measures involve the consistent alternation between F- and D-Lydian pedals, accompanying a "perpetual motion" melody in sixteenth notes. As shown on the example, the melody is saturated with various T7/T5-cyclic structures. The set created by a three-note T7/T5 cycle, (027), is particularly salient. For the majority of the excerpt, the pitches sounded on the first, fourth, and seventh sixteenth notes of a measure create the (027) set (mm. 6 and 8 create (027)s more clearly with the first, third, and fifth pitches). For the first four measures, this structure is articulated by the presence of three-note segments related by T5. In each of these measures, the first three notes are transposed by T5 to generate the following three pitches; subsequently, a third T5 transposition is feigned, generating the seventh pitch of the measure. This seventh pitch has two functions: (1) it completes the (027) set; and (2) it leads by step into the first pitch of the next measure, wherein a shift to the opposing Lydian system occurs. Therefore, the listener largely navigates the progressions between F and D Lydian by focusing on the completion of the (027) sets.

Let us conclude by considering, along the lines discussed in this section, how different Lydian systems might be integrated across a larger, episodic work. The piece in question is

[113] The structure shown in Example 4.61 accounts for some of the curious features of the grouping dissonance discussed in Chapter 3. As told in that chapter, the 9-layer, from the outset of the passage, is displaced by three rhythmic units from the 5-layer of the accompaniment. Typically, alignment between the two layers would occur after nine notated measures; due to the displacement, an extra tenth measure is necessary, which allows for the completion of the final sequential statement of the 9-layer plus a additional three-note partial statement of the 9-layer. Significantly, the opening displacement of Example 4.60 helps articulate the plan of linked (027)'s outlined in Example 4.61. Specifically, it makes possible the emphatic climax on the pitch C on the downbeat of the eleventh measure of the example.

"Andy" (ECE 1974/1975a), a stylistically varied song constructed of six distinct thematic modules, which I will label M1 through M6. Example 4.63 offers transcriptions of the modules in question. (As most of these episodes appear more than once—and sometimes varied in texture, rhythm, etc.—the transcription given provides the details considered most essential.) The analytical annotations applied to each module on the example indicate the Lydian system in which each theme resides, as well the pedal in use and any other characteristic progressions or collections. Scanning these themes, one finds several different Lydian systems (and modes within these systems) employed; further, modes are represented by many of the tonal structures detailed throughout this chapter, including static pedals (M1 and M5), sus-2 chords (M2) as well as the two trademark oscillating progressions, L/M (M1) and D/M (M4). Further, one finds the use of minor-1 pentatonic in the coda (M6).

Having described some of the musical variety within the modules, how does one hear such disparate content as being unified at a higher level? The first task in answering this question involves identifying a referential diatonic collection from which relations can be determined. To this end, the A-Lydian scale is the clear choice, given its prevalence within the thematic modules. As shown in Example 4.64, a formal outline that details the modular layout of the piece, the episodes of the piece given the most formal prevalence are all within the A-Lydian system. These include the Lydian "main theme" M1, which appears every three modules, as well the interior theme M5 and the guitar solo[114]; further, both M3 and M6 feature modes of the A-Lydian system.

How, though, does A-Lydian retain control over the modules within different Lydian systems, namely M2 (in D Lydian) and M4 (in E Lydian)? As with earlier examples, the answer to this question is found by considering common tones between Lydian systems. That is, both D

[114]These three themes are all closely related, having similar pedal accompaniments.

Lydian and E Lydian are Lydian systems removed by one fifth from the referential A-Lydian system. Therefore, they both contain six common tones with A Lydian. The manner in which these common tones are exploited is indicated visually by Example 4.65, wherein the pitch content of each module is shown in both melodic and accompaniment zones. Common tones with the A-Lydian collection are indicated by open noteheads, while filled-in noteheads represent pitches outside this referential collection. As can be seen, the melodic zones of both M2 and M4 contain only common tones with A Lydian, while accompaniments zones within these modules feature the pitches unique to these Lydian systems. Therefore, throughout the entire piece, the pitches introduced in the melody are entirely contained within the A-Lydian scale, providing a degree of pitch continuity that works to lessen the disjointed, episodic nature of the piece. Interestingly, the only challenge to this reading is presented by M3, a module featuring the Ionian mode (E) of A Lydian. As shown, this module represents Ionian via a modified "blues" progression I-IV-I-V. Typically, such as functional progression would be considered the parlance of the opposing major-key tonal system, and thereby not contained within the Lydian-system framework. The use of "blue" notes G natural and D natural in the melodic zone therein furthers the sense of "otherness" represented by M3 in the context of the piece. Nevertheless, even if we conceptually separate M3 from the remainder of the thematic modules, the pitch content of its key (E major) remains identical to that of A Lydian, and thereby integrated at the level of diatonic collection.

IV. Concluding remarks.

In this chapter, I have introduced the concept of a Lydian system, containing a limited group of diatonic modes generated from a common Lydian scale. Within this system, the Lydian mode, due to its structural attributes, has been shown to function as a tonic state representative of major tonality. This "vertical" tonal system stands in opposition to that of traditional major-key-oriented tonality, lacking as it does the characteristic "horizontal" resolution from dominant to tonic. Though I have yet to investigate the applicability of the current theory to repertoires besides Zappa's diatonic music, one would expect to find at least a degree of agreement with the practices of repertoires that privilege harmonic stasis and textural stratification. That said, though Zappa's music is certainly influenced by many trends in twentieth-century music, Zappa was keen on developing his own original approaches to composition. Thus, the Lydian-based approach described here, which treats Lydian as tonic while allowing for a highly codified, limited treatment of additional diatonic modes, represents Zappa's original solution to composing with the diatonic scale.

CHAPTER V

NON-DIATONIC MUSIC

Introduction.

We conclude this study with a discussion of Zappa's non-diatonic music. As one might predict, the compositional techniques utilized within this repertoire are the most removed from those of pop/rock music. Therefore, our examination of pitch organization in this repertoire will allow us to gain a greater understanding of Zappa's inheritance from his post-tonal influences, particularly Varèse and Webern. In sum, it will be shown that Zappa's approach to non-diatonicism represents a unique response to certain stylistic and structural factors in the music of these composers.

The term "non-diatonic" is being used here in a very general sense, as the works under investigation in this chapter are quite diverse in terms of style and scoring. In order to distinguish trends within this group, this chapter is divided into two large sections, the first dealing with *chromatic music* and the second with titles that incorporate *non-diatonic scales* in certain dimensions of the musical texture. Specifically, part one deals with the influence of serialism in Zappa's chromatic music, while part two examines scalar structures and issues relating to a "Chord Bible" created by Zappa for his orchestral works. Accordingly, the discussion found in part one of the chapter is significantly removed theoretically from the Lydian theory proposed in the previous chapter, while part two exhibits several connective threads to the Lydian theory, given its basis in the notion of scale. Though part one might thereby appear to be a slight detour, there are benefits to discussing chromatic music prior to non-diatonic scalar music. First—as we will see—chromaticism is most evident as a melodic device, whereas non-diatonic scales, while also present melodically, come to the forefront primarily as a response to Zappa's initial lack of a harmonic system for his non-tonal pieces.[1] Second, as implied by the previous point, chronology is a factor in the layout of my discussion. That is, Zappa's specific use of non-diatonic scales generally comes *after* his first works exhibiting chromaticism.[2] Further, this type of chromaticism remains active in certain musical parameters of the works incorporating non-diatonic scales. Therefore, part two of this chapter describes a particular type of merging between the two seemingly incompatible concepts.

I. Chromatic music.

A. Early experiments with serialism.

As mentioned in Chapter 2, Zappa was first introduced to serial music (particularly that of Webern) by his high-school music teacher Mr. Kavelman. An important consequence of this experience was Zappa's own attempts at twelve-tone serial composition, which represent his first true forays into post-tonal composition. Zappa's accounts vary as to when these early experiments were undertaken, but it can be deduced that they occurred sometime between the ages of 17 and 19 (between 1957–59).[3] Therefore, some of these works may have been composed while he was receiving his formal education in tonal harmony. As we will see, the

[1] The ECE or ACE status of a work also comes into consideration in this format, as Zappa's employment of non-diatonic scales is also tied to factors of instrumentation, being most commonly found in orchestral works.

[2] It should also be noted that the lack of scores for Zappa's late-period works, particularly for Synclavier works and pieces recorded for the album *The Yellow Shark* (1993), has had the greatest effect on this chapter. Most of the works composed during this period would fall into the non-diatonic category. Therefore, the story told in this chapter is necessarily incomplete, ending in roughly 1984.

[3] See Perlich 1972, Menn 1994 and VPRO documentary 1971.

composition of these works, and the ultimate fallout that occurred after Zappa heard them performed, marks an important point in the development of his chromatic style.

Unfortunately, a comprehensive discussion of Zappa's serial music cannot be undertaken at the present, as only one of these pieces is available to the analyst: a work entitled "Waltz for Guitar" (1958).[4] Zappa described the piece as follows:

> This is a 12-tone crab canon written when I was 18. There's actually another version for two guitars, so it's a double crab canon. I don't know where it is though. I'd been doing 12-tone music for quite some time before I did this, but it was the first time I'd tried to write something for the guitar. I couldn't play it, and I never got to hear it until I got the Synclavier. And because it's printed on the Synclavier, that also means I got to push the button and listen to it. It's kind of short and boring.[5]

Example 5.1 provides the first section of "Waltz for Guitar," which employs the twelve-tone row <76T94823E501>. No transpositions, inversions, or retrograde inversions of the row are found in the piece, which instead consists of eight untransposed statements of the row—four in the first section and four in the second section. The row itself is highly saturated with ic 1s between adjacent pitches. As indicated in brackets on the first statement of the row (mm. 1–3), all of these ic 1 dyads are stated as pitch intervals 11 or 13 (i.e., not as half steps). This characteristic was likely appropriated from Webern, and will remain of import in Zappa's non-serial chromatic works. Though Zappa's description of the pieces as a "crab canon" may lead one to expect an inversional relationship between statements of the row, the technique utilized herein is actually much simpler. The first statement of the row is presented in a two-voice texture, establishing a rhythmic relationship between the voices that is maintained in the following three statements.

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[4] This music was published in the *Zappa!* special issue of *Keyboard/Guitar Player Magazine* in 1992.

[5] Ibid. Oddly, Zappa's quote does not inform that this work had, in fact, appeared much earlier in his career as a segment (2:12–3:02) of the multi-part "Brown Shoes Don't Make It" from the album *Absolutely Free* (1967). Transposed by T1 from its original form and embellished, this music accompanies Zappa's "Sprechstimme" to the words "We see in the back of the city hall mind . . . ." Additionally, the scoring of the original guitar version is altered to an approximation of a "Pierrot ensemble" (flute, clarinet, piano, violin, cello, and what sounds like a muted trumpet). Such scoring, along with the employment of "Sprechstimme," suggests that the aforementioned segment of "Brown Shoes" is intended to imitate Schoenberg's *Pierrot Lunaire* (1912), though that work is notably *not* a twelve-tone piece.

When the second presentation begins on G4 in m.3, the voices switch octaves, with the upper voice of the first statement appearing an octave lower and the lower voice moving up one octave, thereby representing an inversion of voicing rather than interval (i.e, invertible counterpoint). The octave assignments of the voices in statement one are restored in statement three (mm. 6–8), while statement four (mm. 9–11) is identical to statement two (though, of course, shifted in relation to the meter). Similar principles apply to section two of the piece (not shown), which begins with a new textural realization of the row. Only here, statements one and four are related by "crab canon" (i.e., voice inversion), as are statements two and three.

Of course, a single piece does not provide enough evidence for one to make global conclusions about Zappa's early serial pieces. Though "Waltz for Guitar" is extremely simple in its employment of twelve-tone rows, Zappa must have been aware of more complex methods of row manipulation. He recalled "writing all kinds of positive and negative canons and weird inverted this and retrograde that and getting as spaced-out mathematically as I could . . . ."[6] In fact, he claimed that the intellectual rigor of serialism, whereby (according to him) the "intrinsic value is determined arithmetically by how nicely you've manipulated all these twelve notes," was the factor that initially attracted him to the technique.[7] That having been said, it remains possible that Zappa's understanding of twelve-tone composition was limited and simplistic, especially given some of his later generalizations about serialism (to be detailed below).

According to Zappa, his rejection of serialism came as the result of hearing some of his twelve-tone works performed:

> I finally got a chance to hear some of it, and I really didn't like the way it sounded, so I stopped doing it . . . . I had heard some twelve-tone pieces by other composers that I liked, which is one of the reasons why I went in that direction, but as a system it was too limiting for me. I asked myself

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[6] Martin Perlich, "Interview with Frank Zappa," recorded 1972.

[7] Don Menn, "The Mother of All Interviews," *Best of Guitar Player*, 1994.

> the basic question: If the intrinsic value of the music depends on your serial pedigree, then who in the fuck is going to know whether it's any good or not?: only the people who sit down with the score and a magnifying glass and find out how nicely you rotated the notes. And that's pretty boring.[8]

Zappa echoed these sentiments in his autobiography, describing the widespread use of serialism by post-war composers in scathing terms:

> For a while there, unless you were doing serial music (in which the pitches have numbers, the dynamics have numbers, the vertical densities have numbers, etc.)—if it didn't have a pedigree like that, it wasn't a good piece of music. Critics and academicians stood by, waiting to tell you what a piece of shit your opus was if your numbers didn't add up. (Forget what it sounded like, or whether it moved anybody, or what it was about. The most important thing was the numbers.)[9]

In rejecting serialism on these terms, Zappa was performing a drastic shift from his claimed teenage interest in an intellectual, systematic approach to pitch. This change might also be seen as a movement towards the aesthetics of Varèse, who, as discussed by Bernard, similarly despised the concept of "system."[10] In substitution for the systematic approach of serialism, Zappa moved towards what he called a "more haphazard style" dictated by "whatever sounded good to me for whatever reason."[11]

Indeed, Zappa's chromatic works do not exhibit a tightly-organized pitch system comparable to serialism. Accordingly, the compositional techniques found therein often resist theoretical formalization. That said, there are several compositional *tendencies* that manifest themselves across many of these titles. With Zappa's limited background in serialism in mind, some of these techniques can be viewed as by-products of his early interest in twelve-tone

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[8] Ibid.

[9] Frank Zappa and Peter Occhiogrosso, *The Real Frank Zappa Book* (New York, NY: Touchstone, 1999): 188–189. These views, which depict serialism as a source of tyranny to non-serialist composers, are fairly common. They have been questioned more recently by Joseph Straus. See Joseph Straus, "The Myth of Serial 'Tyranny' in the 1950's and 1960's," *The Musical Quarterly* 83/3 (1999): 301–43; and *Twelve-tone Serialism in American Music* (Cambridge University Press, 2009).

[10] Bernard writes, "If there was one word which was anathema to Varèse above all others it was "system." For him the word connoted an inability to think for oneself." Jonathan W. Bernard, *The Music of Edgard Varèse* (New Haven: Yale University Press, 1987): xvii.

[11] Menn, 1994.

composition (though we will also consider some other potential precedents). In the following section, I will discuss three issues of importance to Zappa's chromatic pieces: *pitch-class diversity, chromatic saturation*, and *symmetry*.

B. General features of the chromatic works.

1. Pitch-class diversity.

John Covach defines the "twelve-tone idea" as a "systematic circulation of all the twelve pitch classes in which no pc is repeated before all twelve have been sounded."[12] The concept of pitch-class circulation is also applicable to the works under discussion, albeit in a significantly more limited way. In Zappa's works, a twelve-tone row is never employed; additionally, the *systematic* circulation of all twelve pcs is not a consideration. What remains is an inclination to avoid pc repetitions within the most apparent segments of the music—a procedure I will term "pitch-class diversity." As in much twelve-tone music, this tendency allows for immediate pc repetitions, but not for the reemergence of a pc following the introduction of a new pc within a segment. Of course, this process cannot be considered a circulation per se, as the pcs do not regularly circulate back to an initial pitch, but it does result in a fairly rapid diversification of pcs within musical segments. This technique also contributes to the general lack of a referent or centric pc in the chromatic works, as it assists the composer in avoiding emphasis on any particular pc.

[12] John Covach, "Twelve-Tone Theory," in *The Cambridge History of Western Music Theory*, ed. Thomas Christensen (Cambridge: Cambridge University Press, 2002): 604. This definition is similar to that offered by Webern, who described a "rule of law" whereby "until all twelve notes have occurred, none of them may occur again." Anton Webern, *The Path to the New Music*, ed. Willi Reich (trans. by Leo Black) (Bryn Mawr, PA: Presser), 51.

Because the concept of pc diversity is applicable to nearly all of the excerpts to be discussed in this section, only one example will be examined currently: the central section of the ACE version of “Dupree’s Paradise” (1984a) (mm. 151–182), a piano interlude occurring in the B section of the piece. Example 5.2 provides the music in question, with some limited analytical overlay. Here, the notated measures constitute the pc-diverse segments. Because each measure consists of six eighth notes, six distinct pcs occur in each measure (this excerpt does not feature the occasional immediately repeated pitch). The only exception to this tendency is m. 161, in which the pitch E occurs twice. (This aberration marks m. 161 for attention, as its chromatic idea is restated at T11 at m. 167 then transposed again at T9 in the subsequent measure; in the final measure, it reappears as a T8 isomelic variation of mm. 167–168.) Other than direct restatements or transpositions of certain measures (as indicated on the example), no significant set-class equivalences relate the various measures. Beyond the available twelve-pc aggregate, therefore, no scalar resource furnishes the pitch collection for the passage. Instead, a highly intervallic approach predominates. Particularly, pitch intervals 1, 3, and 7 often saturate individual measures (see for example mm. 151, 153, and 163). Of these intervals, ic 3 in the form of a descending minor third plays a larger role in the events of the section, as it is projected as the T9 transpositions that occur between mm. 167–168 and mm. 175–182. In sum, Example 5.2 demonstrates pc diversity functioning within small but salient segments of the music. Though the manner in which pc diversity is applied is not particularly systematic, lacking as it does referential collections and a process by which pcs reappear, its employment is essential to the music’s effect.

2. Chromatic saturation.

The completion of the twelve-tone aggregate is, of course, a trademark element of twelve-tone composition. Though Zappa never employs a twelve-tone row, a degree of chromatic saturation is also a key characteristic of much of his chromatic works.[13] However, the exhaustion of the entire twelve-pc aggregate is not always of central importance. Rather, one finds at the very least the completion of smaller chromatic segments (i.e., containing fewer than all twelve pcs): a technique often coupled with pc diversity. The following examples will demonstrate how chromatic saturation is employed at various levels of compositional structure in Zappa's music. We will begin with examples in which the process of chromatic saturation is applied primarily within pitch space through semitonal voice leading and transition to more characteristic examples in which chromaticism is achieved through the rapid exhaustion of most (or all) of the twelve pcs. As the latter examples will exploit chromaticism in pc-space, they will more extensively appropriate features from twelve-note serialism.

One simple but illustrative initial example of complete chromatic saturation is found at the beginning of "The Eric Dolphy Memorial Barbecue," (ECE 1969/1970b) (Example 5.3). In the first phrase of this excerpt (mm. 1–4), the opening motive (B-D-C#-A#) fills in most of the chromatic space from A#4 to D5, missing only C5. This "gap" is filled in the third measure, but as C4 rather than C5.[14] This octave displacement of C, which we "expected" to hear an octave above, shows Zappa exploiting the concept of pitch class, whereby any C is capable of

[13] The importance of chromatic saturation to non-serial music has also been discussed by Joseph Straus in reference to the music of Ruth Crawford, Robert Morris in description of the music of Varèse, and Catherine Losada in discussion of postmodernist collage compositions of Rochberg, Berio, and Zimmermann. See Joseph Straus, *The Music of Ruth Crawford Seeger* (Cambridge: Cambridge University Press, 1995); Robert Morris, "Equivalence and Similarity in Pitch and Their Interaction with Pcset Theory," *Journal of Music Theory* 39/2 (1995): 207–44; Catherine Losada, "Between Modernism and Postmodernism: Strands of Continuity in Collage Compositions by Rochberg, Berio, and Zimmermann," *Music Theory Spectrum* 31/1 (2009): 57–100.

[14] The concept of "gap-fill" is discussed at length by Leonard Meyer. See Leonard Meyer, *Emotion and Meaning in Music* (Chicago: University of Chicago Press, 1956).

performing the desired task at hand. Following the introduction of pc 0, the chromatic set-class 5-1 (01234) is further expanded with the addition of pc 9 in m. 4, establishing a six-note chromatic segment, consisting of pcs {9TE012}, for the first phrase as a whole. The second phrase begins with an isomelic variation of the opening motive followed by a compound melody discussed previously in Chapter 3. This compound melody serves to introduce the remaining pcs missing from the first phrase, as the upper line of the melody ascends chromatically from the previously highest pitch D to D#, E, etc. The final pitch of this ascending trajectory is G in m. 8, which coincides with the beginning of the third phrase. However, one pc remains to complete the twelve-tone aggregate: pc 8, which appears displaced by an octave as Ab4 immediately following the G of m. 8. This octave displacement once again demonstrates Zappa's knowledge of the concept of pitch-class equivalence. Therefore, in Example 5.3, chromatic completion primarily occurs in pitch space, yet two important chromatic "gaps" are filled in pc space.

"Be-Bop Tango" (ECE/ACE 1973/1974b) manifests chromatic saturation and the gap-fill technique in several dimensions. An expectation for chromatic saturation is established in the introductory chord progression of the piece, which is presented as a reduction in Example 5.4a. This progression saturates the pitch space rather conventionally, via semitonal voice leading. The passage in question consists of a single chord progression, followed by its T2 transposition. The progression itself moves from a dominant-functioning chord (0237)—which could perhaps be analyzed an inverted V^{flat9}—to a tonic-functioning "augmented 11th" chord (0137). All four voices of the first chord move by semitone to their counterpart in the second chord. Extending this chromaticism, the T2 transposition of the progression allows each voice to create separately a four-note chromatic set (see Example 5.4b).[15] Such small-scale chromaticism sets the stage for more global processes of chromatic completion in “Be-Bop Tango,” the most significant of which is found in the progression of melodic cadential pitches throughout the piece. Example 5.5 provides the aforementioned cadential gestures, all of which occur at the conclusion of a phrase. As shown, the first two phrases of the piece terminate on pc 1, specifically C#/Db5. In the subsequent two phases, a closing B4 at m.14 gives way to the Bb a semitone lower in m. 16 of the following phrase: a connection made more aurally salient by the identical rhythms concluding both phrases. While Bb is maintained as the cadential pitch of m. 19, descending chromaticism continues in the phrase ending at m. 32, where Bb resolves to a sustained A. This A marks the lowest registral point of the chromatic space, as the following two phrases both maintain A as their cadential pitches. However, both of these cadences on A occur an octave higher than the pitches of preceding chromatic process, perhaps a signal of the conclusion of the pc descent. However, one factor remains to be “corrected,” specifically the chromatic gap that occurs between pc 1 of the first two phrases and pc 11 of the third phrase. The final phrase remedies the situation, providing the missing pc 0. Significantly, this C occurs in the same register as the cadence pitches of mm. 6–32, so that the chromatic completion occurs not only in pc-space but also as a true chromatic saturation of a certain segment of pitch space (A4 to C#5).

The previous examples show chromatic saturation achieved largely via semitonal voice leading within pitch space. However, Example 5.3 also included strategically-placed octave displacements, whereby chromatic saturation is achieved in a mixture of pitch and pitch-class space. In Zappa’s music, chromaticism most often functions within this more abstract pc-space, thereby mimicking to greater extent the nature of twelve-tone music. Further, chromaticism is

[15] This analytical point is also cited in William Morris Price, “An Original Composition, Symphony No. 1, Pollack, and an Analysis of the Evolution of Frank Zappa’s *Be-Bop Tango*,” dissertation, Louisiana State University, 2004.

usually confined to single melodic phrases, in which a large number, if not all, of the twelve pcs appear in fairly rapid succession. The general characteristics of such melodies, to which we now turn, can be witnessed in Example 5.6, mm. 17–19 of “Be-Bop Tango.” First, observe the general tendency towards pc diversity in the melody. In m. 17, six pcs are introduced <E21340> before a repeated pc (C#) appears at the end of the measure. In m. 18, eight distinct pcs occur in succession <03256874> before the recurrence of pc 6 towards the end of the measure. Within smaller segments (as indicated by the rhythmic groupings on the score), no pcs repeat. Most characteristic of this melody is the saturation of pc space by ic 1. As indicated by circled notes the example, only two pitches in this entire phrase are not involved in an ic 1 dyad with an adjacent pitch (the opening B and the E5 occurring on beat 3 of m. 18). As in “Waltz for Guitar,” most of these ic 1 dyads are realized in pitch space as pitch intervals 11 and 13 (as opposed to semitones). Such saturation by ic 1 is extremely common in the chromatic works, constituting an interesting counterpart to the saturation of diatonic space by ic 5 in the diatonic pieces. As for chromatic saturation, it is manifest in several guises. First, it occurs within each of the above-mentioned pc-diverse segments. That is, the first six pitches of the theme (before the repeat of C#) constitute a chromatic set 6-1; then, from that C# to the next repeated pc 6 in m. 18, a more extensive chromatic set 9-1 is formed. This larger chromatic set includes all pcs of the opening 5-1 segment except pc 11; when that pc appears at the end of m. 18, the overall chromatic saturation is expanded further with the introduction of the cadential Bb. In total, the phrase contains eleven of the possible twelve pcs, only lacking pc 9.[16]

While melodic chromatic techniques shown in Example 5.6 can be largely attributed to Zappa’s early interest in twelve-tone composition, the music of Varèse may have also served as a

[16] This missing pc 9 adds structural weight to the setting of A as the cadential pitch to the following phrase (see Example 5.5), where the preceding melody similarly contained all pcs except A.

model for employing chromaticism outside of the serial technique. Consider Example 5.7, the opening oboe melody of Varèse's *Octandre* (1924). This is a melody Zappa knew well, as it was quoted often in Zappa's concerts from 1967–69.[17] Besides sharing an improvisatory character with Example 5.6, the *Octandre* melody is likewise composed almost entirely of ic 1. The first measure of this theme establishes a four-note chromatic motive with the pc succession <6543>. Besides exhibiting wide-intervallic realizations of ic 1 (i.e., pitch intervals 11 and 13), another important aspect of the motive is its *pc descent*: the succession of pcs arranged in a numerically descending trajectory (mod 12). This pc descent creates the impetus for the continuation of the motive. Following the varied repetition of the main motive in mm. 2–3, the motive is isomelically varied at T8 in m. 4. This transposition allows for the continuation of the pc descent from <6543> of the main motive to <210E>. Similar to Zappa's processes of chromatic saturation, the complete twelve-tone aggregate does not appear to be the goal, as the pc descent is broken off soon after.

As evidence for the influence of Varèse, consider the chromatic structures of "Mo 'N' Herb's Vacation I" (ECE/ACE 1978/1983c), which almost exclusively exhibit the aforementioned pc-descent tendency for ic 1 realizations. As seen in the phrase given in Example 5.8a, almost every pitch of this melody is involved in an ic 1 dyad, as in Example 5.6. However, unlike Example 5.6, nearly all of these ic 1 intervals are set as either ordered pitch interval +11 or -13; therefore, each ic 1 individually exhibits a pc descent. Only towards the end the phrase do the ic 1 intervals congeal into an extended pc descent, when the pc succession <54321> occurs.[18] The importance of "pc-descending" ic-1 realizations to "Mo 'N' Herb's

[17] For a list of concerts in which *Octandre* was quoted, see http://www.zappateers.com/fzshows/6669.html.

[18] See also "Be-Bop Tango" mm. 15–16, where a long a series of discrete three-note segments, all exhibiting pc descent, appear towards the end of the phrase.

Vacation I" is further supported by Example 5.8b, a melody that recurs several times in the piece. As shown by the brackets on the example, the more "abstract" pc descent that characterizes the piece as a whole is replaced here by true descending semitone intervals; only the final ic 1 between pc 8 and 7 is set as pitch interval 11. Unlike Example 5.8a, these various chromatic segments combine to exhaust all twelve pcs.[19]

Another aspect of the Varèse example, its extended continuance of a pc descent, is observed at mm. 59–63 of "Pedro's Dowry" (ACE 1976/1979c). This music was analyzed in Chapter 3 for its progressive expansion of a septuplet rhythm from an L=1 to an L=3 dissonance. As shown in Example 5.9, the motive in question, which appears initially on beat 3 of m. 59, is both pc diverse and a chromatic set (7-1) created primarily via pc descents (i.e., <76>, <0E>, <98>). This motive is isomelically varied over the following measures. The emphasis placed on this chromatic set brings a greater degree of urgency to its continuation in m. 63. Like the primary motive, the quintuplet of m. 63 is pc diverse and composed of ic 1 successions, specifically the pc descent <5432>. Therefore, the pc succession of the quintuplet continues the chromaticism of the main motive. Specifically, the initial set class 7-1 is expanded to 11-1—only one pc shy of complete chromatic saturation. The overall trend towards pc-descending ic 1 realizations makes this relationship even more aurally salient, as the quintuplet is heard to continue a general descending trajectory from the septuplets <0ET9876> to <5432>.

Various transformations, particularly inversion, are often employed by Zappa in the service of local chromatic saturation. This technique is witnessed in the two phrases from "Mo 'N' Herb's Vacation I" shown in Example 5.10. The first of these (Example 5.10a) also occurs later in the piece in isomelic variation (see Chapter 2) and the second (Example 5.10b) acts as the

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[19] Another point of origin for the many descending ic 1 intervals in the piece may be the opening motive of the piece (based on a guitar solo), which begins with a descending semitone.

coda of the piece. In Example 5.10a, a motive is introduced on beat 1; it features the pc descents <T987> and <432> and is pc diverse. The motive is subsequently transformed by T1 and T5I on beats 2 and 3, respectively. Of these transformations, the inversion operation takes part in an extensive saturation of chromatic space. As shown, the two inversionally related motives on adjacent beats 2 and 3 exhaust all twelve pcs. Only pcs 8 and 9 are shared between beats 2 and 3. This dyad defines one of the axes of symmetry for T5I; therefore, pcs 8 and 9 map onto one another. This mapping is made apparent due to the fact that the dyad <98> and its inversion <89> occur at the corresponding positions of the quintuplet rhythm (as circled on the example). Example 5.10b is similarly motivically concentrated, consisting entirely of sextuplet rhythms. Here the motive does not appear in finalized form until beat 4 of m. 72. (Prior to this point, none of beats 1 through 3 have identical intervallic successions, though certain segments within them are related by transposition (as noted in the example).) For the first sextuplet of m. 72, the chromatic set 5-1 is created. However, in this form, the motive does not feature pc diversity (repeating Bb). When the motive is finalized at beat 4, it is entirely composed of discrete ic 1 dyads and is pc diverse, yet it is *not* entirely chromatic. Thereafter, all sextuplets residing on adjacent beats are inversionally related, with the last two pitches of the motive set in an RI realization. These adjacent inversionally-related sextuplets combine to create chromatic sets, thereby “filling-in” the pc gaps within the finalized motive. The most extensive of these chromatic sets is that between beats 1 and 2 of m. 73 (10-1). This larger segment is immediately transposed at T7 to complete the coda. Not surprisingly, this T7 transformation allows for the exhaustion of all twelve pcs in m. 73.

The techniques of chromatic saturation detailed above also occur at times between non-adjacent segments in Zappa’s music. In the B section of “Manx Needs Women” (ECE

1976/1978a) (see Example 5.11), both adjacent and non-adjacent chromatic processes interact.[20] As for adjacent chromaticism, the first two measures of the example combine to the chromatic set 10-1, while the last two measures feature all twelve pcs. The concept of pc diversity is especially applicable to the latter, wherein all twelve pcs appear within thirteen articulated notes (E is the only pc repetition). A process of non-adjacent chromaticism between m. 1 and m. 3 can also be seen to contribute to the aforementioned completion of the aggregate. These measures are (mostly) intervallic inversions of one another, related at T0I. This transformation allows for the retention of five common tones, of which the pair F-G—pitches that map onto one another under T0I—is particularly important. As can be seen, these two pitches are used to initiate both measures, each time in the order G-F (which causes these pitches to relate as RI). Because m. 1 and m. 3 share five common tones, the chromatic set of m. 1 is only extended by one pc, namely A. However, the high number of common tones also allows us to hear m. 1 as contributing to the process of *complete* aggregate completion. As detailed at the bottom of the example, m. 1 establishes the pc collection {345678}, to which m. 3 adds pc 9. The remaining segment of music, beginning on C4 at the end of m. 3, completes the chromatic in as few pitches as possible, adding pcs {TE012}. Of course, this reading relegates m. 2 to a more subsidiary role, but this interpretive decision is supported by the highlighted inversional relationship between m. 1 and m. 3.

Our final example of chromatic saturation demonstrates how chromatic processes can occur not only between non-adjacent segments *within* a single phrase, but also *between* phrases. Example 5.12 provides the beginnings of two adjacent phrases from “Be-Bop Tango.” One will observe that both phrases begin with the same pitch (G#5) and are rhythmically identical for the

[20] This music constitutes the entirety of the B section of “Manx Needs Women.” It is repeated in various textures three times.

first two beats—similarities that allow us to hear these two phrases as being in close relation. For both phrases, segmentations are chosen primarily in accordance with IOI value. Our first expectation is that pc successions within a single IOI will be pc diverse. However, the first of the phrases violates this expectation, as the pitch E recurs within the quintuplet IOI and the pitch Bb returns within the septuplet. These repetitions limit the degree of chromatic saturation that may occur within these segments; the set created by the quintuplet IOI thereby achieves its maximum saturation of 8-1, while the pitches of the septuplet are of set-class 4-1. In the second of the phrases, beginning at m. 33, the violations of pc diversification in the first phrase are corrected, as the entire quintuplet span is pc diverse, as well is the segment created between the triplet and "gapped" quintuplet on beats 3 and 4.[21] Not only do these segments exhibit pc diversity, but they also extend the chromatic segments defined in the preceding phrase. As shown, both segments add one pc to the corresponding sets of the previous phrase. The pcs of beats 1 and 2 thereby form set-class 9-1 with the addition of pc 0 while beats 3 and 4 expand the 4-1 of the septuplet in the first phrase to 5-1 with the addition of G#. The process of chromatic expansion between the first two beats of both phrases is especially easy to hear, as the second quintuplet of each of these phrases has identical pc content: {34567}. Incidentally, the modifications made to the second of the phrases has little consequence in terms of complete chromatic completion. That is, both phrases individually exhaust all twelve pcs in the same number of articulated pitches (13). Interestingly, this chromatic saturation is each time achieved with pc 9. In sum, therefore, both phrases are initiated with pc 8 and exhaust all twelve pcs thirteen notes later on pc 9.

[21] The triplet and "gapped" quintuplet are included within the same segment due to their very close IOI.

3. Symmetry.

The final topic of discussion in this section is symmetry (inversional or otherwise) in the chromatic music. I have already detailed several uses of inversion under the preceding topic, where it was occasionally employed in service of chromatic saturation. While symmetry is certainly a less pervasive consideration in this repertoire than chromatic saturation, it nevertheless remains significant insofar as symmetry does not appear to any substantial degree in the diatonic works, and is therefore reserved for music in which all twelve pcs are available. Therefore, we can assume that Zappa's knowledge of inversion and/or symmetry came from his studies of post-tonal music (perhaps especially the music of Webern), and not from any tonal uses of inversion (e.g., Bach fugues). The following examples will demonstrate that symmetry is an important, but nevertheless secondary, element of Zappa's chromatic works. As we will see, Zappa's tendency of subverting the realization of completely symmetrical formations suggests that he was unwilling to follow the model of Webern, whose music is more comprehensively concerned with symmetry. Therefore, similar to Zappa's unique hybrid approach to aggregate completion, whereby some general features of twelve-note composition are appropriated within a non-systemic context, symmetry is a fairly flexible consideration in Zappa's music, appearing in several guises.

The introduction to the ECE version of "Dupree's Paradise" (1973/1988c), which makes extensive use of inversion, is representative of some of the idiosyncrasies that often exist in Zappa's symmetrical structures. As Example 5.13a shows, a pattern of T5 transpositions controls the music at the highest level. Within each transposed segment lie two eight-note segments that are intervallic inversions of one another. As can be seen by investigating the first large segment (beats 1 and 2), however, there are slight abnormalities in the inversion, as the ordered pitch-class interval series of the first eight notes (1-7-5-3-7-8-E) is not precisely inverted by the second (E-5-E-5-5-5-E). The pitches that cause these discrepancies are indicated by an asterisk on the example. Only one of these pitches, G5, is "problematic" in terms of the T3I operation that relates the two segments; the other asterisked pitches, Db-C and Eb-D, are merely RI related.[22] If this G5 were altered to Eb5, the two segments would be complete intervallic inversions under T3I. Example 5.13b shows an "idealized" version of the first large segment, wherein G5 is changed to Eb and the RI related pitches are reversed in order, thereby preserving the I relation. One wonders why Zappa chose to maintain this "problem" pitch, as it similarly violates the principle of pitch diversity within the first eight-note segment, causing a repeated pc 7.

The habit of slightly throwing off symmetries, as detailed in the example given above, is common to Zappa. A prime example of this tendency is shown in Example 5.14, the theme from the interlude to "Jumbo Go Away" (ECE/ACE 1979/1981c). As described in Chapter 2, this theme recurs several times in the piece in isomelic variation. Considering the first statement of the theme (Example 5.14a), there is little in terms of rhythmic presentation that suggests symmetry. However, on closer inspection, the first nine pitches of the theme are mostly RI related (at T4I) to the last nine pitches. Pitches that obstruct this relation are marked with an asterisk. One of these, the F natural in the second full measure, is certainly a modification of an F#—a pitch that would maintain the RI relation.[23] In fact, in the third isomelic variation of the theme, this note appears as the "correct" F# (see Chapter 2). Similarly, the final Db should be heard as an alteration of an expected D natural. This semitonal displacement is carried out to

[22] In some of the earlier examples of inversion discussed in this chapter, one will recall that Zappa similarly reversed the order of two of the pitches within an inversion, thereby creating an RI relationship.

[23] This modification was likely made for aesthetic reasons known only to Zappa.

prepare for the immediately following isomelic variation, which is a T11 transposition of the first statement, and thereby beginning on that same Db. The non-conforming pitch G, however, is an integral element of the structure of the theme. As can be seen, the pitches D and G alternate at regular intervals within the pitch sequence—one of these pitches occurs every three notes. These pitches are also the only "white-key notes" in the theme, as all pitches occurring between these white notes are "black key" pentatonic thirds (save of course for the altered F# of m. 2). Therefore, an opposition is created between the oscillating D and G and the black key pitches.[24] Example 5.14b provides an "idealized" version of the pitch sequence of the theme, replacing the altered notes so that the RI relation is maintained. Now, only G natural does not partake in the symmetry; the pitch D, however, is central to the symmetrical structure, acting as the axis of inversion around which the pentatonic thirds map onto one another in pitch space.

Our next example, from the ACE version of "Sinister Footwear II" (1984/unreleased), demonstrates how symmetry can unfold not only in pc space, but also in contour space (see Example 5.15). This three-measure segment functions as a short link in the piece. The melody, shown on the top staff of Example 5.15a, is organized in three smaller segments, represented by the notated measures. In the first measure of the example (m. 139), the melody ascends stepwise through the "white notes" from B4 to B5; similarly, the melody descends stepwise through the white notes from A5 to A4 in the final measure (m. 141). The central measure (m. 140) functions to complete the chromatic by featuring all the "black key" pitches absent from m. 139 and m. 141. (Interestingly, this central measure also seems to recall the white-note-versus-black-note dichotomy of the interlude to "Jumbo Go Away" [see immediately preceding example]. In

[24] Zappa was apparently well aware of this relation, as evidenced by an interview with keyboardist Tommy Mars, who humorously recounts Zappa advising him to play the white notes with the left hand and black notes with the right hand (whereas Mars was attempting to play all pitches with the right hand). See *T'Mershi Duween*, #61, October 1997.

fact, the pitch pattern produced in m. 140, wherein two black key "pentatonic thirds" are followed by either of the white notes D or G, is precisely that of "Jumbo Go Away.") Throughout the passage, the melody is tracked below by two pitches creating sus-4 sonorities with the melody (see middle staff). The bass register, however, exhibits greater freedom in its harmonization of the melody. In the first measure, it alternates between (0237) and (0257) harmonizations: all pitches articulated on odd pulses of the measure being (0237) and all pitches on even pulses (0257). In the same manner, the bass pitches of m. 3 alternate between (0237) and (0247) harmonizations. The bass harmonization in the central measure, however, is more erratic.

As shown, the shared patterns of alternation between m. 139 and m. 141 create R and I relations between the two measures in contour space, as the CSEG of m. 1, <03152647>, is both the retrograde and the inversion of the <74625130> CSEG of m. 3. (This same R and I relationship also holds in the melody, but is more difficult to conceptualize therein.) Looking more closely at the bass part of m. 139 (see Example 5.15b), we can see that the R and I symmetry between m. 139 and m. 141 occurs as a result of the inherent symmetry of the contour of this measure. As is indicated, this contour, <03152647>, is RI symmetrical in contour space, with the "CSEG axis" occurring between contour pitches 5 and 2. The pitches that define this axis, B and F#, are crucial to all the symmetrical relations found in the bass register of Example 5.15. In all three measures, these pitches are stated at the central fourth and fifth eighth notes of the measure, and in each measure these pitches define the axis. The contour of m. 141 achieves this symmetry as does that of m. 139, in relation to an RI-symmetrical CSEG. In the central measure (m. 140), however, this RI-symmetry becomes even more abstract. As shown in Example 5.15c, here RI-symmetry occurs in terms of the more general CAS (contour adjacency series). The CAS of m. 3, <-, -, +, -, +, -, -> is RI symmetrical, wherein the central <-> contour between the pitches B and F# constitutes the axis of symmetry.[25]

For our final example of symmetry in Zappa's music, we return to "The Eric Dolphy Memorial Barbecue" (see Example 5.16). The phrase in question manifests a tightly organized isomelic structure, the contents of which are important in the unfolding of a symmetrical relation across the piece. It consists of the pc-diverse pitch sequence <39T482076>, whereby a complete run-through of the sequence is sandwiched by two halves of the pitch sequence: pitches #1–#4 and #5–#9. These smaller segments, which congeal to create a full statement of the pitch sequence, are isomelic variations of the central uninterrupted statement. This isomelic structure is maintained in Example 5.16b, itself an isomelic variation of Example 5.16a, which appears at the very end of the piece. One notable melodic modification distinguishes this variation, namely the introduction of a tenth note to the pitch sequence (C#, maintaining pc diversity). The addition of C# is particularly salient due to its relative lowness in register as well as the agogic accent it receives. Example 5.16c interprets the significance of this addition. As shown, the C# allows for a set-class equivalency between the first four notes of the melody and the last four notes. This set, (0167), is particularly emphasized in the setting of the first four notes of Example 5.16b, where it is stated three times in groups of four sixteenth notes. Not only does C# create an additional (0167) set, but this set is presented as the retrograde inversion of the first (0167), under T4I. Two of the pitches of the second (0167) appear out of order, the semitone interval G-F#, which is thereby I-related to the semitone A-Bb of the first (0167).[26] Furthering the RI symmetry of the pitch sequence, G#-D, the axial pitches for the inversion under which the

[25] This same type of RI-symmetry is present in the melody of m. 2 of the example (i.e., m. 139).

[26] The reversal of RI-related pitches can be seen to counterbalance Zappa above-cited tendency to reverse certain pitches within a larger inversional relationship.

two (0167) sets map, are presented between the (0167) sets, reflecting their role as axes within the symmetrical formation.

Transition to Part II: Harmonic issues in the chromatic works.

As stated at the beginning of this chapter, pure chromaticism is most prevalent in Zappa's melodic lines. Having now detailed the general features of these melodies, we begin to turn to a discussion of non-diatonic music incorporating scales. Before doing so, however, we must first acknowledge some aspects of the approach to harmonic accompaniment in the works discussed thus far. As will be shown in the following section, the difficulty of integrating such chromatic melodies within a harmonic framework may have contributed to the incorporation of scalar structures in Zappa's non-tonal music.

As a point of comparison for this discussion, let us consider how Zappa accompanies the chromatic main theme of "Be-Bop Tango." As shown earlier in Example 5.4, the introduction to this piece features two four-note harmonies, the first a member of (0236) and the second of (0137). In this initial context, the chord successions are vaguely functional, with the first dominant-functioning (0236) chord heard to resolve chromatically to the following (0137). Once the chromatic melody enters, two aspects of the opening progression are continued: (1) the exclusive use of four-note chords; and (2) chords of set types (0236) and (0137), as twenty one of the thirty six chords that occur throughout the piece are of either of these set types. Example 5.17 provides both the main theme of the piece (Example 5.17a) and the first isomelic variation of the theme (Example 5.17b). As can be seen, chords of set type (0137) and (0236) comprise nearly all of the harmonies for both of the phrases. However, chord successions are no longer arranged in a manner that suggests functionality or resolution. For example, in Example 5.17a, the succession from the first (0137) chord to the following (0236) chord does not contain the requisite chromatic voice leading that characterized the introduction. Accordingly, the two chords are not heard to exhibit a dominant-tonic relationship (or, here, tonic-dominant). Neither does the (0236) chord, which was interpreted as an inverted V^{flat9} chord in Example 5.4, resolve to the cadential (0146) chord. In Example 5.17b, (0137) and (0236) are not even placed in close succession; in m. 13, two different (0137) chords alternate, while in m. 14, two (0236) chords related at T11 are placed side-by-side.

Of more fundamental importance than the aforementioned non-functional employment of (0137) and (0236), the harmonies of both phrases of Example 5.17 have no clear tonal relationship to the melody. Considering the fact that both phrases contain the "same" melody, this point is confirmed first by observing that *only* the opening chord (D-C-Eb-Ab) is shared by both phrases. Additionally, none of the accompanying chords participate in the chromatic processes of the melody. Similar to the examples discussed in the previous section, this theme contains various chromatic segments—here, two adjacent (01234) segments—that combine to create a larger chromatic set. Though the combined pc content in the accompaniments of both phrases is often large, nothing therein influences the chromatic events of the melody. The (0137) and (0236) chords merely provide coloration to the predominant melody. Accompaniment and melody are thereby separated both texturally and tonally. While such textural stratification was an important aspect in the diatonic works, there nevertheless existed an important tonal relationship between the sonorities in the accompanying layers and the pitch collection of the melodic layer. In "Be-Bop Tango," on the other hand, melody and accompaniment are truly independent elements. This opposition between harmony and melody is characteristic of most of Zappa's chromatic works discussed above. Comparing "Be-Bop Tango" with the piece "Pedro's

Dowry" (ACE 1976/1979c), for example, one need only substitute the (0137) and (0236) chords of the former with larger "cluster" chords of the latter. Sometime around 1977, Zappa began searching for a method to better integrate his non-diatonic melodies with their chordal accompaniments. His solution to this harmonic "problem" was the *Chord Bible*, a topic that will comprise the remainder of this chapter.

II. Scalar non-diatonicism: The Chord Bible.

A. Introduction to the "Chord Bible."

One result of Zappa's score studies at college was the development of an admiration for Varèse's method of chordal construction. As he stated to a Finnish TV interviewer in 1974, one aspect of these chords that especially impressed him was their varied pitch-space realizations:

> So, if you're writing for a group of instruments, and each person in that group gets to play one note of the chord, that gives you a chance to make the chord any *density* that you like. It can be like this [holds hands parallel a foot apart], it can be like that [holds hands close] or it can be spread out like that [stretches hands a yard apart]. And you can only do that by working with many instruments and different tone colors, and so that's what I've come to appreciate especially in the writing of Varèse—the tone color and the voicings of the chords.[27]

Varèse's exploitation of registral space has long been identified as one of the trademarks of his compositional practice. Bernard's theoretical work on Varèse, in particular, has been primarily concerned with matters of pitch space (as opposed to pc space).[28] Among the types of chordal formations that likely influenced Zappa, consider Example 5.18, which occurs towards the end of rehearsal 2 in Varèse's *Intégrales* (1924–25). Here, a chord covering nearly six octaves is created between the instruments of the wind ensemble—each instrument sounding one pitch. The registral arrangement of the pitches within the chord is certainly primary to the sonic effect

[27] TV2, Finland, October 3, 1974.

[28] Jonathan W. Bernard, *The Music of Edgard Varèse* (New Haven: Yale University Press, 1987).

of the chord—pitch space has priority over pc space in this circumstance. However, an additional aspect of Varèse's approach to sonority—one that must have similarly influenced Zappa—is the tendency towards pc diversity. In the eleven-note chord of Example 5.18, for example, eleven distinct pcs are sounded: a clear indication that pc diversity must have been one the constructive principles at work. As will be seen, both pitch-space and pc attributes will be central to Zappa's harmonic system.

As implied by the quote given above, Zappa saw the greatest potential for exploiting chordal writing in orchestral scoring, which offered greater variety in tone color and instrumentation. Therefore, the impetus for a more systematic approach to chords arose in part from his interest in composing orchestral scores. The system ultimately devised by Zappa was a catalogue of favorite chords he termed "The Chord Bible." It was certainly a boon to his creativity, resulting in the greatest out-pouring of orchestral composition in his career. These titles were likely composed between 1977 and 1982; most were subsequently recorded in 1983 and 1984 and can be heard on the albums *London Symphony Orchestra* (1983) and *The Perfect Stranger* (1984), under the batons of Kent Nagano and Pierre Boulez, respectively.[29] As we will see, certain aspects of the Chord Bible found their way into various ECE pieces composed during the aforementioned time span. After this period, Zappa's interest in the Chord Bible seems to have waned. In 1983, he purchased the Synclavier, in which the contents of the Chord Bible were subsequently entered.[30] It is likely, then, that the chords of the Chord Bible are also heard

[29] Also within this repertoire is the unrecorded three-movement orchestral score *Sinister Footwear*. Of course, earlier-composed pieces that were given updated performances on these albums, such as "Naval Aviation in Art?," "Pedro's Dowry," "Bogus Pomp," and "Strictly Genteel," do not utilize the same harmonic system.

[30] David Ocker, personal email correspondence, February 21, 2008.

in certain Synclavier works.[31] Most likely, the possibilities afforded by the Synclavier caused Zappa to loose interest in the Chord Bible. David Ocker, Zappa's copyist during the time span in question, notes that "when the Synclavier arrived, this system [the Chord Bible] was soon forgotten."[32]

Because the Chord Bible itself is not available to the analyst, its contents can be deduced only through a close study and cataloguing of the harmonies found in those titles composed circa 1977–82. Zappa's only description of the book itself is given below:

> Every composer has notes, chords, and rhythms that he likes to hear. Some people keep it all in their head and some people will jot down little sketches. Several years ago I made a classification of all of my favorite chords plus the order in which I preferred to hear the pitches in the chord arpeggiated. It's all broken down from three-note, four-note, five-note, six-note, eight-note chords. The chords are in different classifications, starting with those chords that have a minor second as the uppermost interval, major second, minor third, blah blah blah, all the way down to the fewest chords that have a minor ninth as the upper interval of the chord. There are real dense-voiced chords and chords that cover four or five octaves.[33]

Because this description indicates only the manner in which chords were classified, it provides little substantive information for the analyst. Many questions remain regarding the pitch resources that furnished such chords, their pitch-space realizations, and their employment in musical contexts.

The following section will aim to address many of these hanging questions. I will not attempt to completely reconstruct the Chord Bible, but will instead focus on those aspects of the Chord Bible that can be confidently ascertained from studying the chordal structures employed in the works under discussion. The repertoire for this investigation includes the following ACE works: "Envelopes," the orchestral "Sinister Footwear" (three movements), "The Perfect

[31] Zappa cites their use in the piece "The Beltway Bandits" from the 1986 Synclavier album *Jazz From Hell*. However, he also states that the piece is "a really old one," indicating that it was composed much earlier than 1986. Jeff Spurrier, "Zappa on Jazz From Hell," *Music & Sound Output*, March 1987.

[32] David Ocker, internet interview, 1994 and 1995. http://members.cox.net/bill_lantz/pages/ocker.html.

[33] Spurrier, 1987.

Stranger," and "Dupree's Paradise." My discussion will focus primarily on seven- and eight-note chords, as they are the most prevalent in these works, and were likely the starting point for Zappa's experiments. Because all of the aforementioned pieces contain hundreds of chords, it is often possible to confirm safely a chord's status as a member of the Chord Bible (i.e., through its repeated usage across different pieces). However, certain chords which appear only once—or perhaps several times but in only one piece—will not be included in the catalogue of chords.[34] Further, a discussion of three-to-six-note chords is currently premature, as they are used much more sparingly and much less consistently. One would assume that all such chords found in these works are members of the Chord-Bible, but extra confirmation is required for the analyst to make this assumption in confidence. That having been said, chords with cardinalities lower than seven will be found in several of the musical examples throughout the rest of this chapter. Through these examples, some preliminary findings can be shared.

In the following section, the chords of the Chord Bible will be discussed according to two characteristics: their scalar resources and their *density*. The term "density" refers to the pitch-space realization of a given chord. Evidence suggests that Zappa himself used this term (perhaps as a light homage to Varèse's *Density 21.5* for solo flute (1936)). For example, guitarist Steve Vai, who was under Zappa's employment for most of this period, recalls approaching Zappa while in the process of composing with the Chord Bible:

> I sat down next to him [at an airport]. "These are 'densities,' he said," and showed me these huge, odd chord structures, eight- and ten-note chords with no repeated notes. . . . If you start stacking large groups of unrelated notes, you can get some horrible-sounding chords, or some lushly, exotic chordal perversions.[35]

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[34] Because errors do occur in the scores, one cannot be certain that such chords are not the result of copying mistakes.

[35] Andy Aledort, "Zappa's Universe: An Interview with Steve Vai and Mike Keneally," *Guitar Player*, February 1999.

A given density will be labeled according to the intervals (in semitones) between adjacent notes of the chord, beginning with the lowest note. For example, a chord consisting of the notes C1, D1, G1, and F#2 will be labeled D[2-5-11], the "D" prefix standing for "density."[36] In musical examples, the numerals indicating intervals will often be stacked vertically. Typically, adjacent notes do not extend past the interval of an octave; for those chords that are *consistently* voiced with certain pitches further than an octave apart, the precise semitonal space will be reflected in the density label (i.e, D[7-13-15]).

B. Scalar resources and chordal densities of the Chord Bible.

In this section, I will detail the principles of chordal construction for the chords of the Chord Bible. I have divided the discussion according to the various scalar resources from which the chords are derived. In each section, I will describe the general importance or issues relevant to the given scalar resource in Zappa's music and will then proceed to provide a preliminary listing of Chord-Bible harmonies most commonly used in Zappa's orchestral music.

1. Diatonic chords.

The reader may understandably be confused to see the term "diatonic" appear in this chapter. As musical examples are presented, the logic of the inclusion of diatonic chords in a chapter on "non-diatonic music" will become apparent. In fact, it is quite likely that the construction of the Chord Bible began with diatonic chords. The methods of construction for these chords, then, served as a model for subsequently added non-diatonic chords. Foremost, the diatonic scale provides a pitch collection tailor-made for seven-note chords. As described above,

[36] The density label provides the same information as Robert Morris's SP(X). See Robert Morris, "Equivalence and Similarity in Pitch and their Interaction with Pcset Theory," *Journal of Music Theory* 39/2 (1995): 207–239.

one aspect of Varèse's harmony that interested Zappa was its lack of repeated notes within chords. Utilizing the seven-note diatonic scale, constructing seven-note chords becomes an easy task. Zappa described the process in 1979 (also demonstrating two of the most-commonly found diatonic chords):

> The stuff that I'm working with now is seven-part harmony with no notes doubled. And most of the orchestra stuff is based on that. In other words, if you take any kind of diatonic scale, it contains seven notes, and there are ways of spacing those seven notes so that at all times you're playing the entire scale. But you can make it sound like chords instead of blurs. Want to hear an example? I'll play you a beautiful seven-note chord. If you take a C-major scale, it sounds like this . . . . That's spread out over an octave and a fifth. See, it's spelled E-F-A-C-D-G-B . . . . The other thing I worked out is chords built in fifths. You build fifths plus one third, and that will also give you seven notes. Here's an example. That's C-E-B-F#-G-D-A.[37]

Example 5.19 offers a catalogue of the diatonic chords that are employed most often in the pieces in question.[38] The diatonic collection used to represent all chords is that of the F-Lydian system. As can be seen, nearly all the diatonic chords feature either the Lydian pedal or the Dorian pedal as their lowest pitch—a fact that provides further evidence of the special status that these two scales hold in Zappa's music (as discussed in Chapter 4). Accordingly, the example classifies all chords into one of two families: Lydian chords (Example 5.19a) and Dorian chords (Example 5.19b).

Looking in greater detail at the Lydian chords of Example 5.29a, one finds two of the chords listed as "primary chords." These chords gain this status not only for their heavy use in actual pieces, but also for their role in generating additional chords. Primary chord 1 is the "chord in fifths" described by Zappa in the quote above, with a density D[4-7-7-1-7-7]. The (027) set-class so central to the diatonic works is featured in this chord. Specifically, two quintal realizations of (027), A-E-B and C-G-D, are stacked above the Lydian pedal. Beside this primary chord on the example are two "derived chords," created by some modification made to

[37] Dan Forte, "Interview with Frank Zappa," *Musician* 19, August 1979.

[38] While other diatonic chords not listed are found in these works, they do not meet the criteria for inclusion outlined above. We will, however, find some of these additional chords in the analytical examples of this chapter.

the primary chord. For the first derived chord, D[4-7-7-1-2-5], the uppermost quintal structure of primary chord 1 is altered to a sus-2 formation C-D-G. A similar process describes the final derived chord of primary chord 1, D[11-5-2-1-2-5]. Here, the upper sus-2 of D[4-7-7-1-2-5] is retained, while the lower quintal A-E-B becomes a sus-4 formation E-A-B. The (027) structures of primary chord 1 figure heavily in the diatonic chords, including those of cardinalities lower than seven. Consider, for example, the chord succession at m. 138 from "Sinister Footwear II" (ACE 1984, unreleased), which exclusively employs six-note chords (see Example 5.20). Considering the discrete three-note segments of all of these chords (separated visually by the bass and treble clef), almost all are set-class (027), save for the two set-classes (037) labeled on the example.[39]

The structure of primary chord 2 of the Lydian family (Example 5.19a) also relates to some of the findings presented in Chapter 4. This chord, D[11-5-3-2-5-4], is analyzed in the example as containing an F-major-seventh chord in its lower structure and a G-major chord in the upper structure. As will be recalled from Chapter 4, the major chord built on scale-degree two of the Lydian scale, which contains the characteristic sharp fourth, often features prominently in Zappa's diatonic works, being either superimposed over the Lydian pedal or placed in opposition to the Lydian-tonic triad in the L/M progression. The derived chords of primary chord 2 all retain this basic structure, though they often rearrange the chord members within each segment (see D[E-5-T-4-1-2] and D[7-4-5-2-3-5].

[39] The first chord of the progression, D[7-7-1-7-7], is clearly a six-note segment of primary chord 1, D[4-7-7-1-7-7]. This is one of the few chords with a cardinality lower than seven that appears in several pieces, and is therefore one of the confirmed six-note chords of the Chord Bible. The status of the remaining chords of Example 5.20 is less secure. The fourth chord, for example, contains a pitch repetition (C#), thereby violating one of the principles of chord construction. Some others do appear to be segments of the seven-note diatonic chords that I have identified. The final D[5-2-1-5-2], for example, is a six-note segment of the unconfirmed seven-note D[2-5-2-1-5-2], which appears three times in the piece "Envelopes."

The derivative chord D[1-4-3-2-5-4] of primary chord 2 features the most similar density to that of the primary chord. The density of this chord is achieved through the octave transfer of the lowest pitch of primary chord 2 (F in the example) up an octave, which results in a lowest note of E, one of the leading tones of F Lydian. Given the semitone pitch interval at the bottom of this chord, the lowest note E is not strong enough to usurp the Lydian interpretation of the chord. That is, one will not hear D[1-4-3-2-5-4] as a Phrygian chord. Confirmation of this point is found in the treatment of the theme to the orchestral "Dupree's Paradise" (ACE 1984a). From Chapter 4, we know the ECE version of this theme to be in E Lydian. In the orchestral version, the theme appears twice, first at m. 9 (Example 5.21a) and later at m. 54 (Example 5.21b) transposed by T1. As can be seen, both statements are harmonized by derivatives of primary chord 2 of the Lydian family. While statement one is harmonized by a chord with the Lydian pedal E as its lowest note, D[7-4-5-2-3-5], the second F-Lydian statement employs D[1-4-3-2-5-4], which, as just noted, sets the leading tone as its lowest pitch. The logic behind this chord choice seems to be common-tone retention, as the accompanying chords for both statements have E as their lowest note. In fact, this common tone is heard quite clearly, as statement two is immediately preceded by the same D[7-4-5-2-3-5] chord from statement one.

The Dorian-chord family, shown in Example 5.19b, has fewer confirmed chords than the Lydian family. Only one primary chord is identified, D[7-7-1-7-7-4]. Its derivative, D[T-5-2-1-2-5], is arrived at through a somewhat convoluted process, as shown on the example. Similar to methods found in the Lydian family, the quintal structures of D[7-7-1-7-7-4], D-A-E and F-C-G, are modified to the sus-4 A-D-E and sus-2 F-G-C, respectively. Then, the remaining pitch B is transferred from the highest note in the primary chord to the lowest note in the derived chord.

The Dorian-chord family also features the diatonic chord with the widest octave span, D[2-1-7-11-T-T], which covers three octaves and a fourth.

Dorian chords D[7-7-1-7-7-4] and D[3-7-7-2-7-7] are linked in their heavy usage of stacked fifths. Accordingly, these chords can actually be viewed as derivatives of primary chord 1 of the *Lydian* family, D[4-7-7-1-7-7]. Example 5.22 compares the Lydian primary chord D[4-7-7-1-7-7] with the two Dorian chords under discussion. In Example 5.22a, chord D[3-7-7-2-7-7] is shown to have the same "generic-interval" structure as D[4-7-7-1-7-7] (e.g, third as opposed to major or minor third). That is, both chords consist of the following generic-interval succession: third-fifth-fifth-second-fifth-fifth. More interesting is the relationship between D[4-7-7-1-7-7] and D[7-7-1-7-7-4] (see Example 5.22b). These two chords are pitch-space inversions of one another. This property is a realization of the inversional relationship between Lydian and Dorian discussed in Chapter 4. **(**Therein, it was observed that the extended-tertian spectra above Lydian and Dorian pedals were pitch-space inversions, a similitude contributing to those modes' special status as characteristic major and minor modes.) Example 5.22b indicates the inversional mappings about the axis D between the pitches of these two chords within the F-Lydian system. Given that D[4-7-7-1-7-7] and D[7-7-1-7-7-4] are the most-commonly encountered diatonic chords in this repertoire, this relationship becomes of even greater import. Zappa's knowledge of the kinship between these two chords is evident in his common practice of placing these two chords side-by-side, or in very close proximity, in actual musical contexts.

2. Minor Lydian chords.

The second scalar resource for the seven-note chords is new to our discussion. In the repertoire in question, this scale far exceeds the diatonic scale in importance. Accordingly, it is deserving of a more extended discussion than the remaining scalar resources detailed within this section. In fact, one could claim that this scale provides the characteristic sound of much of Zappa's music during this period. One description of the scale is found in an interview with Zappa's keyboardist Tommy Mars, in explanation of some of the harmonic features of the piece "Sinister Footwear 2" (to be discussed below):

> Frank and I both, before I joined the band, were great fans of the *Minor Lydian*. This is a polytonal concept. If you have a C-minor [chord] on the bottom and a D-major [chord] on the top, that's a Lydian chord [sic] with the tritone in it.[40]

Though Mars describes the Minor Lydian merely as a chord, Zappa in fact employed it in the form of seven-note scale. Example 5.23 identifies two scalar forms of the Minor Lydian utilized by Zappa. The first of these, "Minor Lydian (1)" (Example 5.23a), is equivalent to a Dorian scale with a raised fourth, while "Minor Lydian (2)" (Example 5.23b) is the same as a Lydian scale with a lowered third. Accordingly, both forms of the Minor Lydian can be conceptualized as diatonic scales with one chromatic alteration each. This chromatic pitch results in the characteristic augmented second interval between the third and fourth scale-degrees of the Minor Lydian[41]; further, it insures that neither form of the Minor Lydian is diatonic—given that one reserves the term "diatonic" strictly for set-class (013568T). Rather, both forms are set-class (0134689), related to one another by inversion. This inversional relationship is

[40] Mars cites jazz-pianist Erroll Garner with introducing him to the chord. It is not certain whether Zappa's interest in the "Minor Lydian" had similar jazz origins or if Mars himself was responsible for first making it known to Zappa. The opening sentence of Mars's above-given quote has more than one possible interpretation (i.e., either Mars was a fan of the Minor Lydian before joining the band or *both* Zappa and Mars new of it before he joined in 1977.) The term "Minor Lydian" seems to originate with Mars. Evil Prince (pseudonym), "Mars Needs Evil Princes," *T'Mershi Duween* 61, October 1997.

[41] The existence of this augmented second may explain why the Minor Lydian is not listed as a traditional jazz scale. That is, most jazz scales, including of course the diatonic modes, do not feature ascending scale steps larger than one or two semitones. This feature makes them well-suited for improvisation. Dimitri Tymoczko, in his discussion of the scalar practice in post-common-practice music, states this tendency as one of his three "scalar constraints," which he terms the "diatonic seconds" constraint. It is worded as follows: "If the scalar interval between two notes is one ascending step, then the chromatic interval between them is either one or two ascending semitones." The Minor Lydian scale clearly violates this constraint. Dimitri Tymoczko, "Scale Networks and Debussy," *Journal of Music Theory* 48/1 (2004): 219–294.

significant when Minor Lydian is viewed through the prism of the Lydian theory of Chapter 4. In Example 5.23, Minor Lydian (1) and (2) are respectively represented as alterations of Dorian and Lydian within the same Lydian system (in the example, F-Lydian). When represented as such, these two forms of the Minor Lydian hold the identical inversional relationship as their diatonic counterparts in the F-Lydian system. That is, while D Dorian and F Lydian map onto one another (or onto themselves) about the axis D-G#, so do D Minor Lydian (1) and F Minor Lydian (2). This mapping is shown in Example 5.24. As in the diatonic system, the inversional relationship between the two forms of Minor Lydian is seen most clearly when both scales are represented as stacked thirds, as they will be pitch-space inversions of one another in that form. Thereby, the lowest note of D Minor Lydian (1) will map onto the highest note of F Minor Lydian (2), and so on. Interestingly, this mapping allows the two "chromatic" pitches of the Minor Lydian, G#/Ab, to map onto one another.

In simpler terms, the two forms of the Minor Lydian can be distinguished by their respective seventh scale degrees. That is, Minor Lydian (1) has a "lowered" seventh while Minor Lydian (2) has a "raised" seventh. One finds both forms of the scale employed in the piece "Drowning Witch" (ECE 1981/1982). In Example 5.25, two separate passages are provided, both consisting of accompaniments which feature a single minor triad throughout (F minor in Example 5.25a and F# minor in Example 5.25b). In previously-encountered situations, such an accompaniment would be paired with the Dorian scale; here, the Minor-Lydian (1) is primarily employed. Recalling Mars's description, observe that both passages begin melodically by outlining the major triad on scale-degree two of the Minor Lydian. In Example 5.25a, the raised version of scale-degree seven (i.e., Minor Lydian (2)) appears only at the end of each measure, each time in close proximity to the tonic F. In Example 5.25b, greater intermingling of the two forms is found. Further, the diatonic version of scale-degree four (here, B natural) occurs several times (always as B5).

Before discussing the seven-note chords constructed from the Minor Lydian scale, let us consider an example that demonstrates how chromaticism, occurring within a primarily diatonic environment, can act as an incentive for the use of the Minor Lydian in Zappa's music. Example 5.26a provides the succession of chords in the second half of the post-solo section of "Sinister Footwear II" (ECE/ACE 1977/1984b). As numbered on the example, eight chords occur therein (each lasting four measures), most of which are five-note chords. The bass line throughout this progression descends chromatically, reaching its goal at chord #7 on the bass pitch D, while the final chord (#8) breaks the pattern. Above the pedal notes of the progression, three different five-note chordal densities are in use, D[4-2-5-4], D[7-1-7-7], and D[3-2-5-4], while the six-note D[7-7-1-7-7] occurs in relation to the pedal of chord #7. For the most part, these densities will allow a second voice to track the descending bass by compound minor third, as shown by arrows on the example. The only chord complicating this structure is D[4-2-5-4], which begins with a compound *major* third. This chord is interpreted as a *chromatic displacement* of D[3-2-5-4]—an interpretation that will be confirmed in the scalar choices provided D[4-2-5-4]. This displacement can be clearly seen in the voice-leading that connects chord #5 and chord #6, whereby the upper structure of D[3-2-5-4] is retained in the following D[4-2-5-4], while the bass is displaced downward by a semitone.[42]

Example 5.26b provides an outline of the scales that Zappa employs melodically to accompany the chords shown above (the pedal for each chord is provided for reference). As can

[42] The semitonal displacement between D[3-2-5-2] and D[4-2-5-2] also explains the unexpected break in chromatic descent that occurs at chord #8. Now, this chord is shown to exact a similar chromatic displacement with chord #3, thereby breaking off one level of chromaticism while completing another. This long-range displacement is reinforced by a return to the octave register of chords #1–#4 at chord #8.

be observed, only chord D[4-2-5-4]—the chordal density resulting from chromatic displacement—is accompanied by the Minor Lydian scale (see chords #1, #6, and #8). Example 5.26c demonstrates, in reference to the chords #5 and #6, how one arrives at the Minor Lydian scale from this chromatic displacement. To understand this process, one must view the five- and six-note chords as segments of the seven-note chords of the Chord Bible. For D[3-2-5-4] (here shown as Chord #5), the obvious seven-note model is the Lydian chord D[E-5-3-2-5-4] or its closely related D[1-4-3-2-5-4]. Viewing D[3-2-5-4] as the upper segment of D[1-4-3-2-5-4] helps explain how one arrives at Minor Lydian (1) for Chord #6 through two chromatic alterations; the first chromatic displacement moves E to Eb (the pedals of the five-note chords), creating D[1-3-4-2-5-4]—an unconfirmed Minor Lydian (2) chord, which does appear in the piece "The Perfect Stranger"— then an addition chromatic displacement from B to Bb is necessary in order to arrive at the Minor Lydian (1) scale used for chord #6.[43]

Because the Minor Lydian scale is employed much more often than the diatonic scale in the works under investigation, many more seven-note chords can be confirmed as members of the Chord-Bible. Rather than attempting to list all of these, Example 5.27 provides the sixteen most-commonly used Minor Lydian chords, numbered 1 through 16 to aid the following discussion. Because Minor Lydian (1) and (2) are inversionally related, only one of these two scales can serve as the pitch collection for any given chordal density. In the example, all Minor Lydian (1) chords are spelled within the D Minor Lydian (1) scale while all Minor-Lydian (2) chords utilize the F Minor Lydian (2) collection. In order to demonstrate commonalities, chords

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[43] Of course, one complication to this reading is that Zappa does not actually use the C-Lydian collection for chord #5, but rather that of G Lydian, treating the pedal E as the Dorian pedal. This represents a slight inconsistency in the passage, as the remaining chords more clearly follow the above-described derivations from the seven-note diatonic chords. For example, the only six-note chord of the passage, D[7-7-1-7-7], clearly represents the lowest portion of the Dorian chord D[7-7-1-7-7-4], and is treated accordingly. Similarly, the five-note D[7-1-7-7] represents the middle portion of the same D[7-7-1-7-7-4], and, indeed, Zappa treats the pedals of these chords appropriately (i.e., the pedal functions as the Aeolian pedal).

are categorized in ascending order according to the size of the final interval of the density, beginning with chords containing a major second as the uppermost interval (i.e., in the manner described by Zappa).

By means of the analytical overlay, Example 5.27 indicates some principles of derivation for the Minor Lydian chords. Similar to the diatonic chords, the lowest pitch most often represents the tonic of its respective Minor Lydian scale (D for Minor Lydian (1) and F for Minor Lydian (2)). When this statement does not hold, the lowest pitch most often results from the octave displacement of a certain pitch: a phenomenon also employed among the diatonic chords. For example, chord #2 (D[1-2-1-3-1-2]) is created by transferring the bass F of chord #1 (D[E-3-1-3-12]) up an octave. A similar process describes the relationship between chords #3 and #4. Among other relationships, one will also observe that chords #3 and #4 are analogous to chords #1 and #2 within their respective Minor Lydian scales. That is, their densities present the same scale-degrees in the same ascending order; therefore, chords #1 and #3 and chords #2 and #4 have the same generic interval succession. Another interesting relationship is held between chords #15 and #16, which manifest the widest registral spacing of all Minor Lydian chords. As can be seen, chord #16, which does not feature the expected F of Minor Lydian (2) in the bass, precisely replicates the first two and last three pitches of Minor Lydian (1) chord #15. The remaining pitches, pcs 7, 8, and 9, invert about the axis D-G#: a manifestation of the inversional relationship between the two forms of the Minor Lydian discussed above. Finally, it should be noted that chords #9 and #14, both of which feature bass notes other than their respective tonics, remain unexplained in the example.[44] Perhaps their derivation could be understood through a

[44] There are several additional Minor-Lydian chords not provided in the example that similarly resist easy explanation. Perhaps Zappa envisioned "modes" of the Minor Lydian scale similar to those of the familiar diatonic modes. However, enough musical evidence does not exist to support this hypothesis.

full accounting of all Minor Lydian chords in the Chord Bible, yet because a complete catalogue is impossible without possession of the Chord Bible, any conclusions would be premature.

Before leaving the Minor Lydian scale in this section, let us observe a rare employment of the seven-note Minor Lydian chords in an *ECE* piece, and consider how these chords interact with a diatonic model. Example 5.28 provides the main theme of "Alien Orifice" (ECE 1981/1985), both in its initial statement (Example 5.28a) and in its reprise at the close of the piece (Example 5.28b). The original statement (Example 5.28a) is entirely diatonic. It consists of four four-measure phrases, each in a separate diatonic mode. Phrase 1 is in Eb Lydian, Phrase 2 in E Dorian, Phrase 3 in C Lydian, and Phrase 4 in G Dorian. On the score, Zappa merely indicates chord symbols for the accompaniment: major-seventh chords accompany the Lydian phrases while minor or minor-11th chords are used in the Dorian phrases. Now consider the reprise of the theme (Example 5.28b), which features the same phrase structure and the same melody (though varied). For the accompaniment of the reprise, Zappa provides both chord symbols (not given) and pitch-space realizations of these symbols. As can be seen, these realizations are all seven-note Chord-Bible harmonies. Of these, only the chord accompanying phrase 1, the diatonic D[5-3-2-5-4-7], is unconfirmed. Though the lowest note of this chord is G, Zappa's chord symbol (not given) indicates C as its true root.[45] Comparing this phrase with the corresponding phrase of statement 1, we see the employment of a familiar Dorian pedal substitution: specifically C Dorian for the formerly Lydian pedal Eb.

For the remaining phrases of the reprise, Minor Lydian chords are substituted for previously employed diatonic chords. (Accordingly, the diatonic melodies found in the initial thematic statement are altered to that of the appropriate Minor Lydian scale represented by the

[45] The bass does play G throughout this phrase. Therefore, the Aeolian pedal is used in place of the Dorian pedal.

given chord.) The concept of Dorian/Lydian pedal substitution also proves helpful in understanding these diatonic/Minor Lydian relations. For phrase 2, the chord D[8-1-6-1-2-5] is employed, which is derived from the G Minor Lydian (2) scale.[46] As discussed above, Minor Lydian (2) is closer in structure to the Lydian scale than to Dorian. When viewed as such, phrase 2 exhibits a two-pronged approach to Lydian/Dorian substitution: first, G Lydian is substituted for the E Dorian of statement one; then, this G-Lydian scale is altered by lowering its third scale-degree, resulting in the Minor Lydian (2) scale. For phrase 3, in which C Lydian was employed in the initial statement, the same basic process is at work, only here it must naturally work in reverse. Therefore, in the reprise, A Dorian is substituted for C Lydian; A Dorian is then altered by raising its fourth to D#, resulting in the A Minor Lydian (1) scale utilized for chord D[3-1-1-3-4-7]. In the final phrase of the reprise, the C Minor Lydian (2) chord D[1-3-4-7-4-3] is used. As the initial statement utilized a minor chord for this phrase, this chord continues the process of substituting Minor-Lydian (2) chords for previously employed Dorian chords. However, this substitution between G Dorian and C Minor Lydian (2) does not occur within the same Lydian system (i.e., it "should" occur between G Dorian and *Bb* Minor-Lydian (2)). Therefore, several chromatic alterations are necessary in the melody, including the introduction of the pitches Eb and F#. The extensive chromaticism utilized in phrase 4 creates greater drive towards the coda (not shown), which is comprised of a series of parallel D[8-1-6-1-2-5] chords, descending in pitch space by major thirds until the initial chord in the series is regained.

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[46] Curiously, the chord symbol in the score (not given) indicates A as the root of this chord. However, the bass plays the lowest note of the chord, Bb. Perhaps Zappa merely found this notation to be the least cumbersome.

3. Octatonic chords.

The final large category within the Chord Bible is comprised of chords based on the familiar octatonic scale (0134679T). As with the Minor Lydian scale, the octatonic scale is not found to any significant degree in Zappa's music prior to the time period under investigation.[47] In fact, it is quite possible that Zappa's interest in the octatonic scale may have come about as a result of the Chord Bible itself. That is, wishing to expand the cardinalities of his chords beyond seven, Zappa may have found the octatonic scale to be the logical choice of a scalar resource for eight-note chords, given his propensity to avoid repeating pcs with chords. Therefore, *all* eight-note chords found in the pieces under survey are octatonic chords. However, of the works surveyed, only the pieces "The Perfect Stranger" (ACE 1984a) and "Dupree's Paradise" (ACE 1984a) utilize the eight-note octatonic chords: pieces that were both composed relatively late in the period under question. Therefore, the octatonic chords may have been added to the Chord Bible some time after Zappa's initial experiments with seven-note chords were undertaken.

Example 5.29 provides sixteen octatonic chords, all of which are safely confirmed as members the Chord Bible.[48] Fortunately, given the high degree of consistency in treatment of the octatonic chords, no eight-note octatonic chords are unconfirmed. Due to the inherent symmetry of the octatonic scale, it is difficult to determine whether any given chordal density should be associated with any particular version of the octatonic scale. Therefore, all chords of Example 5.29 are represented with the same octatonic collection: $OCT_{0,1}$. (Chords are spelled with either pc 0 or pc 1 as their lowest pitch.) As opposed to the diatonic and Minor-Lydian chords, which are characterized by a euphonious sound, most octatonic chords are superficially

[47] When the octatonic scale does appear prior to this time period, it is often used as a connective device. See, for example, m. 38 of "Revised Music for Guitar and Low-Budget Orchestra" or m. 97 of "Drowning Witch."

[48] As in Example 5.27, these are listed according to the size of their uppermost interval.

"dissonant" in effect, with octave-spans of the chordal densities rarely extending up to or past two octaves. Perhaps to lessen the clustering of notes, Zappa occasionally states the lowest pitch of the octatonic chords an octave lower in musical passages. However, only chord #14, D[16-2-1-2-1-5-T], features this octave displacement consistently. Without access to the spellings used by Zappa in the actual Chord Bible, it is difficult to detect any clear method for generating the various octatonic chords from a given collection. Though space will not be devoted to a detailed explanation, the reader will notice strong similarities between certain chords, such as chords #4 and #7 and among chords #5, #9, #10, and #13. As for the chordal densities, all intervals sizes from 1–11 (in semitones) are featured at least once as the top interval of an octatonic chord.[49] Another interesting property manifested by certain octatonic chords is mirror symmetry, whereby the sequence of intervals reads the same from bottom to top as from top to bottom.[50] This type of symmetry is found in chords #1 (D[1-5-1-2-1-5-1]), #4 (D[2-4-2-1-2-4-2]), and #5 (D[3-2-1-2-1-2-3]).

In addition to the eight-note chords, there are also numerous seven-note octatonic chords (i.e., seven-note subsets of the octatonic scale) found in the pieces under investigation here. However, unlike the eight-note chords, very few of these seven-note octatonic chords can be confirmed as members of the Chord Bible, given their inconsistent usage. The densities of those found are primarily structured as pitch space segments of the eight-note chords. Rather than exhaustively account for all the seven-note chords found, let us consider a short musical segment in which several seven-note octatonic chords occur. Example 5.30 presents the chord succession

[49] When spelled within the same collection (as done in Example 5.29), each of the eight pitches of the given octatonic collection is set at least once as the top pitch of the chord. Of course, we cannot be certain that Zappa spelled the chords in this manner.

[50] Bernard observes this feature as a common occurrence in Varèse's music. See Jonathan W. Bernard, *The Music of Edgard Varèse,* 45.

comprising the final quintuplet of m. 37 of the “The Perfect Stranger.” Here, four different seven-note densities are presented. All of these are closely related to the eight-note chords, as all of these densities can be created by withholding the second-lowest pitch of certain eight-note chords. For example, D[6-2-3-4-2-4] is derived from D[2-4-2-3-4-2-4]. Likewise, D[6-1-2-1-5-T], D[3-3-2-1-2-6], and D[3-2-1-2-1-5] are derived from eight-note octatonic chords #14, #9, and #8, respectively.

If Example 5.30 were an isolated example, one might conclude that the passage in question is the result of a copying mistake. However, most of the found seven-note chords can be easily explained as derivations of the eight-note chords. For example, D[1-3-2-1-2-1], which is the most-commonly found seven-note octatonic chord in these works, constitutes the lower portion of eight-note chord #8, D[1-3-2-1-2-1-5]. That said, it cannot be stated for certain that the seven-note chords were created *from* the eight-note chords. Because the eight-note chords are all confirmed, it is easier presently to conceptualize the seven-note chords as such. However, the lack of eight-note chords in the works composed earlier in this period suggests that the eight-note octatonic chords may have come into being at a later date. Like many of the questions posed to the analyst of this repertoire, an answer will have to wait until the Chord Bible is made available. For the analytical purposes of the following section of this chapter, it is not necessary to answer all of these questions definitively.

In this section, I have demonstrated that the chords of the Chord Bible are generated from three different scalar resources: diatonic, Minor Lydian, and octatonic. The construction of the chords themselves has thereby been motivated by both pitch space (the chordal density) and pc (scalar) considerations. As explained at the outset, these factors can be seen in part as revelatory of Zappa’s understanding of Varèse’s harmonic constructions, which similarly have both important pc and pitch-space properties. Viewed in isolation, Zappa's chordal thinking seems much more oriented towards pc matters, given its strong reliance on referential scales. However, as we will see in the following section, these two conceptions of pitch (i.e., pitch space and pitch class) are in constant dialogue in Zappa's employment of Chord-Bible harmony in his orchestral works.

C. Chord-Bible harmony in Zappa's orchestral works.

In this section, I will investigate how Zappa utilized the chords of the Chord Bible in the series of large orchestral works that he composed circa 1977–82. Our interest here will be less on the chords themselves than on their contextual employment. That is, I will consider how Chord-Bible harmony is integrated or coordinated with other elements of the musical texture. As promised earlier in this chapter, this will allow us to witness both the chromatic and the scalar aspects of Zappa's music working in tandem. Four works will be discussed, two of which were likely composed early in the period and two of which were written towards the later part of the period. In the former category are the pieces "Envelopes" (ECE/ACE 1977/1982/1983c for the orchestral version) and "Sinister Footwear I" (ACE 1984/unreleased). (Because "Sinister Footwear I" is still not officially available to the listener, my comments will focus mostly on "Envelopes.") Of the later pieces, I will discuss "The Perfect Stranger" and the orchestral "Dupree's Paradise" (both ACE 1983/1984a). As one might imagine, the earlier works manifest a "simpler" technique than the later pieces in regards to the Chord Bible. Therefore, my discussion of the earlier pieces will act as a primer for the understanding of the more sophisticated employment of Chord-Bible harmony in the later pieces.

1. "Envelopes" and "Sinister Footwear I."

"Envelopes" presents an interesting test case for our study, as it was originally performed in ECE scoring. This original version was premiered in concert in 1977, towards the beginning of the time period in question.[51] Formally and melodically, the ECE and ACE versions are essentially identical. The primary difference between them is that the ACE version incorporates Chord-Bible harmony—particularly in the first half of the piece—while the original ECE version does not appear to utilize any of the aforementioned chords.[52]

On the whole, the utilization of Chord-Bible harmony in this piece is relatively simple, yet it nevertheless points to some of the more sophisticated applications in subsequent pieces. In the following quote, Zappa outlines the most common application of Chord-Bible chords that one finds "Envelopes":

> Suppose . . . you want to build a section in a composition that has a certain number of mathematical fixed points . . . . For instance, you say, "This section will contain [only] chords that are made of five notes; each chord must contain these intervals: a third, a half step, a fourth, and a major seventh." Then you set about randomly constructing. First you write a line; then you harmonize the line with five-note chords that adhere to that formula. Then you work it out with voice leading. . . . You get done doing that, you come back to the piano, and you start playing the chords, and you modify it to suit your ear.[53]

By this method, Chord-Bible harmony is relegated to the vertical dimension of the music. That is, the compositional process begins with the composition of a melody; then, in the subsequent stage, chords are applied to this pre-composed melody.

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[51] The ECE version was later a concert staple of the 1981and 1982 tours. This version can be heard on the album *Ship Arriving Too Late to Save a Drowning Witch* 1982. Also, it should be noted that short snippets of "Envelopes" are heard as early as 1970, in a concert conducted by Zubin Mehta that featured some of Zappa's orchestral works. These segments are all from the second section of "Envelopes." According to Tommy Mars, the main theme was composed in 1977. See Evil Prince, "Mars Needs Evil Princes," *T'Mershi Duween* 61, October 1997.

[52] No score exists for the ECE version. However, my transcription of this version indicates that no Chord-Bible harmony in used.

[53]Dan Forte, "Interview with Frank Zappa," *Musician* 19, August 1979.

A very simple musical realization of the above-cited approach is shown in Example 5.31—a short transitional passage, scored for low brass, immediately preceding Part 2 of "Envelopes."[54] Here, the melodic line, played by the trumpet, descends stepwise through the chromatic scale in m. 54, then ascends similarly in m. 55. Each pitch of this chromatic melody is harmonized by a chord. As is typical of this method, the melody is treated throughout as the uppermost pitch of the chord being employed, while the other instruments in the passage each take one voice of the chord's remaining six. Here, each instrument maintains the same voice throughout (except for the lowest-voice tuba, which is replaced by trombones in m. 55). Therefore, each *chord voice* is assigned to a specific *instrumental voice*. As the example shows, the chords in use are D[2-1-2-2-1-3] in m. 54 and D[3-3-1-2-1-4] in m. 55: both chords of the Minor Lydian (1) scale.[55] Because each measure maintains the same chord, the voice leading is parallel, with all seven voices moving by semitone intervals throughout each measure. (Due to the change in harmony from m. 54 to m. 55, only two voices—the trumpet 1 melody and horn 3—are entirely semitonal throughout the passage.) In sum, Example 5.31 is characterized by chromaticism in the horizontal dimension and the Minor Lydian scale in the vertical.

A fundamental aspect of Example 5.31 is its homorhythmic texture, which results automatically from the harmonization of each individual pitch of a pre-composed melody. In our next example, we find this tendency taken in a more idiosyncratic—but, for Zappa, typical—direction. Before looking in depth at this harmonization, let us begin with a general description of the pre-composed melody in question, the sixteen-measure main theme of "Envelopes" (see Example 5.32). The pitch collection of the theme is clearly not based on any single scale.

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[54] For ease of comprehension, Example 5.31 is not presented in traditional score ordering.

[55] D[2-1-2-2-1-3], though not listed in the earlier example, is a confirmed Minor Lydian chord.

Particularly, the three scalar resources of the Chord Bible—diatonic, Minor Lydian, and octatonic—are not in evidence. One might label the theme "chromatic," but not with the precise meaning attached to the label earlier in this chapter. That is, while all twelve pcs are available, they are not employed in service of chromatic saturation (besides the first four notes of the melody, which produce a chromatic tetrachord). Though metrically arranged into square four-measure segments, the melody itself is loosely organized. The analytical annotations on Example 5.32 indicate several transpositionally related segments in the melody, usually produced by sequential melodic activity. Otherwise, the melody has an improvisatory quality, produced in part by the employment of grace-notes figures—either literal grace notes as in mm. 8–9 or the many written-out thirty-second-note figures such as in mm. 10–11.[56]

Example 5.33 provides Zappa's harmonization of the main theme to "Envelopes," which we can use to better understand the coordination of melodic and harmonic events, as well as voice-leading matters, at this stage in the employment of the Chord Bible. (Here, all notes are represented as equal rhythmic values; refer back to Example 5.32 for the original rhythmic setting.) On the example, the seven chord voices are numbered from 1–7, with #1 representing the lowest pitch and #7 representing the highest (hereafter chord voices will be set in bold typeface on the examples); the density for each chord is also given below each stave. Several general features of the earlier example hold for this passage: (1) every pitch of the melody is harmonized by a seven-note chord—even the grace notes mentioned above; (2) the original melody is always set as the uppermost pitch in the chord; and (3) generally, an instrumental voice will maintain the same chord voice throughout.[57] In this example, the flute carries voice

[56] Arved Ashby suggests that these figures may serve as imitations of bends and slurs idiomatic to the guitar. Arved Ashby, "Frank Zappa and the Anti-Fetishist Orchestra," *The Musical Quarterly* 83/4 (1999): 557–605.

#7, the four horns are each assigned one of voices #6–#3, while the bassoons take the lowest two voices.

An important distinguishing feature of Example 5.33 is its lack of parallel voice leading. While in Example 5.31 the same chord was maintained throughout an entire measure, here no two adjacent pitches of the melody are harmonized with the same chord. As one typical result of this procedure, each of the remaining six voices in the texture will have a melodic contour distinct from that of the melody. When the melody ascends or descends by a large interval, such as the ascending major ninth between F4 and G5 in m. 7, the other pitches usually follow suit with the same contour.[58] More often, however, at least one voice will move in contrary (or oblique) motion to the melody in a given chord succession. In this example, the contours of the voices become progressively more distinct from the melody as one proceeds downwards from the melody. That is, the contour of voice #1 is the most dissimilar to that of the melody, while the contour of voice #6 is the most similar. For example, comparing the CAS of the six voices individually to the CAS of the melody, one finds that voice #1 differs with the melody 35 times; voice #2, 32 times; voice #3, 30 times; voice #4, 25 times; voice #5, 23 times; and voice #6, only 10 times. There are inherent properties in the spacing of pitches of the chordal densities that makes this result likely (i.e., because the lowest chord voice is the most removed in pitch space from the melody, its contour should naturally diverge the most from that of the melody). However, because a melody's contour and intervals will differ for every passage, as will the harmonization, this result cannot be predicted. In sum, the method outlined above ensures pitch and contour independence between the voices, while maintaining rhythmic uniformity.

[57] In the actual score, there are a few instances where an instrument will briefly (usually one note) take another voice. As there is no clear impetus for these "voice-crossings," it is likely that they are copying errors.

[58] However, this feature will not always hold. For example, the voice-leading occurring between the minor seventh Ab4 and Gb5 of the melody in m. 8 includes one descending contour in voice #1.

What, however, is the logic behind the particular harmonization chosen by Zappa? One possible consideration appears to be scalar derivation. This is most apparent by comparing the harmonization shown in Example 5.33 with that provided for the second, varied statement of the theme, the melody of which is given in Example 5.34. In the first thematic statement (Example 5.33), the majority of chords are diatonic. Of the 63 melodic pitches of the theme, 42 are harmonized by diatonic chords, with densities D[1-4-3-2-5-4], D[7-7-1-7-7-4], D[4-7-7-1-7-7], and D[E-5-2-1-2-5] utilized the most. Given this fact, an interesting dichotomy exists between the horizontal chromaticism of the melody and vertical diatonicism of the chords. In the second statement of the theme (Example 5.44), Minor Lydian chords predominate, as 51 of 66 melodic pitches are harmonized by the Minor Lydian chords of the Chord Bible. Therefore, the harmonization of the second statement can be heard as a Minor Lydian variation on the primarily diatonic model of the first statement. However, this reading is weakened somewhat by those pitches that are not harmonized in conformance to the predominating scalar resource for a given thematic statement. These exceptions are indicated by asterisks on Examples 5.33 and 5.34.[59] These non-conforming chords certainly make it more difficult to assert scalar resource as the only harmonic consideration at play, but it is not likely that the overwhelming predominance of these scales is accidental.[60]

The logic behind the successions of chordal densities in both harmonizations is more challenging to determine. For the most part, density successions appear largely arbitrary, with

[59] In statement one, exceptions include the Minor Lydian chord D[3-4-3-4-4-3], the seven-note octatonic chord D[2-1-2-1-2-1], and especially the chord D[2-1-2-2-2-2], which appears six times in the last eight measures (even concluding the passage).The last-named chord is a rarity, as it is not diatonic, octatonic, or Minor Lydian; instead, it can be thought of as an ascending “melodic minor” scale. In the pieces under investigation here, D[2-1-2-2-2-2] is only found in the earlier-composed pieces. I have not identified any other significant melodic-minor chords in this repertoire.

[60] Considering the harmonization of statement one, for example, it must be recalled that relatively few diatonic chords are members of the Chord Bible, so their high predominance in the harmonization must have been intentional.

no clear patterns emerging. Of course, any number of considerations may have played a part in the chords Zappa chose, but without sketches available for study—or the actual Chord Bible itself—the analyst has little chance of uncovering these. Considering the first thematic statement, three exceptions to the overall lack of patterning are labeled on Example 5.33. Here, we find a few brief chord successions replicated at different pitch levels. For example, the chord succession D[7-7-1-7-7-4] to D[4-7-7-1-7-7] at m. 10 is restated at T9 at m. 11. Similarly, see mm. 12–13 and m. 15 and 17. All of these pattern replications occur in support of melodic sequences that were identified earlier in Example 5.33. Therefore, their harmonizations act to draw attention to the more tightly constructed segments of the melody. Conversely, the more loosely organized elements of the melody receive a more random harmonization.

In statement two (Example 5.34), fewer of the aforementioned transpositionally related segments are found in the harmonization. This lack occurs as a result of the variation technique employed in statement two, whereby certain segments of the original theme appear at various transpositional levels, as indicated on the example (observe that transpositions are figured in relation to the original statement). The most significant result of this variation process is that some of the previously discussed sequential activity is altered, causing further repercussions in the harmonization. For example, the transpositional pathway from m. 28 to m. 29—T4 to T5 in relation to statement one (compare with Example 5.32)—prevents the pitch F# of m. 28 from partaking in the sequence, whereas its counterpart from statement one (D of m. 12) did. Accordingly, Zappa only harmonizes m. 28 sequentially, alternating between diatonic chords D[E-5-2-1-2-5] and D[E-5-3-2-5-4].[61] More extensively, the melody of m. 31, which "should"

[61] These diatonic chords may perhaps serve as a reference to the previous statement.

be sequentially related to m. 33, is altered to such a degree that the intervallic sequence is broken. As a result, these two measures are provided different harmonizations altogether.

Although the homorhythmic approach just discussed is the most prevalent technique in "Envelopes," other, more sophisticated methods are also found. A significantly different approach to voice-leading—one more commonly found in the later works—is shown in Example 5.35a, a short two-measure link that immediately precedes the main theme of "Envelopes."[62] The melody for this passage is a complete descending chromatic scale from Gb5 to G4, set in even sixteenth-note rhythmic values. However, of the remaining instrumental voices, only the first bassoon is similarly set to even sixteenth notes throughout. Here, therefore, we find the closest example yet encountered of a contrapuntal texture in Zappa's music. However, as the harmonic reduction of Example 5.35b shows, each pitch of the melody—as in previous examples—is harmonized by a seven-note chord of the Chord Bible. The rhythmic variety of the passage is achieved simply by sustaining any common tones that occur in the same voice between adjacent chords.[63]

Several factors were likely considerations in the harmonization of Example 5.35. First, the chromatic melody in even sixteenth notes creates a structurally important T6 relation between the melodies of m. 5 and m. 6. This T6 relation is reflected first in the harmonization of the opening melodic pitches of both m. 5 and m. 6 with the same chord, the Minor Lydian D[9-5-3-3-3-5]. A further manifestation of T6 is found in the oboe (voice #6), which in both measures sustains a certain pitch for the duration of five sixteenth notes;[64] these sustained pitches, Db and

[62] This link does not exist in the ECE version of "Envelopes."

[63] Such common-tone retention was also found in the harmonization of the second statement of the main theme. However, very few of such common tones were available for such treatment. In the harmonization of statement one, however, any such common tones were rhythmically articulated.

G, are likewise T6 related. Therefore, the interval succession created between voices #6 and #7 is 5-4-3-2-1 for the first five sixteenth notes of each measure. Following this point, the possible chord successions within a measure are limited to those having the aforementioned uppermost intervals. Within these constraints, chord choice was likely then determined with common tones in mind, producing the contrapuntal texture noted above. Therefore, in Example 5.35, the scalar resource for each chord is less central to the compositional process than its density, and voice leading is more strictly controlled than in prior examples.

Our final example from "Envelopes," taken from the coda, also points towards a technique found more frequently in the later-composed works, namely "voice crossing." Example 5.36a provides the passage in question, indicating also the orchestration employed.[65] As can be seen, the coda is divided into two-measure segments, demarcated by the change in orchestration at m. 90. Both segments utilize only four-note chords, all of which are confirmed members of the Chord Bible. Example 5.36b indicates the four-note densities employed and numbers their voices from 1–4. In segment 1 (mm. 88–89), the orchestration follows the conventions established above, whereby each instrument, or group of instruments, maintains the same chord voice throughout. In segment 2 (mm. 90–91), on the other hand, only voice #4 (the melody) remains in the same instrumental group. The remaining instruments "voice cross" at various points (see voice indications [bold numerals] on Example 5.36a).

The impetus for all of the aforementioned crossings is parallel voice leading. Returning to segment one, we find that the all densities employed—D[4-4-3], D[3-8-3], D[E-4-3], and D[4-1-3]— have a minor third as their uppermost interval. Therefore, the instrumental group

[64] Because the uppermost interval of D[9-5-3-3-3-5] is five, voice #6 must descend on the last sixteenth note of the measure in order to avoid a repeated note between voices #6 and #7.

[65] This music also serves as an isomelic variation of m. 79 of the piece, transposed by T3.

provided voice #3 (here, oboes and guitar) will always track the melody by a minor third below. Accordingly, no voice crossing is necessary to achieve this parallelism. In segment two, the parallel tracking occurs at the major seventh below the melody. However, given the densities employed in this segment, most often this major seventh is found in a non-adjacent voice. On Example 5.36b those pitches that produce a major seventh with the melody are circled. As can be seen, these notes are always given to horns 3 and 4, shown on the third staff of Example 5.36a. Therefore, these instruments will track the melody at a major seventh throughout the entirety of segment two. All remaining voice crossings indicated are merely by-products of "voice exchanges" with horns 3 and 4.

For the most part, the piece "Sinister Footwear I" offers little new to our understanding of Chord-Bible harmony in the earlier-composed works. Here, the homorhythmic approach, discussed in relation to the "Envelopes" main theme, is most in evidence. However, one characteristic distinguishing "Sinister Footwear I" from "Envelopes" is the presence of the hybrid style of composition, which was lacking in "Envelopes." These hybrid passages offer important evidence regarding the state of harmonic/melodic interaction at the early stages of Zappa's employment of Chord-Bible harmony.

Example 5.37 provides reductions of two hybrid-style passages from the piece, one occurring at rehearsal D (Example 5.37a) and the other from rehearsal F (Example 5.37b). These two excerpts are isomelic variations of one another. In both harmonizations, chords move at a much slower rate than the melody, and thereby take on a more traditional accompanying role. Yet, as was true for "Envelopes," the accompanying harmonies in these excerpts were likely applied after the composition of the melody. One fact that bears out this point is the presence of several non-chord tones in the melody (the pitches are circled on the examples). More importantly, the harmonizations of both excerpts are completely different: Example 5.37a utilizes only Minor Lydian chords, while Example 5.37b features mostly seven-note octatonic chords.[66] Comparing the two harmonizations, the octatonic chords of Example 5.37b are more successful in encompassing the pcs of the melody, as only two non-chord tones are present therein. A more essential difference is observed by comparing how the first melodic note that sounds against each chord relates to the given chordal density. In Example 5.37a, the aforementioned pitch is usually identical to the top note of the chord—a method consistent with the practices observed in "Envelopes." In Example 5.37b, this pitch is always the same pc as the *lowest* note of the chord. Importantly, the presence of these two distinct harmonizations suggests that, in the earlier-composed works, a high degree of pitch stratification still exists between melody and chord, and further that, similar to the harmonization of "Be-Bop Tango" discussed above, chords function largely to provide a harmonic color against which the melody is set.

In conclusion, my analyses of "Envelopes" and "Sinister Footwear I" have demonstrated that the application of Chord-Bible harmony is relatively simple in the earlier-composed works. In general, chords have been subservient to melody, applied to pre-composed chromatic melodies. The primary harmonization method we have witnessed is the homorhythmic setting, whereby each individual pitch of a melody is harmonized by a chord. Though these harmonizations have appeared largely arbitrary, we have also seen a degree of logic applied, sometimes in terms of scalar derivation, other times in terms of voice leading. Finally, more sophisticated utilizations of Chord-Bible harmony—including contrapuntal settings created through common-tone retention and voice-crossing techniques—have been encountered.

[66] Oddly, none of the chords of Example 5.37 are confirmed densities, though they do all conform to the chord-construction principle of not repeated pcs. One wonders perhaps if this music was composed prior to Zappa's cataloguing of chords.

2. “The Perfect Stranger” and “Dupree’s Paradise”

As pieces composed later in the period under investigation, “The Perfect Stranger” and “Dupree’s Paradise” are distinguished in several ways from the previously discussed pieces relative to Chord-Bible harmony. First, fewer unconfirmed chordal densities are found, suggesting that Zappa had excised some of the chords found in the earlier pieces to arrive at a more definitive catalogue of preferred chords. Therefore, all chords found in these pieces conform to either diatonic, Minor Lydian or octatonic pitch collections. Second, as already established, these two pieces heavily feature eight-note octatonic chords, making them the most thoroughly octatonic music we have encountered in this study. Finally, while nearly all of the voice-leading techniques employed in “Envelopes” and “Sinister Footwear I” are present—including homorhythmic harmonizations and contrapuntal settings created by retaining common tones in the same voice—the dichotomy between melody and chord is not as strongly drawn in these pieces. Instead, as will be demonstrated, the chords of the Chord Bible are more essential to the compositional process.

Though Zappa offered a program for “The Perfect Stranger”—a surrealist scenario involving a housewife, a door-to-door salesman, and a vacuum cleaner—the analyst is given little evidence in the score with which to tie the events of the music to the aforementioned program.[67] Two lopsided movements are indicated (hereafter “The Perfect Stranger I” and “The Perfect Stranger II”), but the listener will undoubtedly hear the work as a single, uninterrupted movement. Attempting to describe the form of the movement under any conventional terms is certainly fruitless. However, a certain degree of formal articulation is achieved by several appearances of a “main theme” throughout the movement. The treatment of this theme, which is

[67] Many of Zappa’s orchestral pieces have programs of some kind (most were performed as ballets). However, it is uncertain if the music is truly intended to depict these scenarios or if they were merely applied after the composition was completed.

stated twice in both movements, indicates some ways in which Zappa's application of Chord-Bible harmony had evolved since "Envelopes" and "Sinister Footwear I." As will be demonstrated, this advancement involves a tighter integration of the scalar resources of the chords with melodic material.

Example 5.38a provides the first statement of the theme, which occurs immediately following the short introduction to "The Perfect Stranger." As shown, the twelve-note pitch succession of the theme resides entirely within the $OCT_{1,2}$ collection. Of these twelve numbered pitches, those #1–#3 and #11–#12 are each harmonized by Chord-Bible densities. The harmonization of pitches #1–#3 is of the homorhythmic type, whereas that of pitches #11–#12 allows for common-tone retention in the same voice, if applicable (see violin 3, viola 1, and cello 1). On the whole, the octatonicism of the melody is not reflected in the harmonization. In particularly, observe the use of Minor Lydian chords for pitches #1–#3. At the end of the phrase, however, the octatonic scale is employed for two of the three chords that harmonize pitches #11–#12. The last of these, the eight-note D[9-2-7-2-6-1-2], is particularly significant, as it closes the phrase with the same $OCT_{1,2}$ scale that the melody unfolds.

Now consider Example 5.38b, the second statement of the theme in "The Perfect Stranger I." Here, the melody appears in isomelic variation, with the first three pitches transposed by T2. As a result of this transposition, the entire melodic succession of statement two is no longer contained in $OCT_{1,2}$, though only pc 9 does not belong. More importantly, the harmonization of the theme in Example 5.38b is entirely comprised of eight-note octatonic chords, set (more or less) in homorhythm with the melody. Five of the nine accompanying chords are of the same $OCT_{1,2}$ as the melody (see asterisks). This feature may be only coincidental in some cases, given the presence of chords not of $OCT_{1,2}$ in the passage, as well as the already-small number of distinct octatonic collections in general. However, the final chord of the excerpt is certainly not coincidentally of $OCT_{1,2}$, as it marks a return to the same closing chord of Example 5.38a, D[9-2-7-2-6-1-2]. In sum, Example 5.38b manifests a closer relationship between melody and accompaniment, both through the consistent use of octatonic sonorities and through the emphasis on the $OCT_{1,2}$ collection in both vertical and horizontal dimensions.

In the two statements of the main theme in "Perfect Stranger II," the emerging octatonicism detailed in the two previous examples is brought to fruition through a more thorough saturation of musical space with the $OCT_{1,2}$ scale. Example 5.39 provides a reduction of the first of these statements. Once again, the melody is presented as an isomelic variation; here, however, it is also transposed by T9 from its original pitch level. Fortuitously, this T9 transposition allows for the retention of the $OCT_{1,2}$ collection so prominent in the melody's initial form. Following this statement of the theme, the melody embarks on a lengthy section in the hybrid style (mm. 16–78). To accompany the hybrid-type melody, Zappa adopts an approach familiar from the ECE works, whereby a single chord is sustained for a substantial period below the melody. As is indicated on Example 5.39, the chord accompanying the $OCT_{1,2}$ theme is D[9-2-7-2-6-1-2], the same density that ended both of the previous statements of the theme. Like the theme itself, this chord is transposed by T9 from its original pitch level, thereby retaining the $OCT_{1,2}$ collection. Additionally, following the theme statement, the melody continues to cull its pitches from the $OCT_{1,2}$ scale. In fact, the entire pc content of the melody of Example 5.39 is within $OCT_{1,2}$. The maintenance of this single octatonic scale is made possible by the T6 transposition of D[9-2-7-2-6-1-2] at m. 21: an additional transpositional level of this chord that allows for the retention of $OCT_{1,2}$.[68] Throughout the remainder of the hybrid section initiated at

[68] Both of these transpositions of D[9-2-7-2-6-1-2] are equidistant from the initial pitch level of the chord in Example 5.38. That is, both are transpositions by ic3 (T9 and T3).

m. 16, $OCT_{1,2}$ continues to be of priority. For example, from mm. 16–60, all octatonic chords that appear utilize the $OCT_{1,2}$ collection, as do the melodies that occur in tandem with these chords.[69]

One important aspect of Example 5.39 is that it demonstrates an integration of the pitch content of both melody and chord. That is, throughout this hybrid section, whatever pitch collection is found in the sounding *harmony*, it is the same and *only* collection employed *melodically*. This is quite different from what we witnessed in relation to the hybrid section of "Sinister Footwear I," wherein it was apparent that the melody was composed before Zappa contemplated its harmonic setting, resulting in various non-chord tones in the melody. Further evidence of this change in focus is seen in the fourth, and final, statement of the theme in "The Perfect Stranger," occurring at m. 199 of "The Perfect Stranger II." This final statement initiates a huge isomelic restatement of the previously discussed mm. 16–78, which plays out until the close of the piece.[70] Here, however, the theme is returned to its initial pitch level (beginning on F, as in Example 5.38a). Not surprisingly, it is accompanied by the same D[9-2-7-2-6-1-2] chord that closed both statements of the theme in "The Perfect Stranger I," reactivating the central $OCT_{1,2}$ scale. Further, the remaining accompanying densities are all identical to their counterparts from mm. 16–78, which will also result in pervasiveness of $OCT_{1,2}$ throughout most of the section.

The above examples lead us to the following general hypothesis regarding collectional interaction between horizontal and vertical aspects in these works: (1) when chords are

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[69] The vast majority of chords used in this hybrid section are octatonic. However, one also finds two Minor-Lydian chords and one (brief) diatonic chord (to be discussed below).

[70] The primary difference between these two hybrid sections is the deletion of various non-hybrid "insertions" found throughout mm. 16–78 in the final section. Also, the orchestration is altered dramatically and, of course, the rhythms are varied.

juxtaposed, the maintenance of a single pc collection from chord to chord is not a compositional consideration; and (2) when a chord and melody (or other element) are superimposed, they will typically share the same pc collection. We have already witnessed plenty of examples that bear out the first point (particularly in "Envelopes"). One further example of this principle is demonstrated in Example 5.40, a harmonic reduction of mm. 48–51 of "The Perfect Stranger I," which immediately follows the second statement of the theme.[71] Here, the homorhythmic-harmonization technique familiar from "Envelopes" is employed. Only two chordal densities are employed, the octatonic D[1-3-2-1-2-1-5] and D[1-5-1-3-5-6-7], and these two densities oscillate back and forth as the harmonization for the twelve pitches of a "freely" chromatic melody. (This type of sequential harmonization would more typically be employed for a sequential melody, but that is not the case here.) Of these twelve chords, seven utilize the $OCT_{1,2}$ collection. Because almost half of the chords are not of this collection, we can be certain that maintaining this particular octatonic scale was not one of the compositional priorities that went into the passage, as it would have been quite easy for Zappa to change a melodic pitch here and there to coordinate the pitch collection of both melody and accompaniment. Instead, it is the replicated density pattern that supplies consistency to the excerpt.

As for the second point relating to superimposed layers, the pc agreement between melody and accompaniment demonstrated in Example 5.39 can be seen as merely an extension of the practices familiar from Zappa's diatonic music; however, here the accompanying zones present the *entire* pc collection of the given scale. Besides hybrid textures, more novel practices of superimposition are found in "The Perfect Stranger," all of which confirm the hypothesis stated above. For example, consider the excerpt provided in Example 5.41. This passage occurs

[71] This segment is demarcated by its uniform rhythm, as each chord sounds for the duration of a quarter-note triplet.

at the beginning of “The Perfect Stranger II” as a self-contained interlude, and is soon followed by one of the thematic statements. In total, six separate eight-note octatonic densities are stated in the interlude, each by one of four instrumental groups: woodwinds, brass, celesta, or strings.[72] Though none of the densities are attacked simultaneously, most chords continued to sound well-past the attack of the following chord. Throughout most of the passage, in fact, at least two chords are sounding simultaneously. Because superimposition is employed here, all simultaneously sounding chords must be of the same octatonic scale. Further, because superimposition is at work throughout the entire passage, all six of these chords must maintain the same scale. Not surprisingly, this shared collection is $OCT_{1,2}$, which, as already detailed, plays a crucial role throughout the piece.

Another technique of superimposition employed by Zappa in “The Perfect Stranger” represents a merging of the two previously discussed methods. This method involves the melodic statement of chordal densities, whereby a melody’s pitch-space realization is identical to that of a Chord-Bible density. Two examples of this phenomenon are given in Example 5.42. The first of these, Example 5.42a, occurs at the outset of the piece. Following two Minor Lydian chords in mm. 5–6, the central eight-note octatonic D[9-2-7-2-6-1-2] arrives at m. 7 in the accompaniment. Above this chord, a clarinet melody is superimposed that unfolds the eight-note chord D[2-1-3-2-1-2-6]. Because this horizontalized chord is superimposed above the accompaniment, both layers must utilize the same octatonic scale (once again $OCT_{1,2}$). A similar description applies to Example 5.42b, an excerpt from the lengthy hybrid section of “The Perfect Stranger II.” Compared to the remainder of this section, chordal successions are fairly rapid here. Typically, a disparity in pc collection might occur in such situations. However, the

[72] The third density of the excerpt, D[3-2-1-8-6-1-14], requires the high C# of the preceding density D[1-2-1-2-1-3-E] to complete itself.

melody occurring in tandem with the chord successions unfolds the symmetrical eight-note D[2-4-2-1-2-4-2], which utilizes the $OCT_{1,2}$ scale. Therefore, the three different octatonic chords found the accompaniment are expected follow suit. Interestingly, Zappa inserts the E-Lydian chord D[E-5-T-4-1-2] within this process. This interpolation is made possible by the melodic repetition of the pitches E-B-A# from mm. 57–59: pitches that do suggest the E-Lydian mode. These repeated pitches serve a dual purpose: not only do they allow for the brief diatonic shift, but the emphasized semitone B-A# of the motive also defines the axis of symmetry for the octatonic density unfolded melodically.

While “The Perfect Stranger” demonstrates a greater integration of harmonic and melodic events, the innovations of “Dupree’s Paradise” are primarily in the realm of voice leading. Specifically, the technique of “voice-crossing,” which we have thus far seen only in relation to four-note chords, is the chief compositional concern of the piece.[73] The form of “Dupree’s Paradise” is A-B-A', with the A sections containing the main theme of the ECE version with which we are already familiar. The B section, which is original to the orchestral version, is essentially a concatenation of various experiments with Chord-Bible harmony, broken up by occasional recollections of the main theme. Most of these experiments feature the voice-crossing procedure we will now discuss in detail.

Example 5.43, one of the first instances of the voice-crossing technique in “Dupree’s Paradise,” will demonstrate the basic elements at work. This excerpt occurs at the end of the first statement of the theme in the A section. As indicated on Example 5.43a, the melody in use is a T4 transposition of the theme from the original ECE version. Example 5.43b provides a harmonic reduction of the same excerpt. As shown, only seven-note chords are employed here, all of which are confirmed Minor Lydian chords, with the exception of the seven-note octatonic

[73] This technique is also found in isolated spots of “The Perfect Stranger,” including Example 5.42b.

D[1-5-1-2-1-6] (based on the eight-note D[1-5-1-2-1-5-1]). Scanning the musical realization (Example 5.43a), observe the rhythmic independence existing among the instrumental voices. In prior examples (i.e., Example 5.35), such rhythmic independence was achieved by holding common tones that appeared in the same chord voice. However, the common-tone exploitation of this passage is much more extensive than this familiar method. Here, greater rhythmic independence is made possible through the use of "voice crossing," whereby an instrumental voice crosses from its "assigned" chord voice to that of another instrument.

Example 5.43b demonstrates the first step in the compositional process by which the texture of Example 5.43a is achieved. First, each chord succession is scanned for common tones, considering those both in the same chord voice or those between different voices (these common tones are indicated by arrows on the example). If a given chord succession contains only common tones in the same chord voice, then the voice assignments of the instruments in the initial chord may stand (e.g., see the voice leading between the first and second chord on Example 5.43a). If the common tones are in different chord voices, then the instrument first articulating the pitch in question will cross into the necessary chord voice to maintain that pitch.

On Example 5.43a, the chord-voice assignments (bold numerals) are indicated for certain segments, allowing the reader to track some of the notable voice crossings. The primary voice crossings of mm. 35–36 are those of oboe 1, oboe 2 and clarinet 1, which were employed to retain the common tones B, F, and Ab, respectively. The remaining crossings of clarinet 2 and bass clarinet are fallouts from these primary crossings, as these instruments must cross into another voice in order to complete the given chord (and because their chord voice has been usurped by a different instrumental voice). The most extensive voice crossing in Example 5.38a is found within mm. 38–39, wherein the initial melodic Ab of chord voice #7, given to the flutes, crosses into voices #5, #4, #6, and #3 in order to retain this common tone.

The voice crossings of mm. 38–39 are of interest, as they force the melody itself—the sustained Ab—to delve into the inner voices within the chord sequence. This is significant because it reveals that the melody in these two measures is not controlling the transpositions of the chords, as was true for all previous examples.[74] How, then, were the transpositions decided in these two measures? The answer is found in the high Eb that is held for the final five quarter-notes of this segment. As Eb takes over as voice #7 in this span (see Example 5.43b), the chord transpositions occur according to Eb rather than the melody's Ab. However, the chord densities that appear therein are limited to those that contain a pitch seven semitones below the highest pitch, thereby insuring that Ab will be present as a common tone throughout in one of the voices beneath voice #7.

With our knowledge of the basic steps involved in the voice-crossing technique, let us turn to the experiments with Chord-Bible harmony of the B section of "Dupree's Paradise." Though these are far too lengthy and numerous to detail in full, we will look closely at three short excerpts from this section, which will allow us to see some of the compositional possibilities afforded by the technique. These examples will also show a greater level of abstraction at work, whereby the chords of the Chord Bible begins to assert greater independence, no longer serving merely as harmonizations for pre-composed melodies.

Example 5.44 offers the first of these excerpts, mm. 107–110 of the B section. Similar to the previous examples, both the actual musical realization (Example 5.44a) and its harmonic reduction (Example 5.44b) are provided. To understand the procedures employed here, we must

[74] This statement can be made because we already know that Ab is the "true" melody of this passage, given its basis on a pre-existing tune.

first examine the structure of the accompaniment. As Example 5.44b shows, all densities are eight-note octatonic chords. Six chords are in use, and these chords are arranged into a progression of seven chords—with one density appearing twice—that is stated four times in succession. The first two statements and the final two statements of the chord progression are related at T0; therefore, from beat 4 of m. 108 onwards, the music is identical to what preceded it. The first two statements of the progression likewise manifest transpositional relationships. Comparing these two statements, the first four corresponding chords map at T7 while the last three are T0 related.

Complicating one's hearing of the aforementioned transpositional relations between the first two statements of the chord sequence is Zappa's employment of common-tone voice leading. As can be seen, nearly all common tones existing between adjacent chords—both those in the same chord voice and those between different voices (see arrows)—are exploited in the musical realization (Example 5.44a) by the now-familiar method of common-tone retention via voice crossing. Given the high number of common tones between different chord voices, several voice crossings are executed. Evidence of the shuffling of voices that occurs throughout the first two measures can be seen by comparing the voice assignments of the initial chord with the final chord of the first half of the excerpt. As can be seen, only the flutes and oboe 1 conclude with the same voice assignment with which they began, and, of these three, only the flutes maintain the same chord voices throughout the entire segment. Accordingly, the T7 and T0 transformations can only be perceived in entirety by focusing on the flute parts.

Following from the immediately preceding observation, we must assume that flute 2, which contains the highest voice (#8) throughout, represents the melody of the passage. Therefore, the transpositions for each chord are decided by this voice. Considering the high number of same-voice common tones that characterizes this voice, providing it a rhythmic distinction lacking in the other voices, this would seem a logical assumption. However, compared to earlier examples, this voice holds less aural primacy, as it is easily swamped by the other instruments in the texture.[75] Instead, it is the employment of the chords—their arrangement into progressions, their small- and large-scale transpositional relations, and their complex voice leading—that provides the most salient aspects of the music.

A more complete integration of Chord-Bible harmony in the musical texture is demonstrated in Example 5.45, which provides mm. 196–200 of the piece. Here, m. 196 and m. 200 sandwich three measures comprised of eight-note octatonic chords. In both m. 196 and m. 200 (see Example 5.45a), one finds the melodic unfolding of a seven-note chord (octatonic D[1-5-1-2-1-6] and Minor Lydian D[3-3-1-3-4-7], respectively). Both of these horizontalized chords are tracked below in parallel by at least one instrument. In m. 200, this parallel tracking is of the three-note chord D[E-7]. The instruments involved in this "melodic" gesture conclude by sustaining their pitches throughout the rest of the given measure, under (or over) which the remaining instruments create different seven-note chords in tandem with these sustained pitches. Example 5.45b provides the harmonic derivation for these two measures. As can be seen, in both m. 196 and m. 200, the sustained pitches are created largely via the retention of common tones between different chord voices. For example, the sustained C# in m. 196 voice-crosses from voice #6 to voice #4 to voice #5 throughout the chord progression employed. Because none of the sustained pitches are treated as voice #7 in these measures, the compositional process that generated the accompanying chord progression could have been achieved in several ways. In one scenario, Zappa may have composed a new melodic voice #7, and thereafter determined a

[75] In the similarly-scored Example 5.44, the melody had been given to both flutes, thereby thickening its volume.

succession of seven-note chords that would retain the desired sustained pitches in one of their voices. In another scenario, he may have first decided on a series of chords, and then found the appropriate transpositions that would maintain these common tones. By either scenario, this passage shows Chord-Bible harmony influencing all facets of the compositional process.

Our final example contains one of the most virtuosic utilizations of Chord-Bible harmony in "Dupree's Paradise," wherein the chords employed become the primary motivation of the musical realization. Example 5.46 provides mm. 131–135, the beginning of a segment that extends through m. 141. As in previous examples, this passage is given both as it is musically realized (Example 5.46a) and in the form of a harmonic reduction (Example 5.46b). Whereas previous examples have all exhibited a melody to varying degrees, this excerpt is not "melodic" in any traditional sense. Instead, the musical realization (Example 5.46a) features 23 orchestral parts arranged in a hocket-like texture. All simultaneously sounding pitches in the passage result in Chord-Bible harmonies; in m. 131, 134 and 135, a chord is formed on every sixteenth note while in mm. 132–133, a chord occurs on every quarter note. As the harmonic reduction shows (Example 5.46b), both seven- and eight-note chords intermingle herein. Most of the seven-note chords are Minor Lydian chords, yet both seven-note octatonic (D[1-5-1-4-1-6], D[1-3-2-1-2-1]) and diatonic chords (D[4-7-7-1-5-2]) are also found. The randomness of these chord successions appears to be a result of the focus on common-tone voice leading. As Example 5.46b demonstrates, each chord succession features at least one common tone. More often, several common tones of both familiar types are found. In the musical realization, all of the arrow pathways shown in Example 5.46b are exploited as in previous examples, as the reader may verify.[76]

[76] Zappa overlooks only one opportunity for common-tone retention, specifically the F#4 that occurs within the second and third chords of m. 135.

Because a 23-part orchestra is employed here rather than the typical seven- or eight- part section, the voice-crossing technique is necessarily of a different nature. While previous examples have shown instruments impinging on the chord voice originally assigned to (and conceptually belonging to) an *instrumental* voice, here no chord voice is assigned to a particular part. Instead, any instrument of Zappa's choosing may play a given common-tone span, and any of the remaining instruments may be employed to fill out the extra pitches of the chord density occurring in tandem with the common tone. Therefore, the terms "voice leading" and "voice crossing" only apply in relation to the more abstract chord-voice space shown in Example 5.46b. Besides the aforementioned desire to find chord successions that have a large number of common tones, it is difficult to ascertain any other principles that may have generated the densities, and transpositions of these densities, shown in Example 5.46b, particularly given the lack of a recognizable melody. As with many of the questions that have arisen in this section, answers could only likely come through the study of Zappa's sketches.

III. Summary remarks.

In this chapter, several aspects of Zappa's non-diatonic music have been summarized. In part I, we considered Zappa's early experiments with serialism and how they may have impacted his approach to pitch chromaticism. Three characteristics were described as possible fallouts: pc diversity, chromatic saturation, and inversional symmetry. Through these tendencies, Zappa managed to incorporate certain general characteristics of serial composition while maintaining complete control over pc succession. These chromatic techniques were shown to be most prevalent in Zappa's melodies. In part II, the concept of scale was reintroduced into the discussion. Described here as a response to the lack of consistent approach to harmony in the chromatic music, Zappa developed a system based on a "Chord Bible" in the period from 1977–82. These chords, which reveal some indebtedness to Varèse's chordal writing, were shown to be primarily vertical realizations of three scales: diatonic, Minor Lydian, and octatonic. Throughout analyses of four pieces, "Envelopes," "Sinister Footwear I," "The Perfect Stranger," and "Dupree's Paradise," an evolution in the employment of Chord-Bible harmony was demonstrated. In the earlier-composed titles, chords were used primarily to harmonize the individual pitches of chromatic melodies. Thereby, chromaticism characterized the horizontal dimension while scales were relegated to the vertical. In the later pieces, greater care was given to integrating the Chord Bible in the compositional process. In "The Perfect Stranger," an emphasis was found on chords and melodies within the $OCT_{1,2}$ scale, thereby achieving a greater coordination between melody and accompaniment. Finally, in "Dupree's Paradise," Chord-Bible harmony and common-tone voice leading between chords was shown to be a primary compositional concern. In sum, this chapter has demonstrated the various ways in which Zappa appropriated features from the music of his post-tonal influences while developing his own unique compositional methods.

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MUSICAL EXAMPLES

Musical passages quoted in this volume are used in accordance with the “fair use” clause of the U.S. copyright law (17 USC 107).

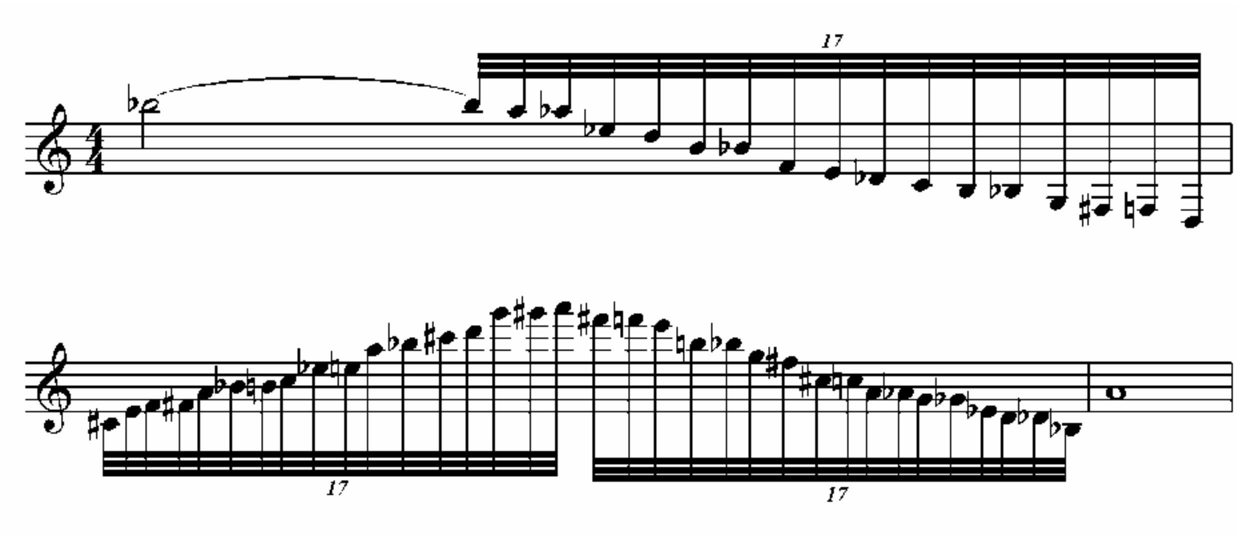
Figure 1.1. List of albums cited.

(1966)	*Freak Out!*
(1967)	*Absolutely Free*
(1968a)	*We're Only In It For The Money*
(1968b)	*Lumpy Gravy*
(1969a)	*Uncle Meat*
(1969b)	*Hot Rats*
(1970a)	*Burnt Weeny Sandwich*
(1970b)	*Weasels Ripped My Flesh*
(1970c)	*Chunga's Revenge*
(1971a)	*Fillmore East – June 1971*
(1971b)	*200 Motels*
(1972a)	*Just Another Band From L.A.*
(1972b)	*Waka/Jawaka*
(1972c)	*The Grand Wazoo*
(1973)	*Over-Nite Sensation*
(1974a)	*Apostrophe*
(1974b)	*Roxy & Elsewhere*
(1975a)	*One Size Fits All*
(1975b)	*Bongo Fury*
(1976)	*Zoot Allures*
(1978a)	*Zappa In New York*
(1978b)	*Studio Tan*
(1979a)	*Sleep Dirt*
(1979b)	*Sheik Yerbouti*
(1979c)	*Orchestral Favorites*
(1979d)	*Joe's Garage*
(1981a)	*Tinsel Town Rebellion*
(1981b)	*Shut Up 'N Play Yer Guitar* (three volumes)
(1981c)	*You Are What You Is*
(1982)	*Ship Arriving Too Late To Save A Drowning Witch*
(1983a)	*The Man From Utopia*
(1983b)	*Baby Snakes*
(1983c)	*London Symphony Orchestra*
(1984a)	*Boulez Conducts Zappa: The Perfect Stranger*
(1984b)	*Them Or Us*
(1984c)	*Thing-Fish*
(1985)	*Frank Zappa Meets The Mothers Of Prevention*
(1986a)	*Does Humor Belong In Music?*
(1986b)	*Jazz From Hell*
(1988a)	*Guitar*
(1988b)	*You Can't Do That On Stage Anymore, Vol. 1*
(1988c)	*You Can't Do That On Stage Anymore, Vol. 2*

Figure 1.1. (*continued*)

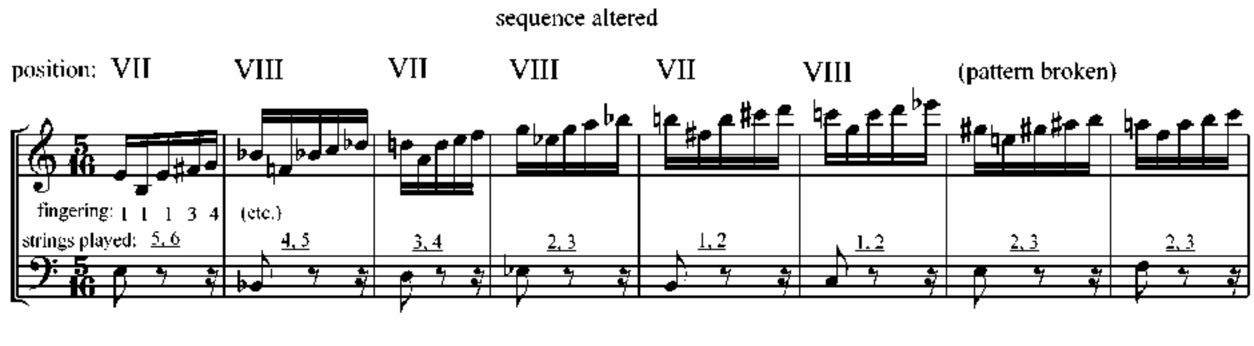
(1988d)	*Broadway The Hard Way*
(1989)	*You Can't Do That On Stage Anymore, Vol. 3*
(1991a)	*The Best Band You Never Heard In Your Life*
(1991b)	*Make A Jazz Noise Here*
(1991c)	*You Can't Do That On Stage Anymore, Vol. 4*
(1992a)	*You Can't Do That On Stage Anymore, Vol. 5*
(1992b)	*You Can't Do That On Stage Anymore, Vol. 6*
(1992c)	*Playground Psychotics*
(1993a)	*Ahead Of Their Time*
(1993b)	*The Yellow Shark*
(1994)	*Civilization Phase III*
(1996a)	*The Lost Episodes*
(1996b)	*Läther*
(1998)	*Mystery Disc*
(1999)	*Everything Is Healing Nicely*
(2002)	*FZ: OZ*
(2003)	*Halloween*
(2004a)	*Joe's Corsage*
(2004b)	*Quadiophiliac*
(2006a)	*Imaginary Diseases*
(2006b)	*Tance-Fusion*
(2007a)	*Buffalo*
(2007b)	*The Dub Room Special!*
(2007c)	*Wazoo*
(2008)	*One Shot Deal*
(2009)	*Lumpy Money*

Example 2.1. “Mo ‘N’ Herb’s Vacation I”: m. 64ff (*London Symphony Orchestra* 4:00–4:10).

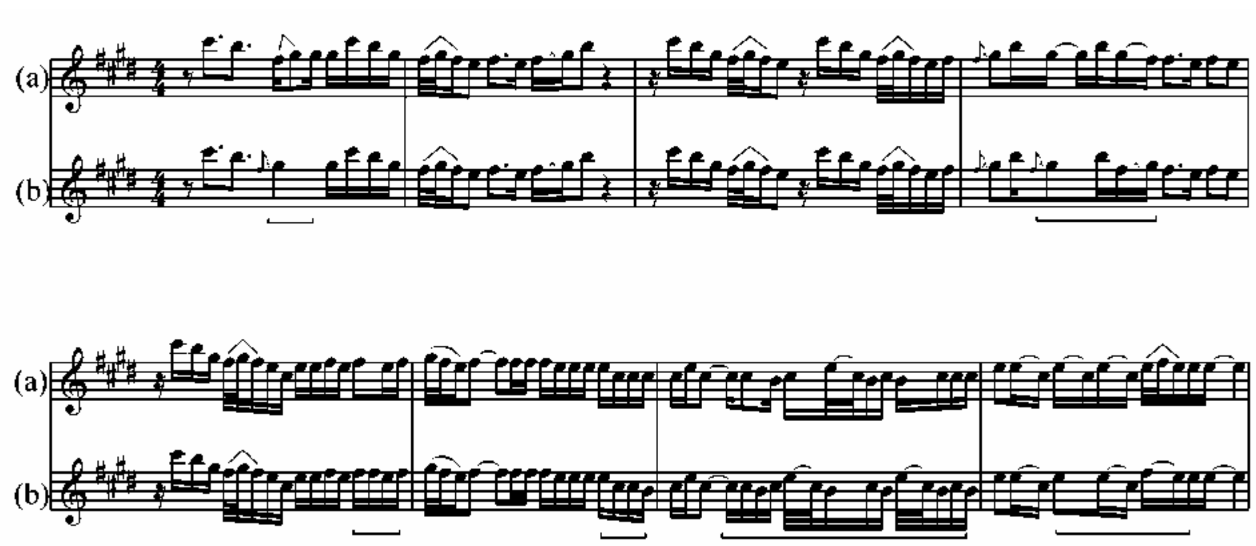


Example 2.2. “Rollo” (*Imaginary Diseases* 1:14–1:32).

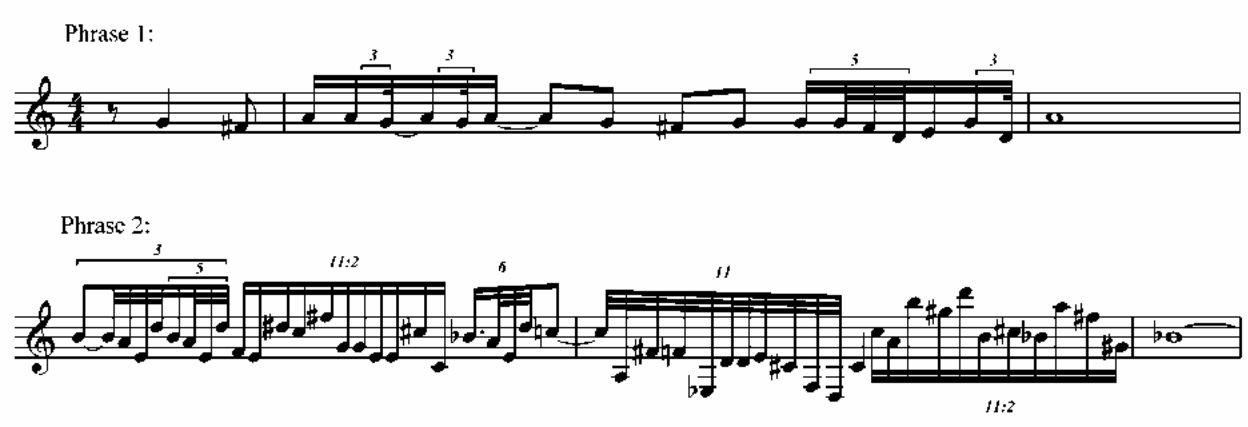
Example 2.3. “Echidna’s Arf (Of You)” (*Roxy & Elsewhere* 3:07–3:13).



Example 2.4. “Peaches en Regalia” solo (*Hot Rats* (a) 1:05–1:23, *Filmore East* (b)): discrepancies bracketed.



Example 2.5a. "Mo 'N' Herb's Vacation I": opening melodic phrases.



Example 2.5b. "Theme from the Third Movement of Sinister Footwear":
opening melodic phrases (trans. Vai).

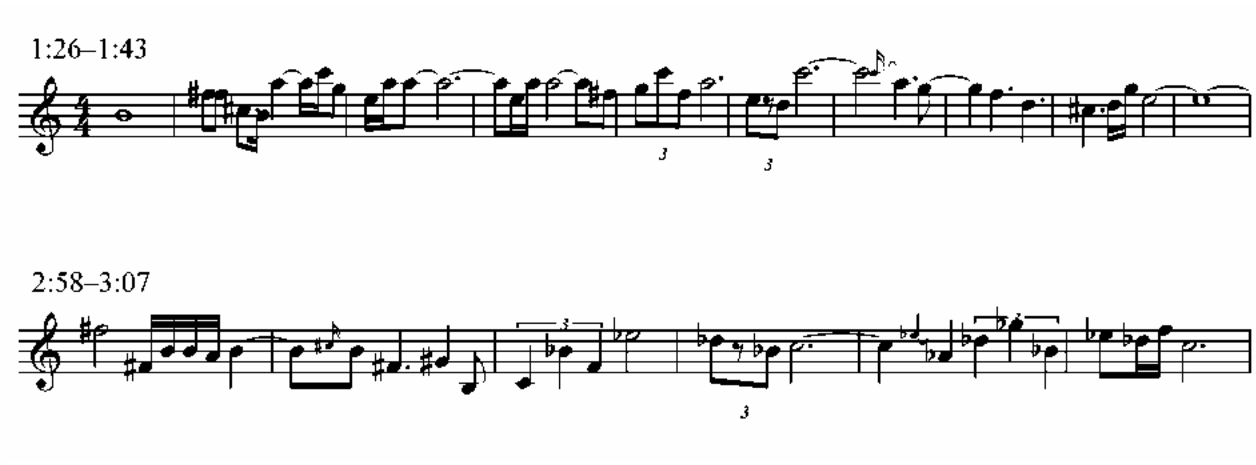
Example 2.6. “Alien Orifice”: m. 57ff
(*Frank Zappa Meets the Mothers of Prevention* 2:33–2:42):
CAS and CSEG contour analysis.

Example 2.7. “G-Spot Tornado” (*Jazz From Hell*):
A1 and A4 (0:36–0:47) statements, with pitch-substitution chart.

<u>A1</u>		<u>A4</u>
B	$\xrightarrow{T2}$	C#
A	$\xrightarrow{T4}$	C#
F#	$\xrightarrow{T2}$	G#
E	$\xrightarrow{T3}$	G
C#	$\xrightarrow{T2}$	D#

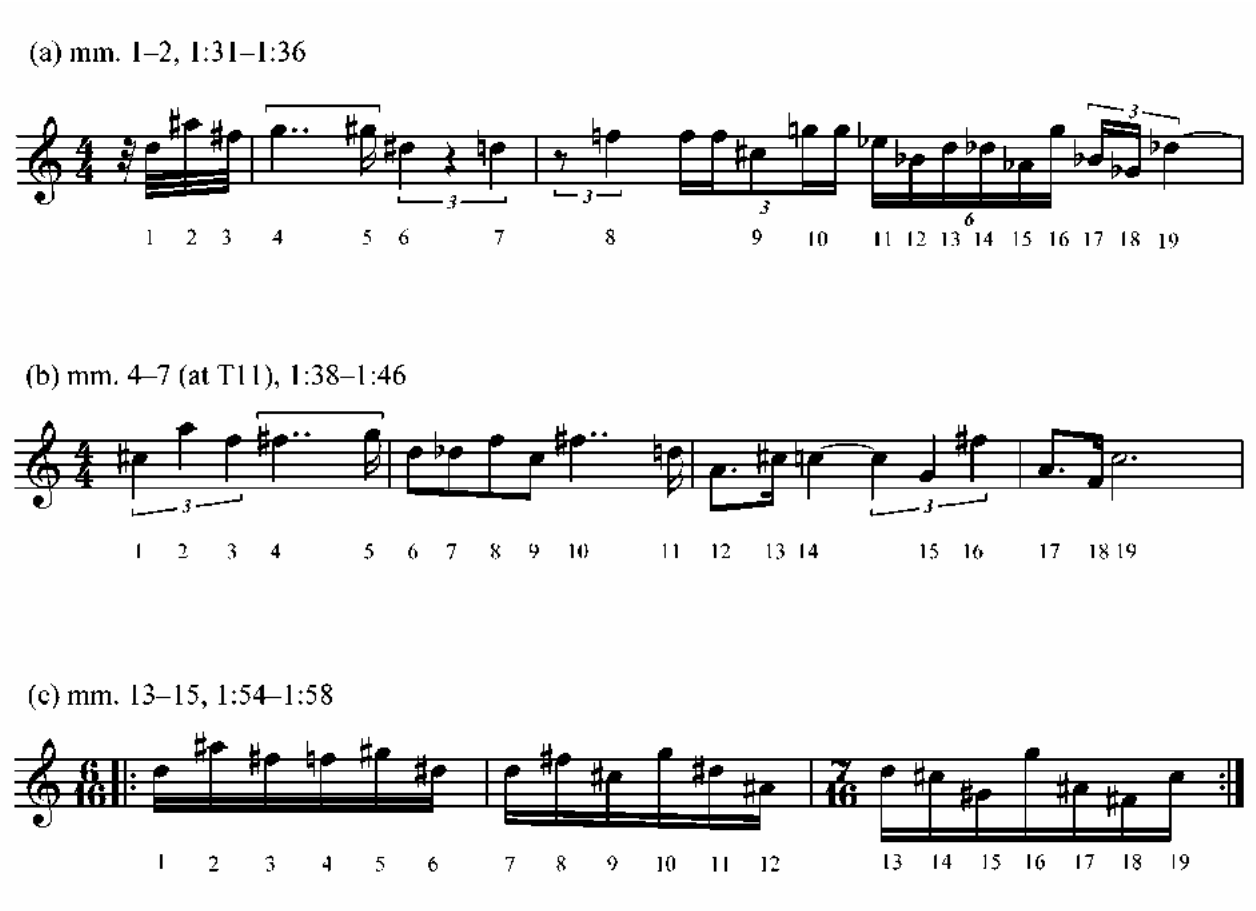
Example 2.8a. “The Black Page #1” (*Zappa in New York):*
contour-related segments.

Example 2.8b. “The Black Page #2” (*Zappa in New York)*:
corresponding phrases.



Example 2.9. “Oh No”:
thematic statements related by isomelism.

Example 2.10. “Jumbo Go Away” (*You Are What You Is)*:
isomelic variations.



Example 2.11. “Be-Bop Tango” (*Roxy & Elsewhere)*:
thematic statements related by isomelism.

Example 2.12. “Manx Needs Women” (*Zappa in New York)*:
recapitulation through isomelic restatement.

Example 2.13. “Big Swifty” (*You Can’t Do That on Stage Anymore Vol. 1*):
improvised recapitulation via isomelism.

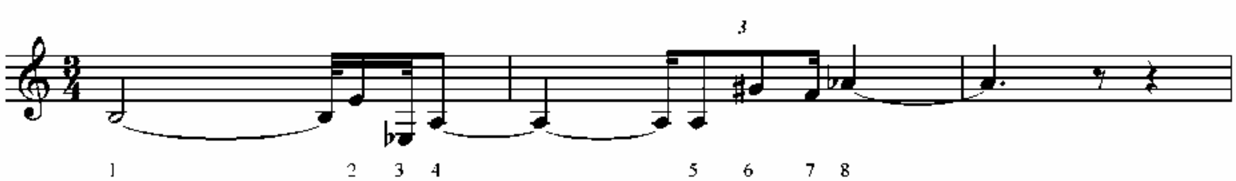
Example 2.14. “Mo ‘N’ Herb’s Vacation I” (*London Symphony Orchestra)*:
isomelic relationships within A and A' sections.

(a) m. 25 from A section, 1:43–1:46

(b) m. 63 from A' section, 3:55–4:00: isomelic variation (at T6) of (a)

Example 2.15. “Mo ‘N’ Herb’s Vacation I” (*London Symphony Orchestra)*:
isomelic relationships within B section.

(a) mm. 37–39, 2:32–2:38, beginning of B section



(b), mm. 56–59, 3:31–3:38, end of B section

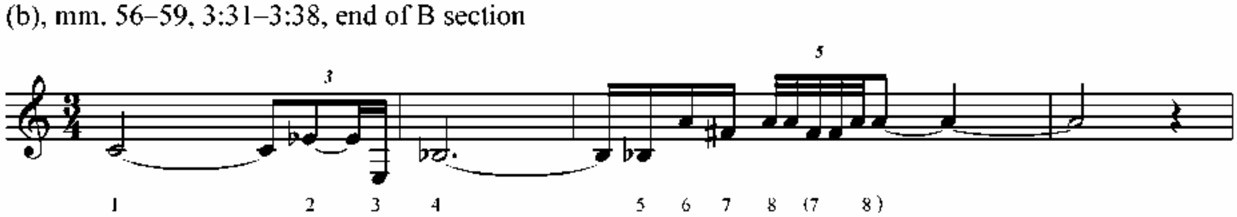


Figure 2.1. “Inca Roads” formal outline:
(a) (*The Lost Episodes*)
(b) (*One Size Fits All*), isomelic variations in bold.

(a)

A			B			A'		
Theme 1 (part 1)	Link	Theme 1 (part 2)	Transition	Trombone/Flute Solo	Theme 2	Theme 1 (part 1)	Link	Theme 1 (part 2)
0:00	0:15	0:19	1:08	1:22	2:36	2:54	3:11	3:14

(b)

Theme 1 (parts 1, 2)	**Link**	Guitar Solo	**Link**	**Theme 1 (part 2)**	A section	**Theme 2**	B section	A' section
0:31	1:43	2:00	5:09	5:27	5:41	6:05	6:23	8:05

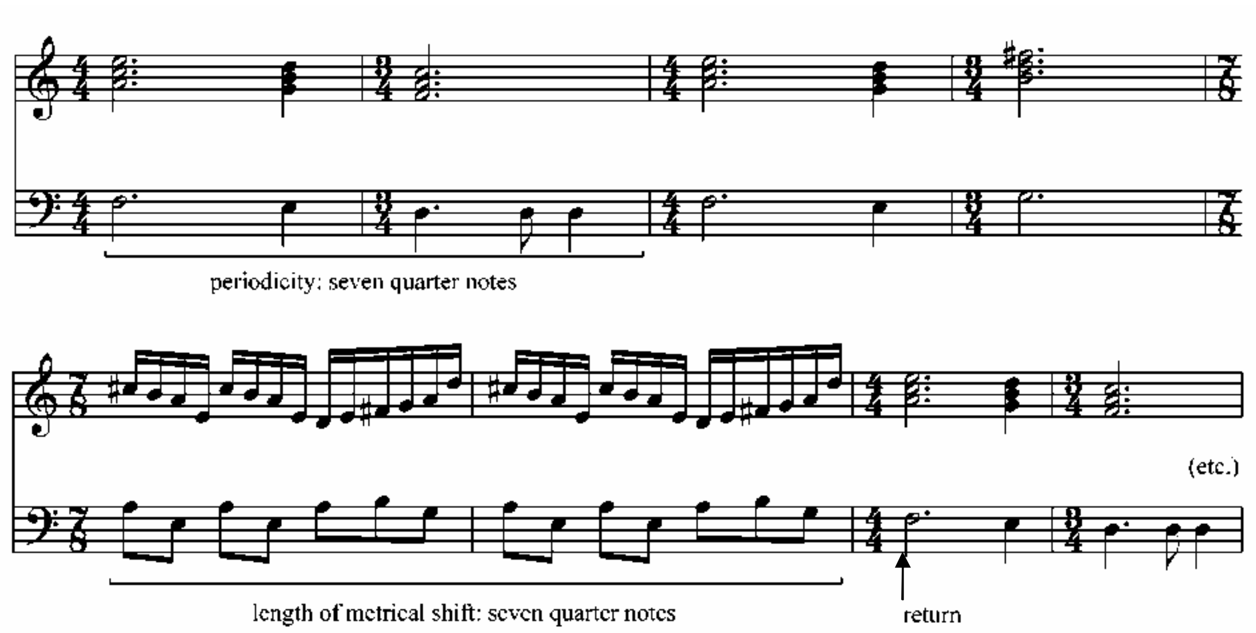
Example 2.16. “Inca Roads”:
isomelic variation of link.

Example 3.1. “Oh No” mm. 1–6.

Example 3.2. “Dog Breath, In the Year of the Plague” (a)
and “The Dog Breath Variations” (b).

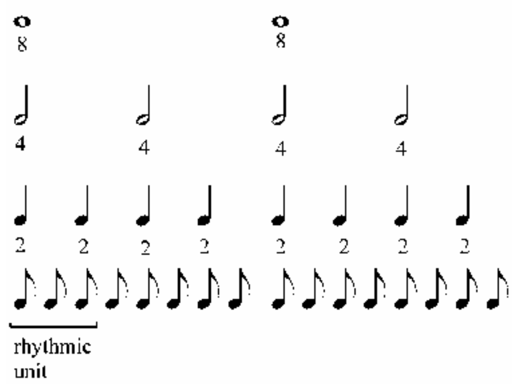
Example 3.3. “Pound for a Brown” main theme (*Uncle Meat* 0:05–0:15): polymetrical texture.

Example 3.4. “Oh No” (*Weasels Ripped My Flesh* (0:55–1:08).

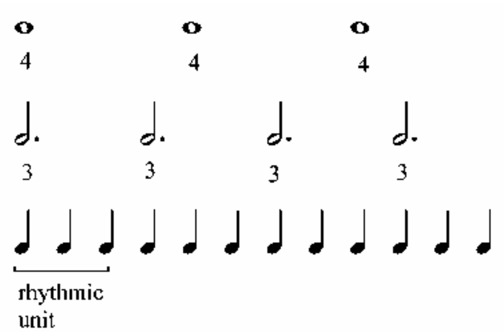


Example 3.5. “Oh No” (*Weasels Ripped My Flesh* 1:25–1:44).

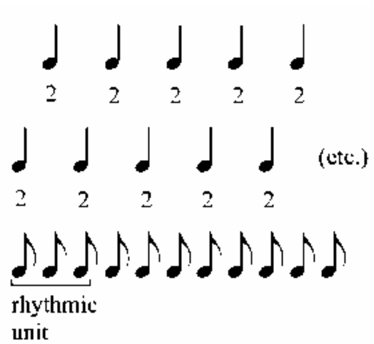
Example 3.6. Metrical consonance.



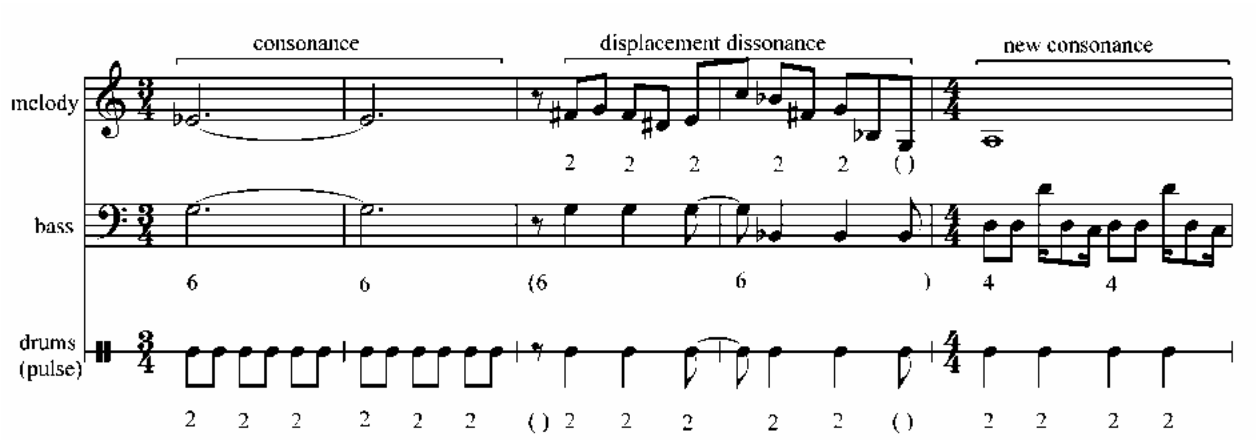
Example 3.7. Grouping dissonance G4/3.



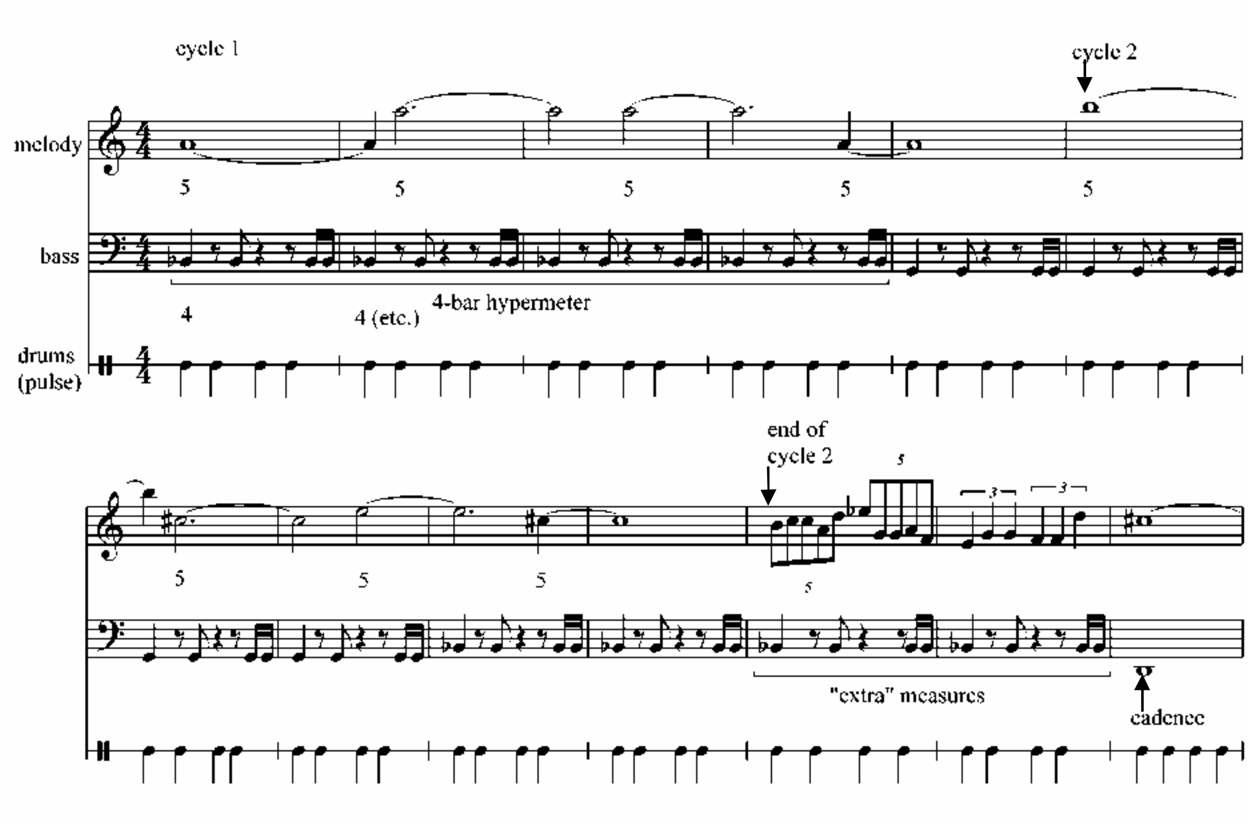
Example 3.8. Displacement dissonance D2+1



Example 3.9. “Moggio” (*The Man from Utopia* 1:47–1:53):
displacement dissonance D2+1.

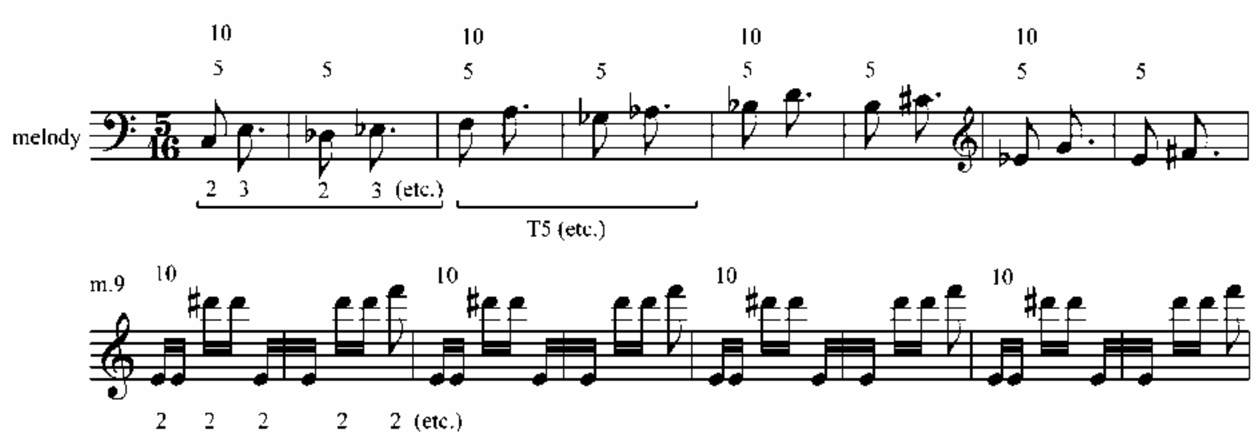


Example 3.10. “The Black Page #2” (*Zappa in New York* 2:02–2:24): metrical dissonance G5/4.

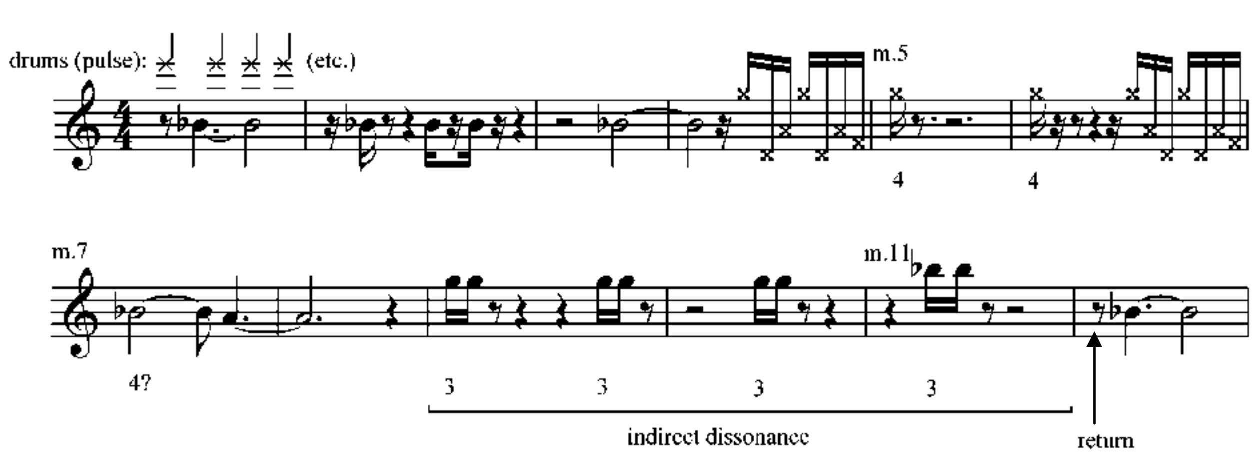


Example 3.11. "Echidna's Arf (Of You)" (*Roxy & Elsewhere* 3:23–3:30): grouping dissonance G9/5.

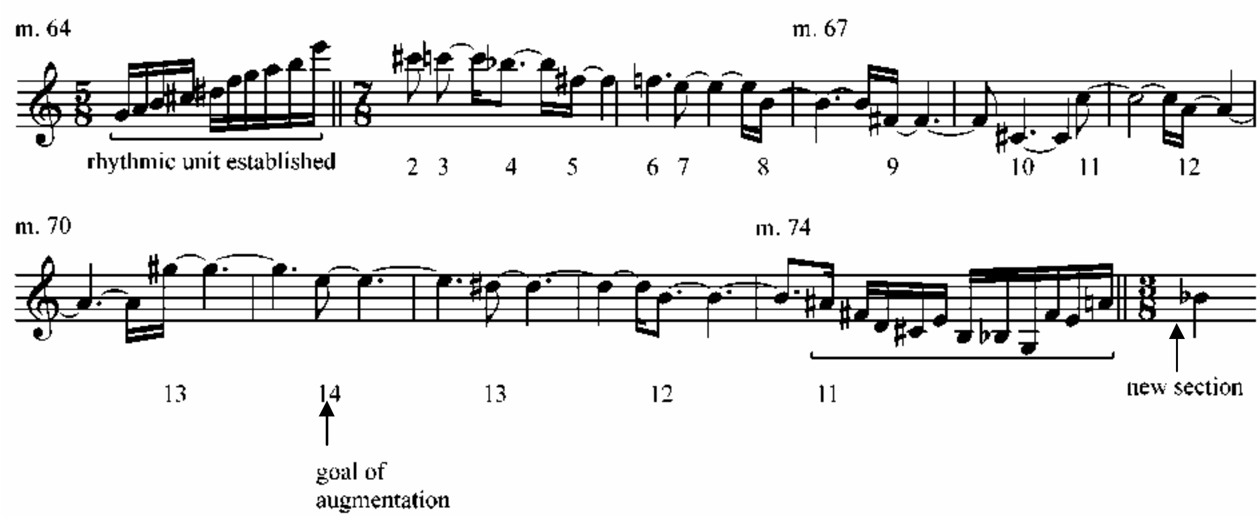
Example 3.12. "T'Mershi Duween" (*You Can't Do That on Stage Anymore Vol. 2* 0:13–0:21): indirect dissonance.



Example 3.13. “Approximate” mm. 1–12.



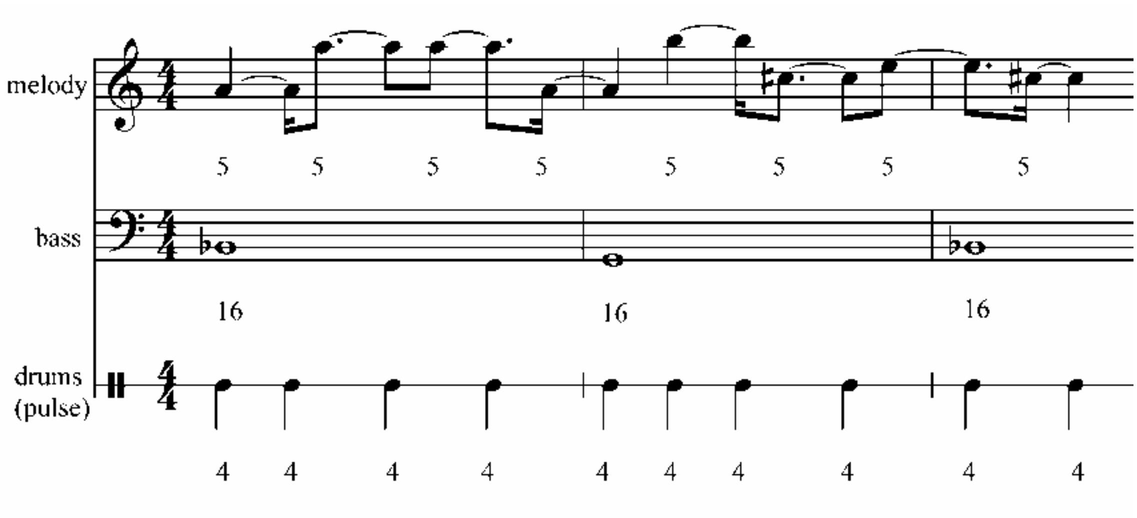
Example 3.14. “Sinister Footwear I” mm. 64–75.



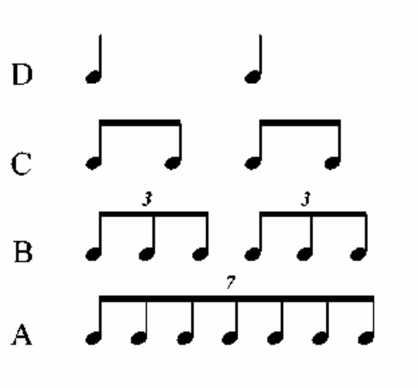
Example 3.15. “Approximate” (*YCDTOSA Vol. 2* 0:30–0:40).

Example 3.16. “The Eric Dolphy Memorial Barbecue”
(*Weasels Ripped My Flesh* 0:07–0:18): progressive rhythmic augmentation.

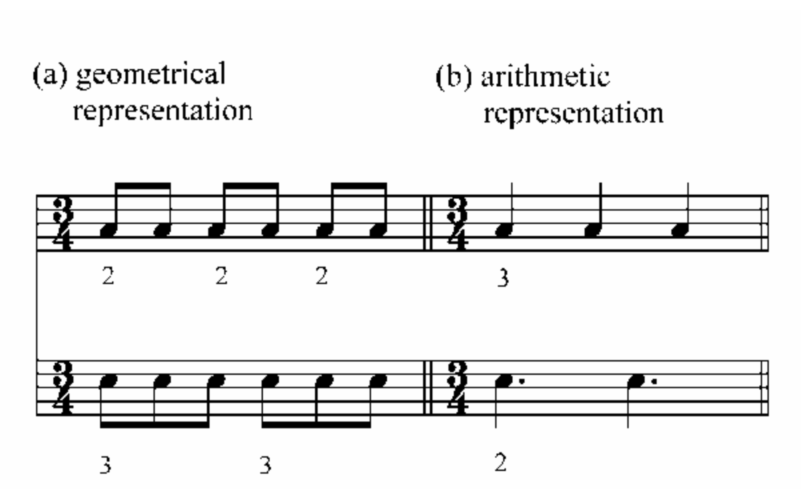
Example 3.17. "The Black Page #1" mm. 6–8 (*Zappa in New York* 2:12–2:21).



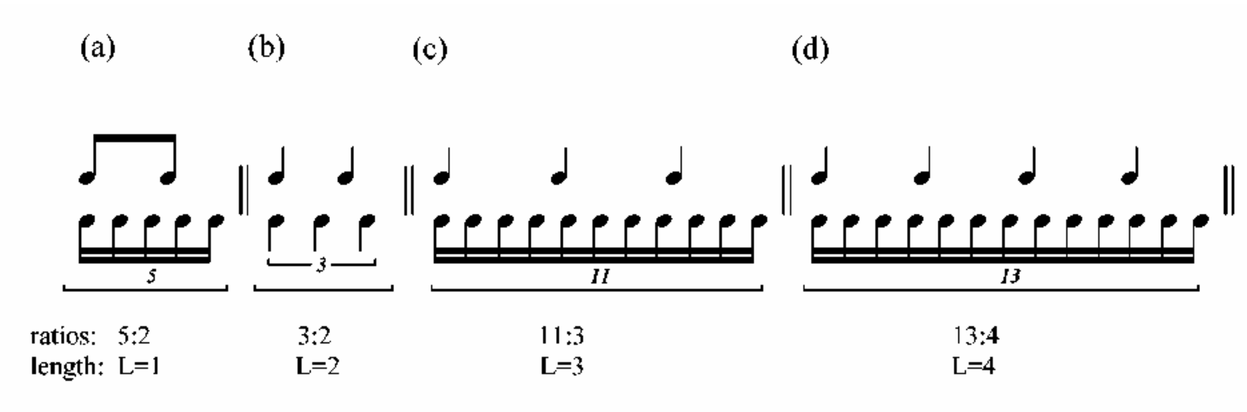
Example 3.18. Yeston's Example 4.2.



Example 3.19. Geometrical and arithmetic conceptions of hemiola.



Example 3.20. Rhythmic dissonances.



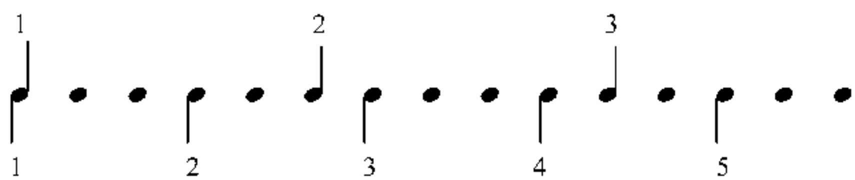
Example 3.21. Zappa's demonstration of 5-over-3.

(a) exchange between Zappa (Z) and interviewer (I)

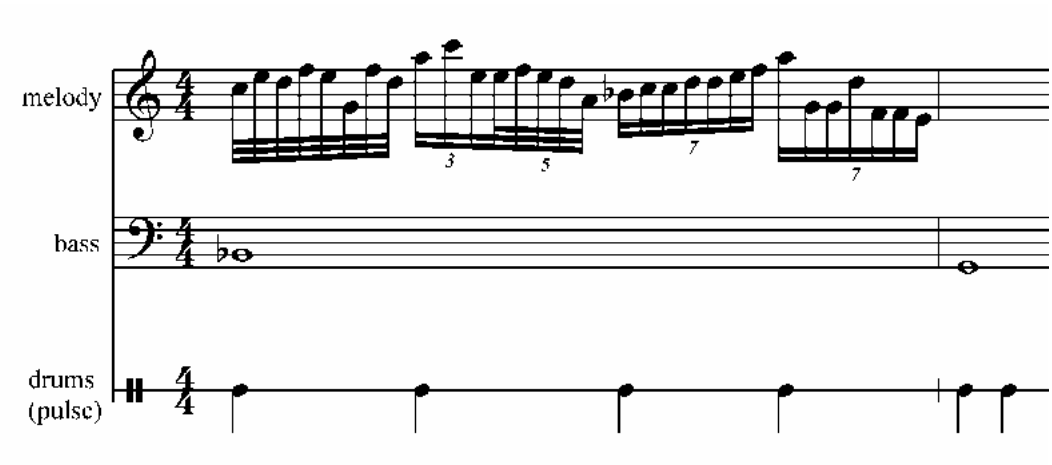
I: How can you illustrate this?
Z: Well, draw fifteen dots on a piece of paper

Z: Draw stems coming up from every fifth one on the top, and stems coming down from every third one on the bottom, and you'll see the effect of five over three:

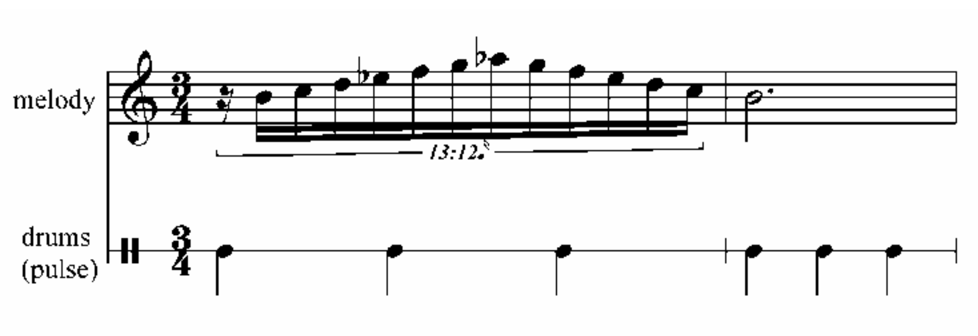
(b) correct realization



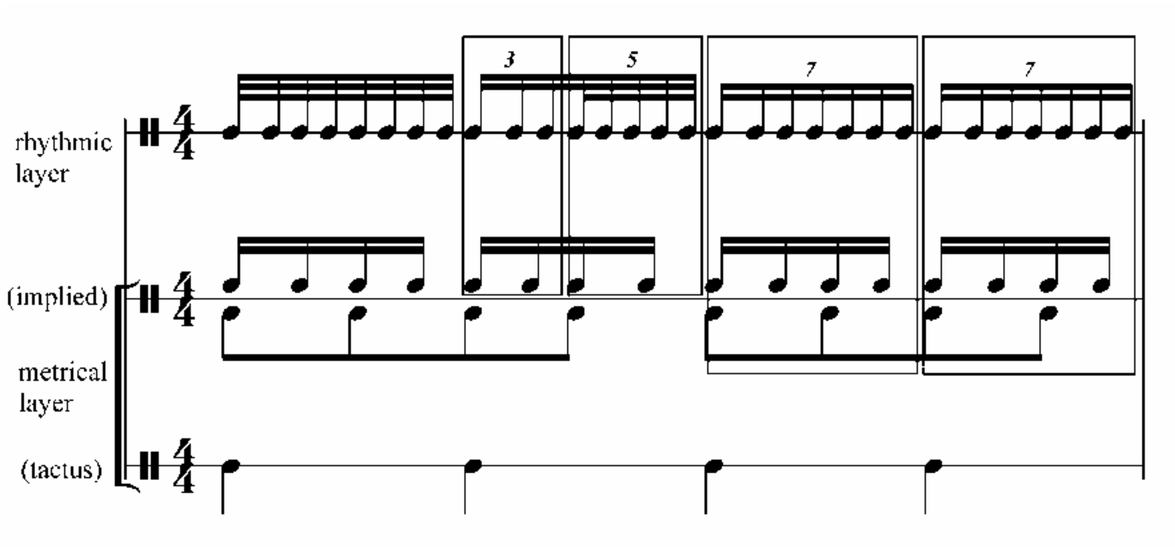
Example 3.22. “The Black Page #1” m. 4 (*Zappa in New York* 2:03–2:09).



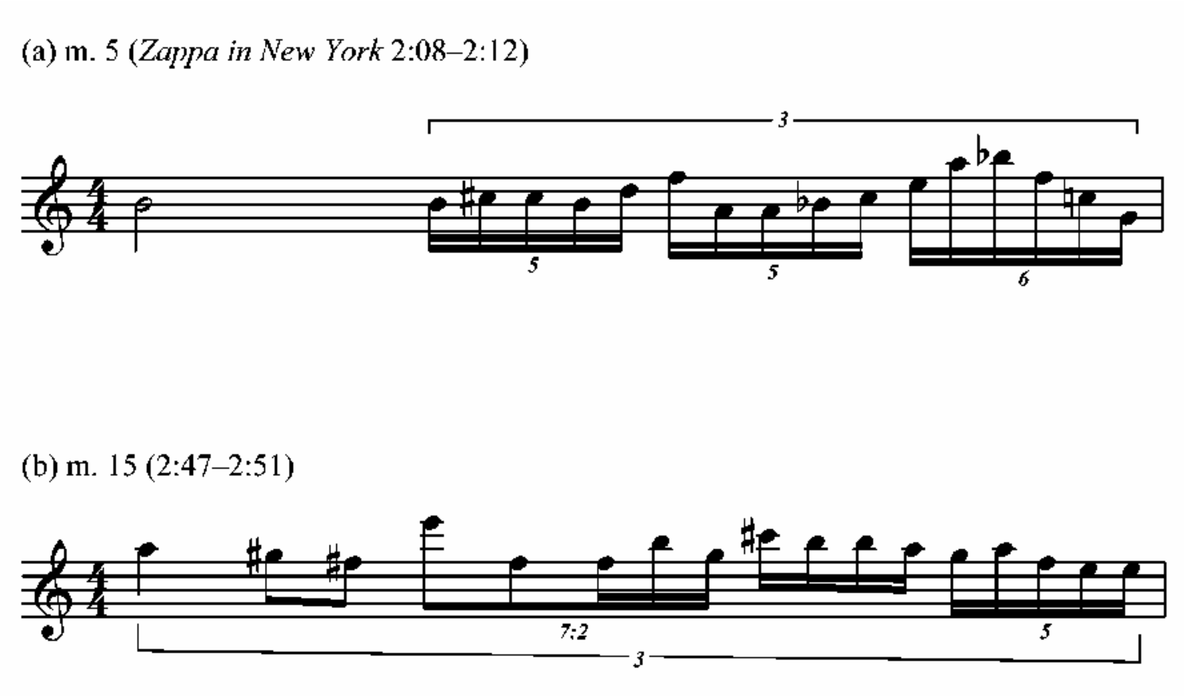
Example 3.23. “Sinister Footwear II” (*Them or Us* 7:24–7:27).



Example 3.24. "The Black Page #1" m. 4: resulting rhythmic dissonances.



Example 3.25. "The Black Page #1": nested dissonances.



Example 3.26. Bass accompaniment to “The Black Page #2.”

Example 3.27. “The Black Page #2” (*Zappa in New York* 1:47–1:55):
ratios of notational augmentation.

Example 3.28. “The Black Page”: corresponding phrases of
(a) “#1” and (b) “#2.”

Figure 3.1

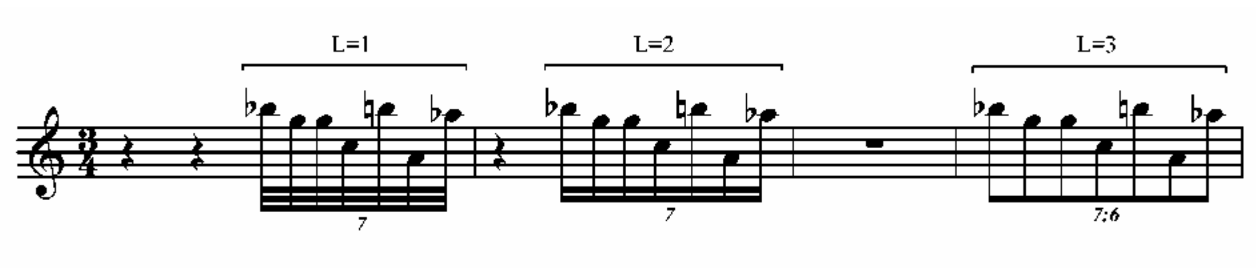
(a) Rhythmic dissonances in 4/4 meter (tactus = quarter)

L=1/2	L=1	L=2	L=4
3	3	3	11
5	5	5	
6	7	7	
	9	9	
	11	11	
	13	13	
	6	15	
	10	17	
		10	
		14	

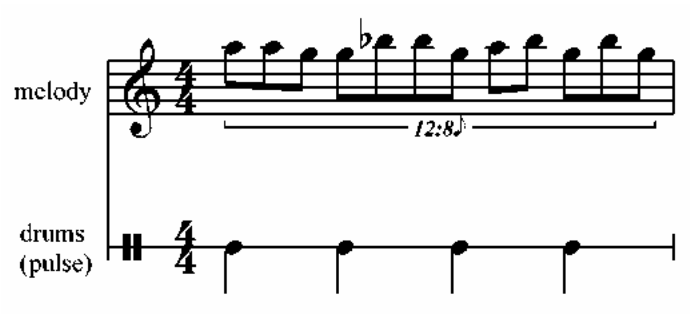
(b) Rhythmic dissonances in 3/4 meter (tactus = quarter)

L=1/2	L=1	L=2	L=3
3	3	3	5
5	5	5	7
	7	7	8
		9	10
		11	11
		13	13

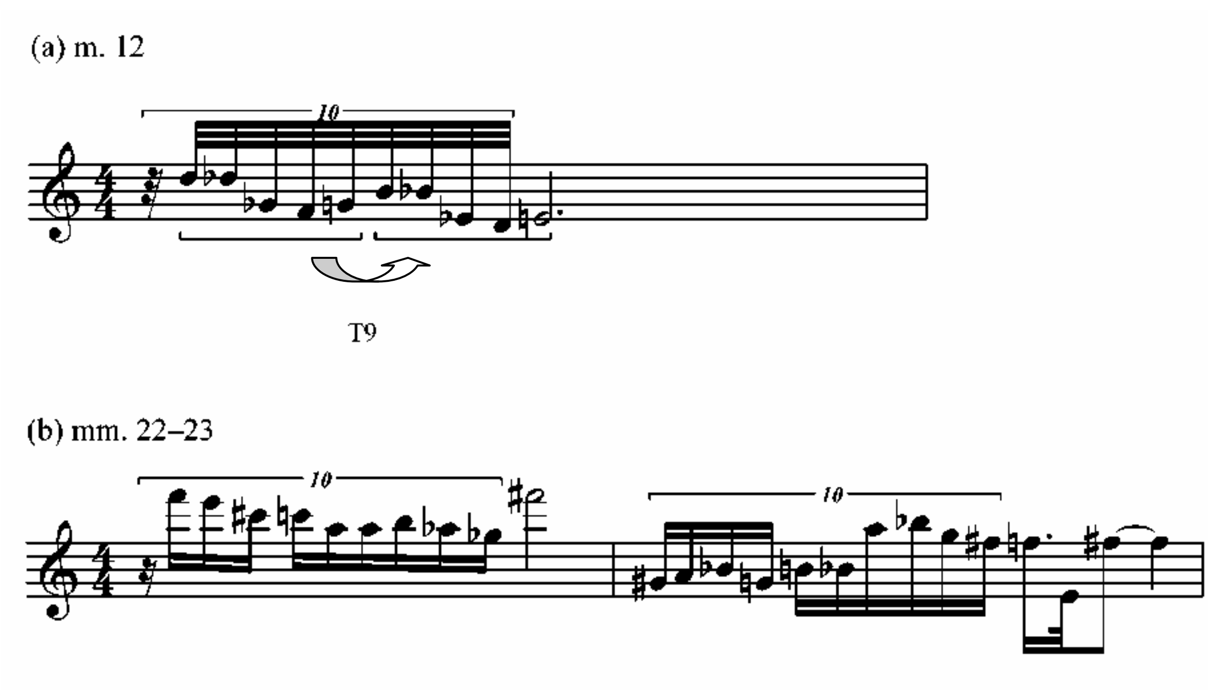
Example 3.29. "Pedro's Dowry" mm. 59–62 (*London Symphony Orchestra* 3:20–3:35): rhythmic augmentation.



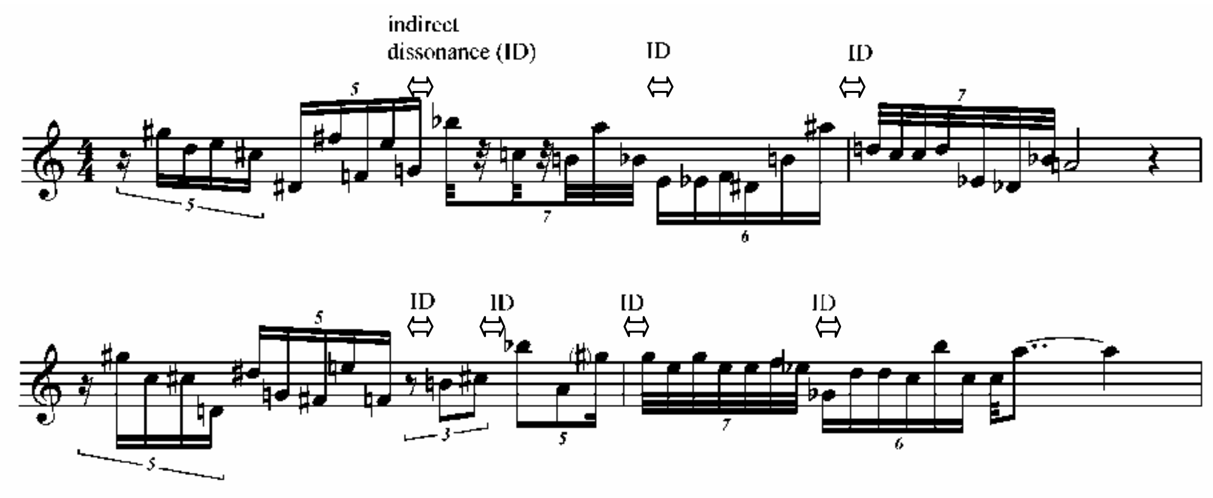
Example 3.30. Zappa’s beaming of “Alien Orifice” m. 4.



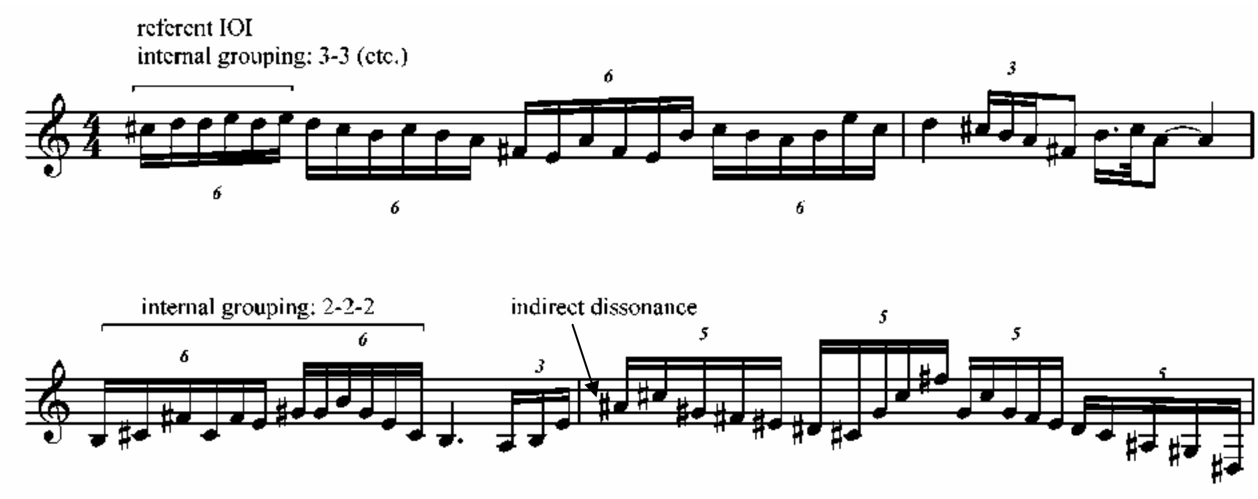
Example 3.31. Internal groupings of L=2 subdivisions of 10
in “Mo ‘N’ Herb’s Vacation I.”



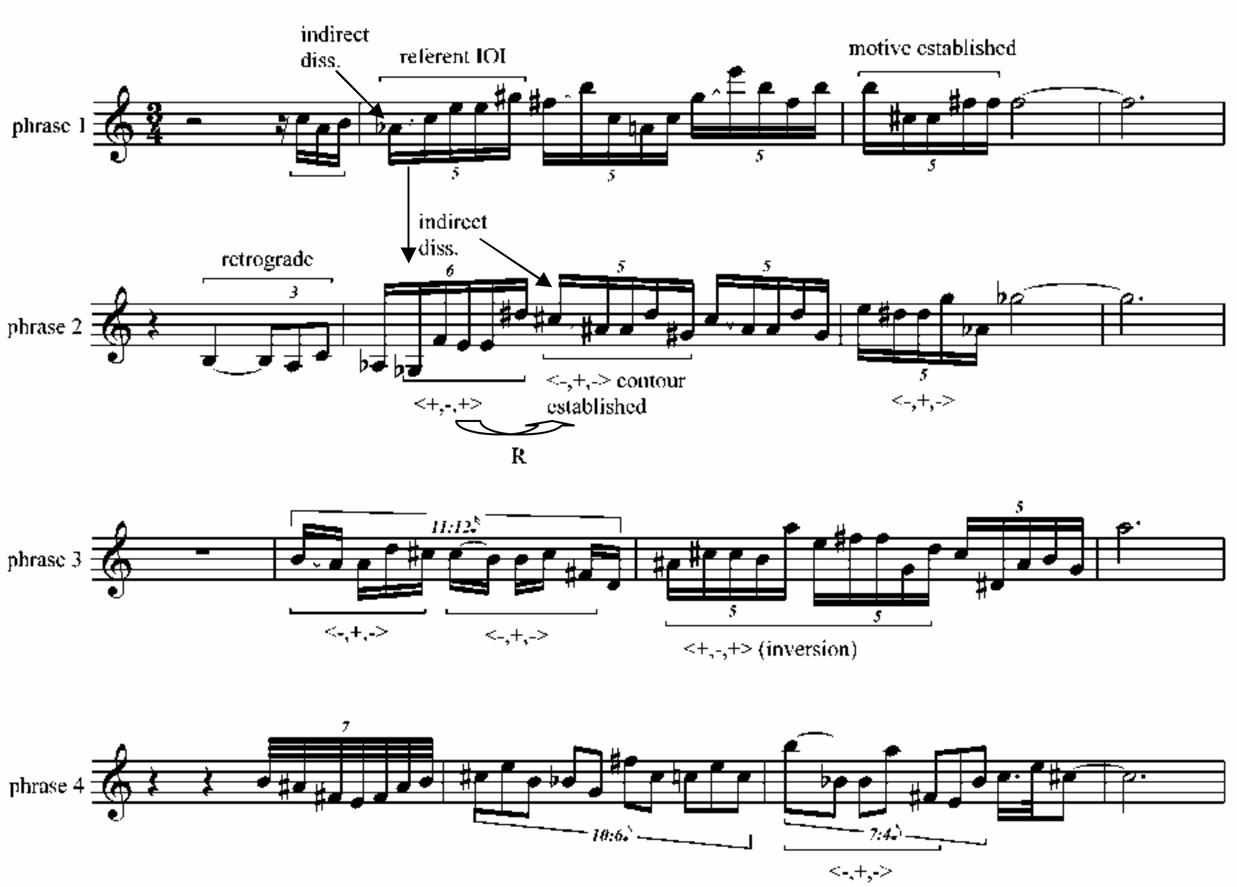
Example 3.32. “Be-Bop Tango” mm. 31–34 (*Roxy & Elsewhere* 2:40–2:50).



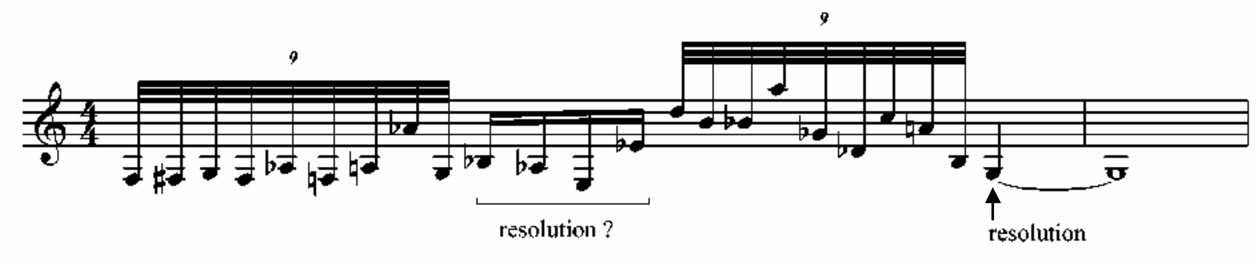
Example 3.33. “Montana” (*Over-Nite Sensation* 3:55–4:07).



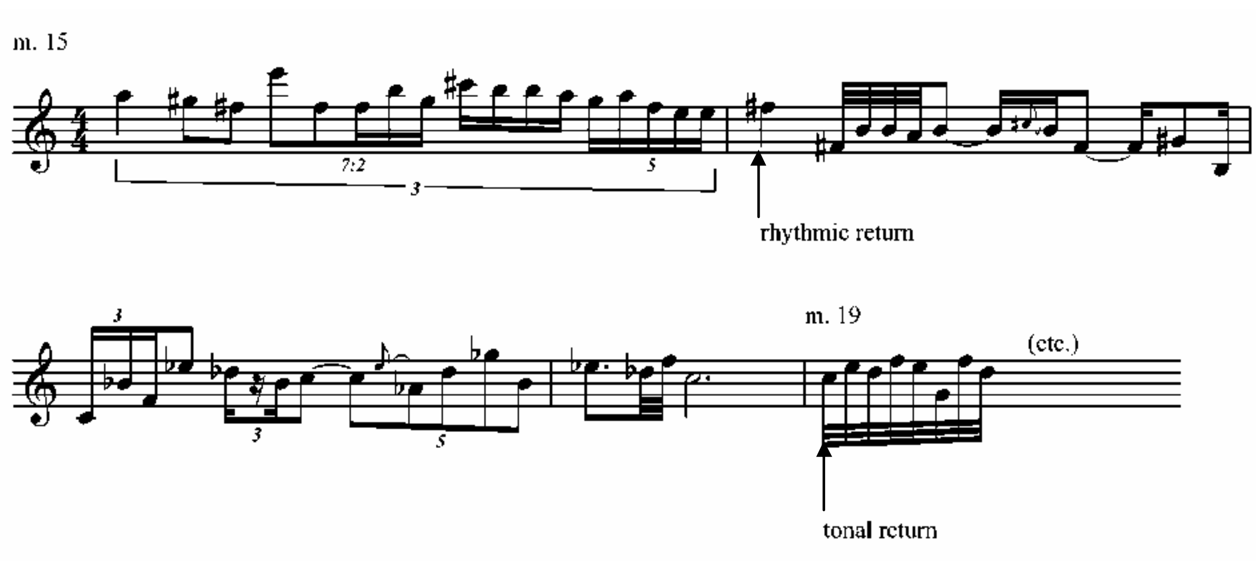
Example 3.34. “Sinister Footwear II” mm. 33–48 (*Them or Us* 1:11–1:42).



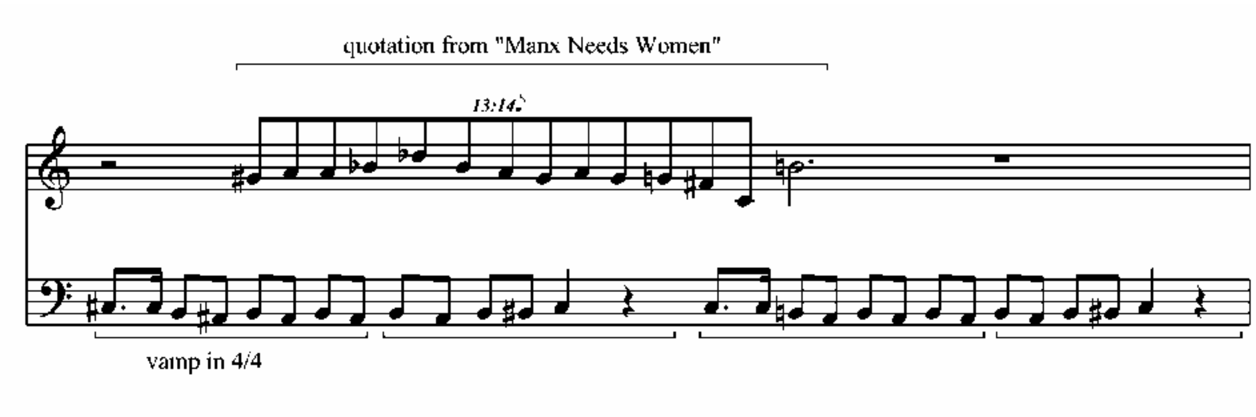
Example 3.35. "Mo 'N' Herb's Vacation" mm. 13–14 (*London Symphony Orchestra* 0:51–0:55).



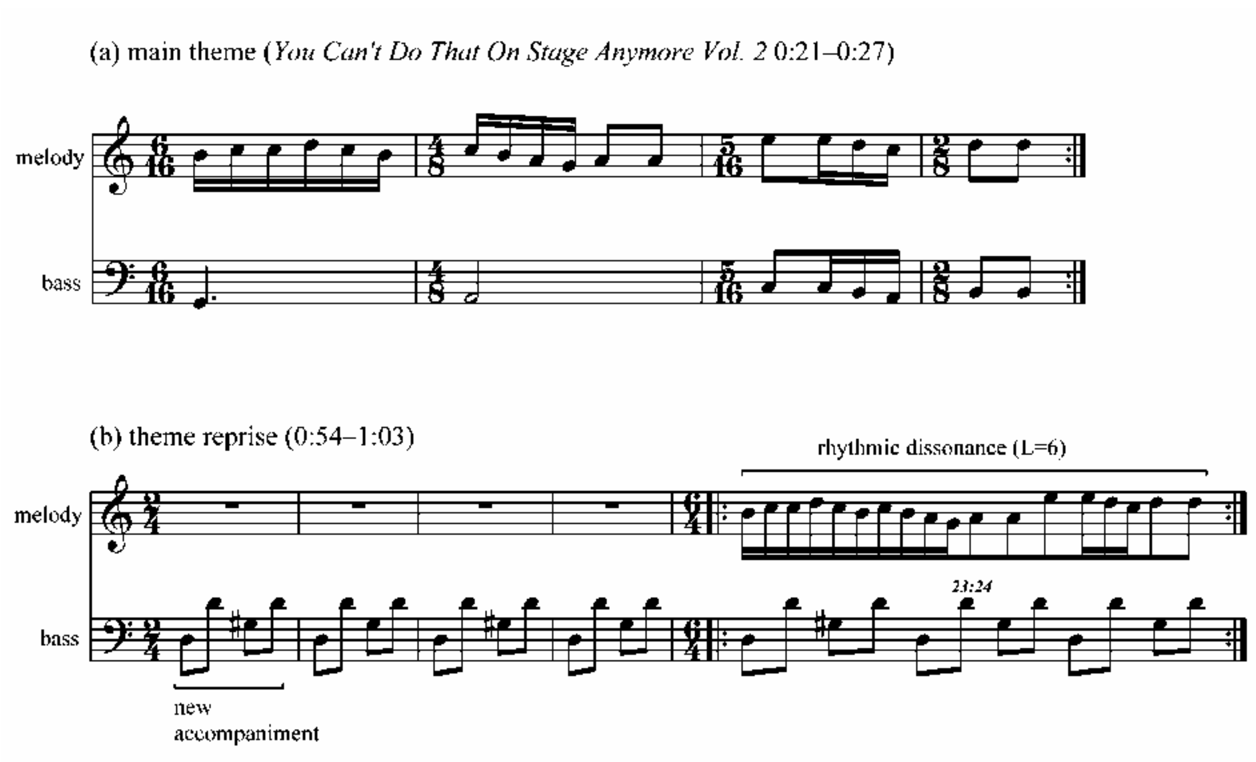
Example 3.36. "The Black Page #1" mm. 15–19 (*Zappa in New York* 2:47–3:03).



Example 3.37. “Dancin’ Fool” (*You Can’t Do That on Stage Anymore* Vol. 5 1:20–1:26).

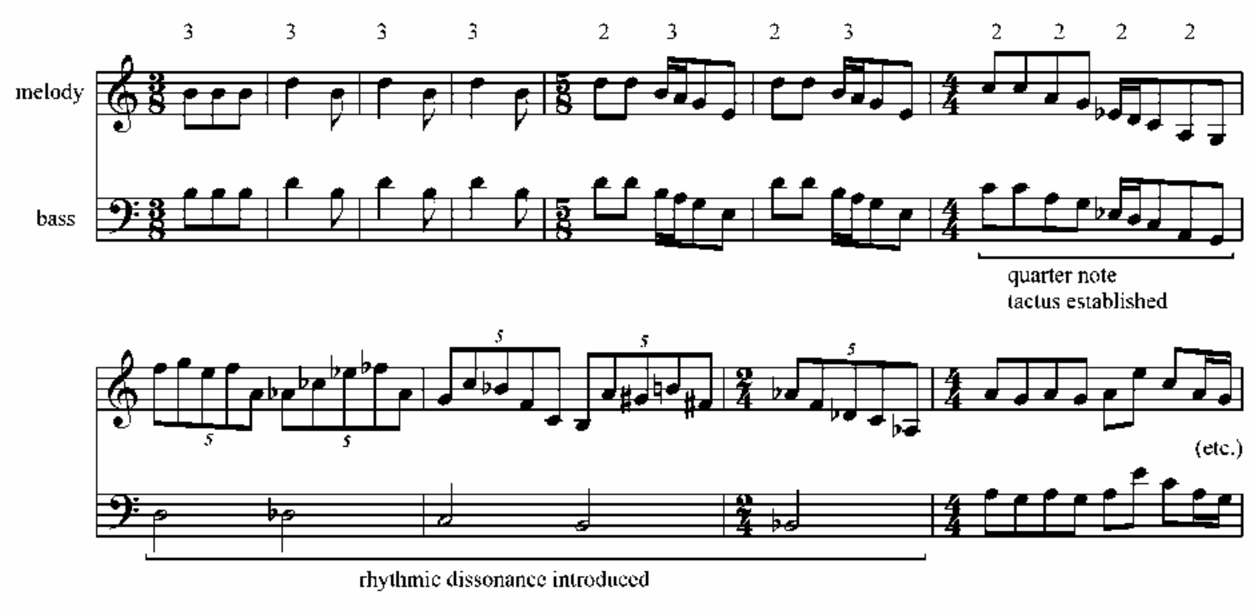


Example 3.38. “T’mershi Duween”: statements of main theme.

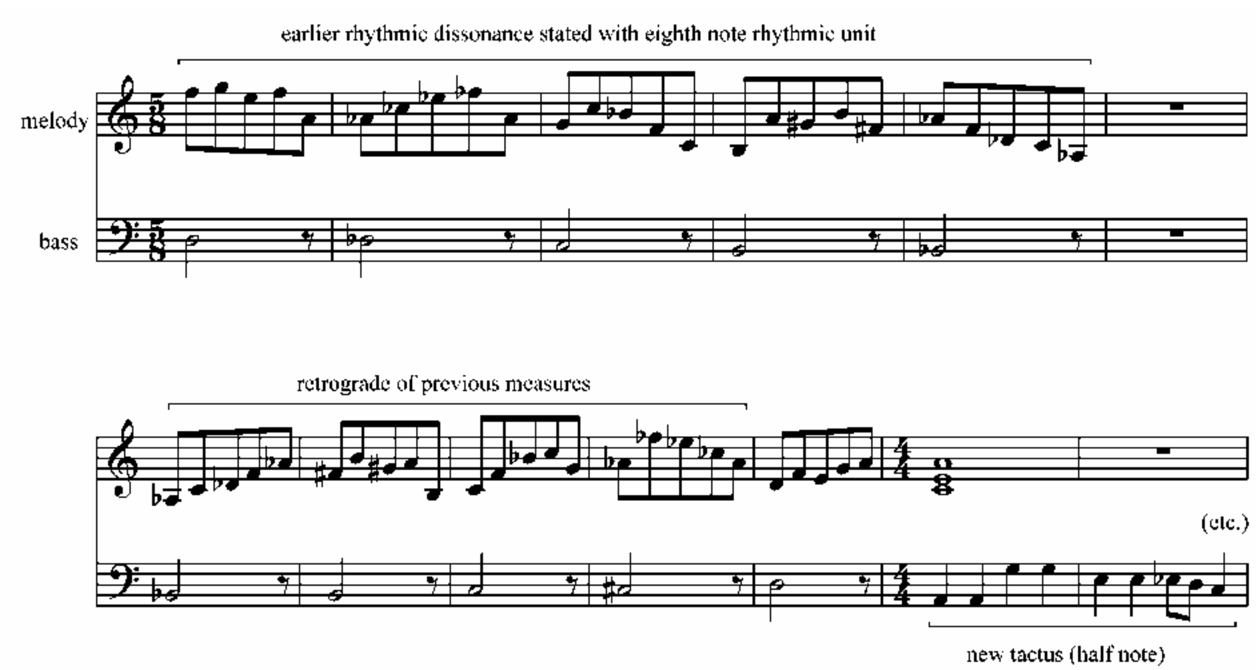


Example 3.39. “Inca Roads” (*One Size Fits All* 5:45–5:55).

Example 3.40. "Zombie Woof" introduction.



Example 3.41. "Zombie Woof" (*Over-Nite Sensation* 0:58–1:08).



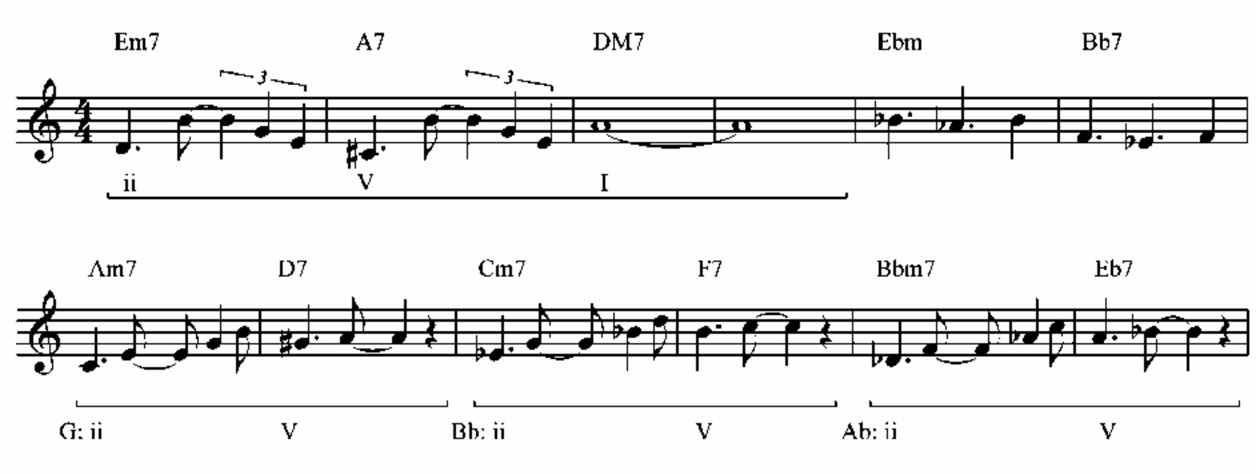
Example 3.42. “Alien Orifice” (*Frank Zappa Meets the Mothers of Prevention* 2:32–3:02).

Example 3.43.

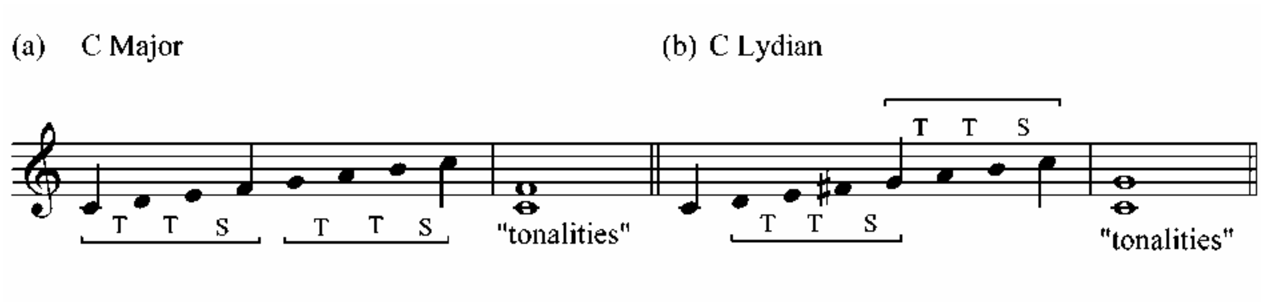
(a) "Outrage at Valdez" mm. 54–55 (*The Yellow Shark* 2:39–2:48)

(b) "Get Whitey" mm. 20–21 (*The Yellow Shark* 1:30–1:40)

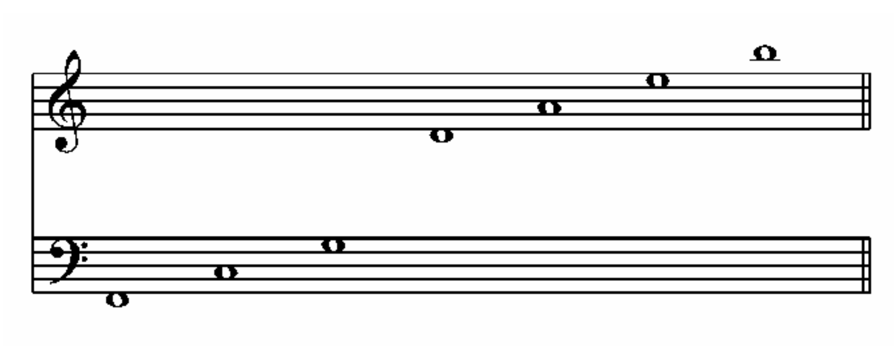
Example 4.1. “America Drinks & Goes Home” (*Absolutely Free* 0:12–0:35).



Example 4.2. Tetrachordal structure of major and Lydian scales.



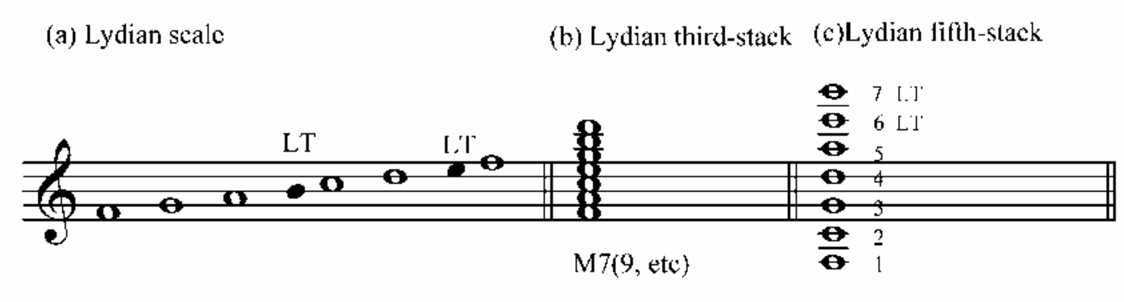
Example 4.3. Cycle of fifths generation of Lydian scale.



Example 4.4. George Russell's Lydian-based modal system.

I	**II**	**III**	**#IV**	**V**	**VI**	**VII**
M triad	7th (Mm)	Inversions	m 7 (b5)	Inversions	m triad	11th (b9)
M sixth	9th	of modal	7 (b9) (#11)	of modal	m sixth	7th (b9)
M 7th	11th	tonic I chords		tonic I chords	m 7th	
M 7 (#11)	13th				m 9th	
Major-chord family	Seventh-chord family				Minor-chord family	

Example 4.5. Three representations of the Lydian scale.



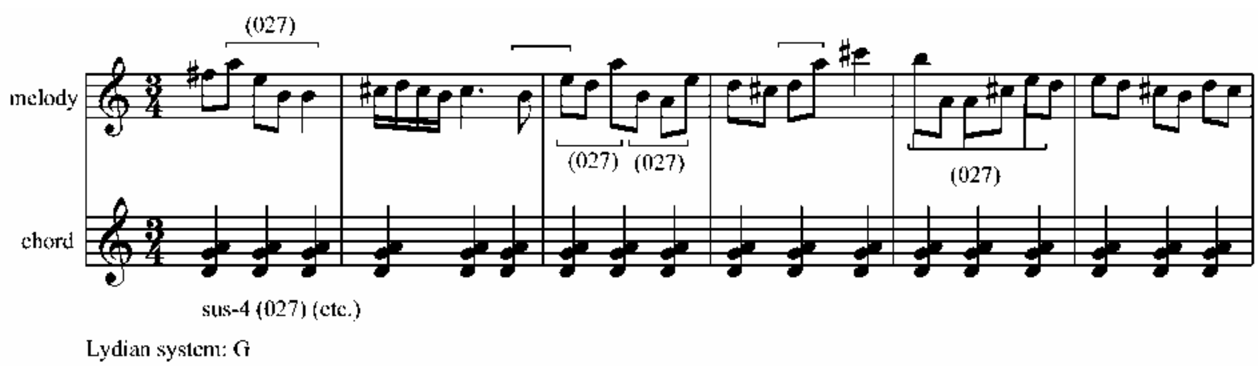
Example 4.6. The Lydian modal system (shown in F Lydian).

#	tonic	mode
7	B	N/A
6	E	N/A
5	A	Aeolian (?)
4	D	Dorian
3	G	Mixolydian
2	C	Ionian (?)
1	F	Lydian

Example 4.7. Three texturally stratified zones.

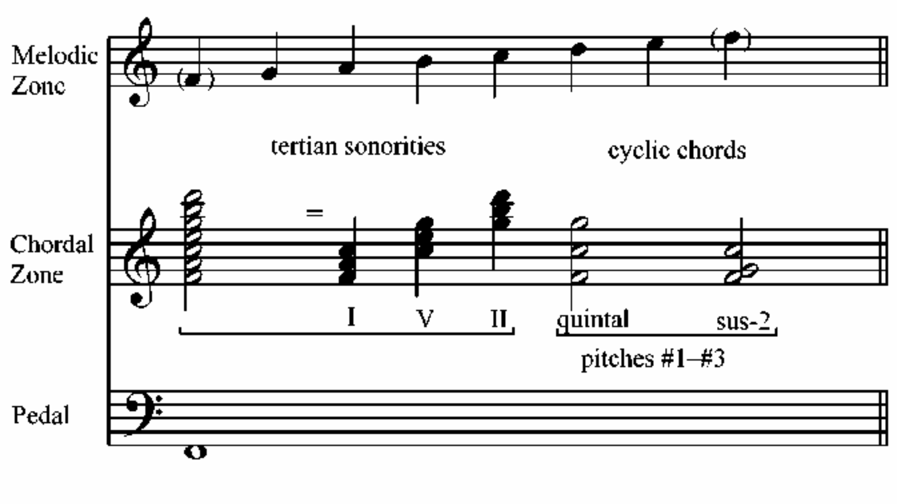
Melodic Zone	7-note diatonic set tonally ambiguous
Chordal Zone	three-note “rootless” chords
Pedal Zone	drone-like bass root representative tonic representative

Example 4.8. Melodic and chordal zones of “Uncle Meat” mm. 1–6.

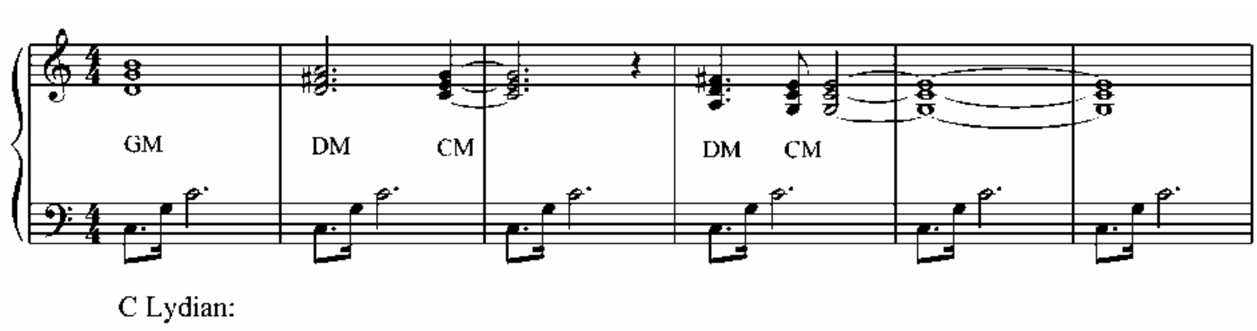


Example 4.9. “Holiday in Berlin”: adjacent thematic modules.

Example 4.10. Lydian (Mode I): basic pitch structures.

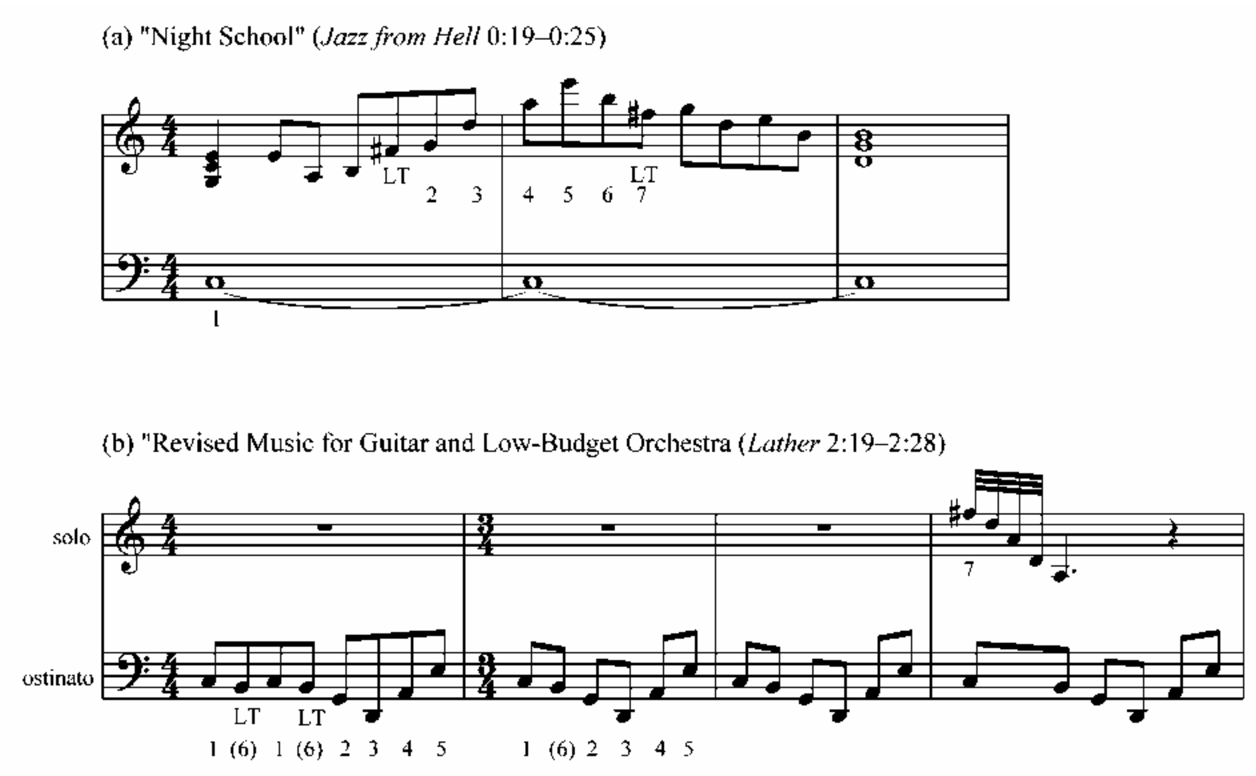


Example 4.11. "Night School" (*Jazz from Hell* 0:07–0:18): rondo chord progression.

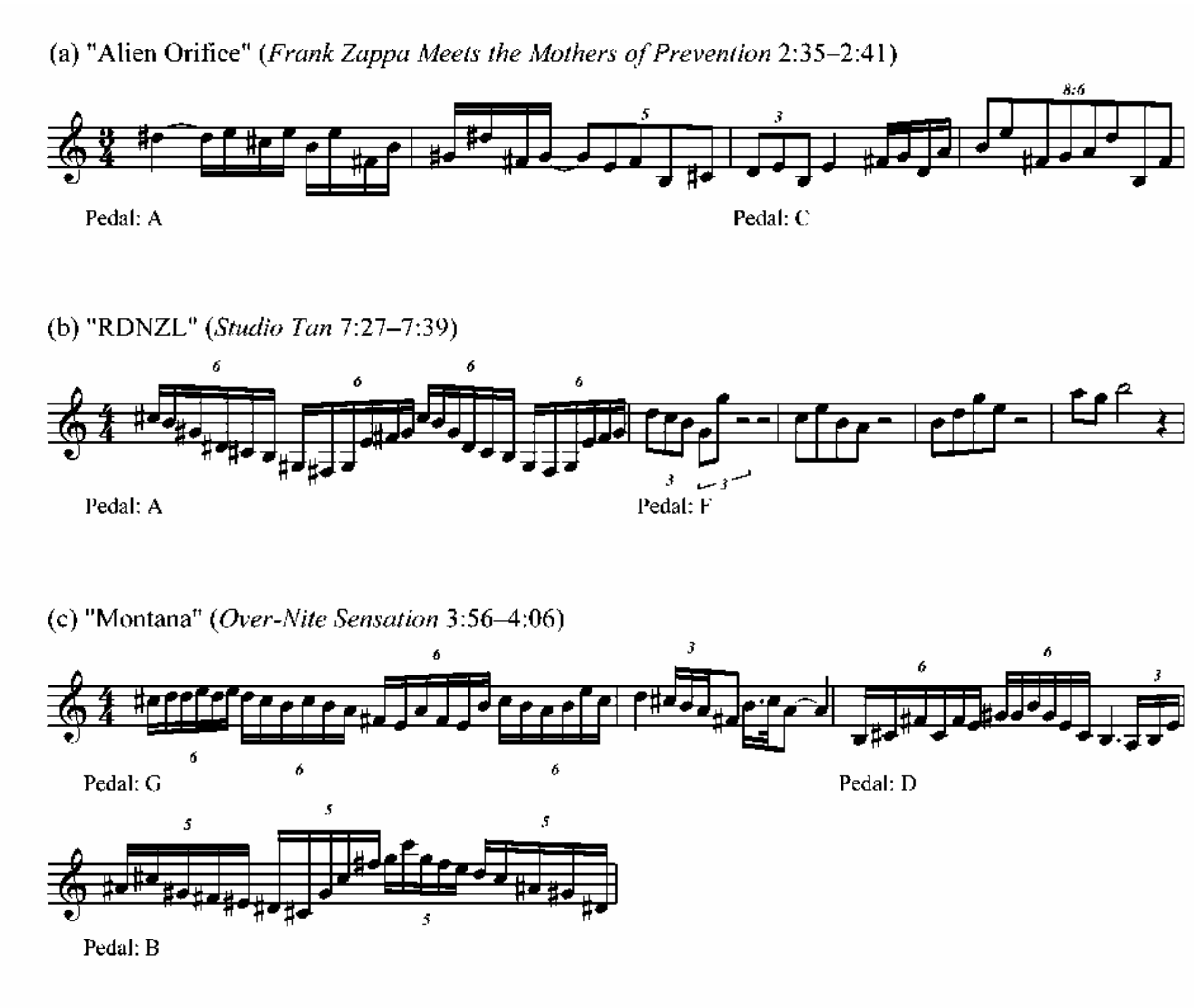


Example 4.12. “Re-Gyptian Strut” (*Läther* 0:24–0:42).

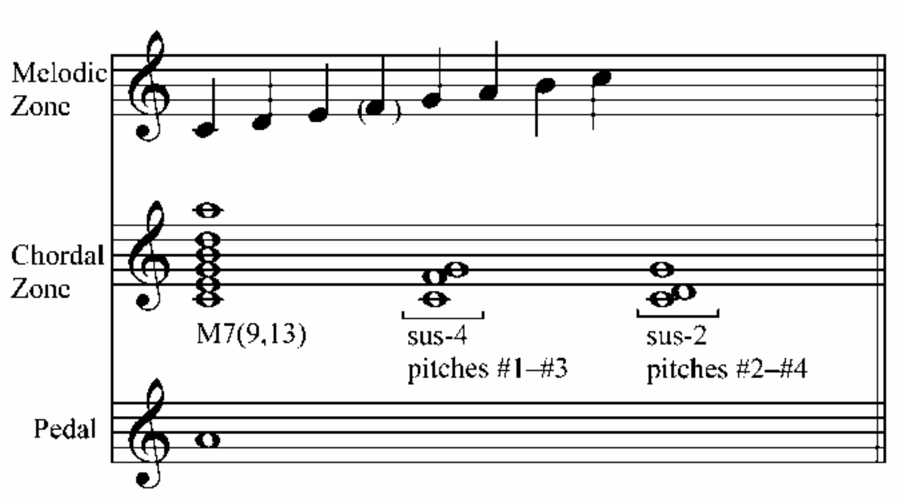
Example 4.13. T7-cyclic textures in Lydian.



Example 4.14. Melodic avoidance of Lydian tonic.



Example 4.15. Ionian (Mode II): basic pitch structures.



Example 4.16. Treatment of Ionian fourth above Ionian pedal.

(a) "Uncle Meat" (*Uncle Meat* 0:15–0:25)

Lydian system: Ab
Pedal: Eb Ionian

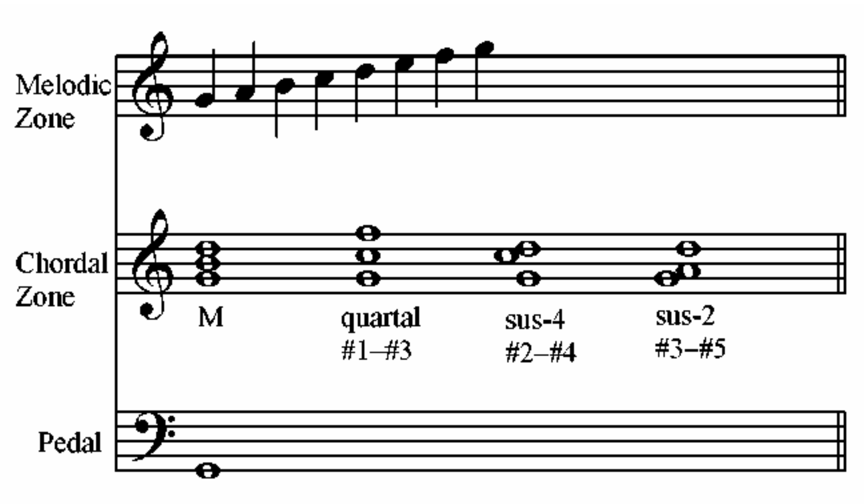
(b) "RDNZL" (*You Can't Do That on Stage Anymore Vol. 2* 0:18–0:28)

Lydian system: F
Pedal: C Ionian

(c) "RDNZL" (0:38–0:48)

Lydian system: G
Pedal: D Ionian

Example 4.17. Mixolydian (Mode III): basic pitch structures.

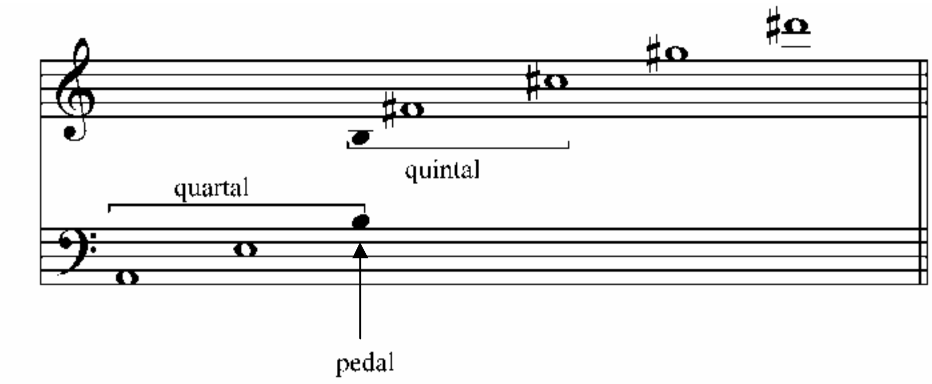


Example 4.18. "Little House I Used To Live In" (*Burnt Weeny Sandwich* 1:42–1:53).

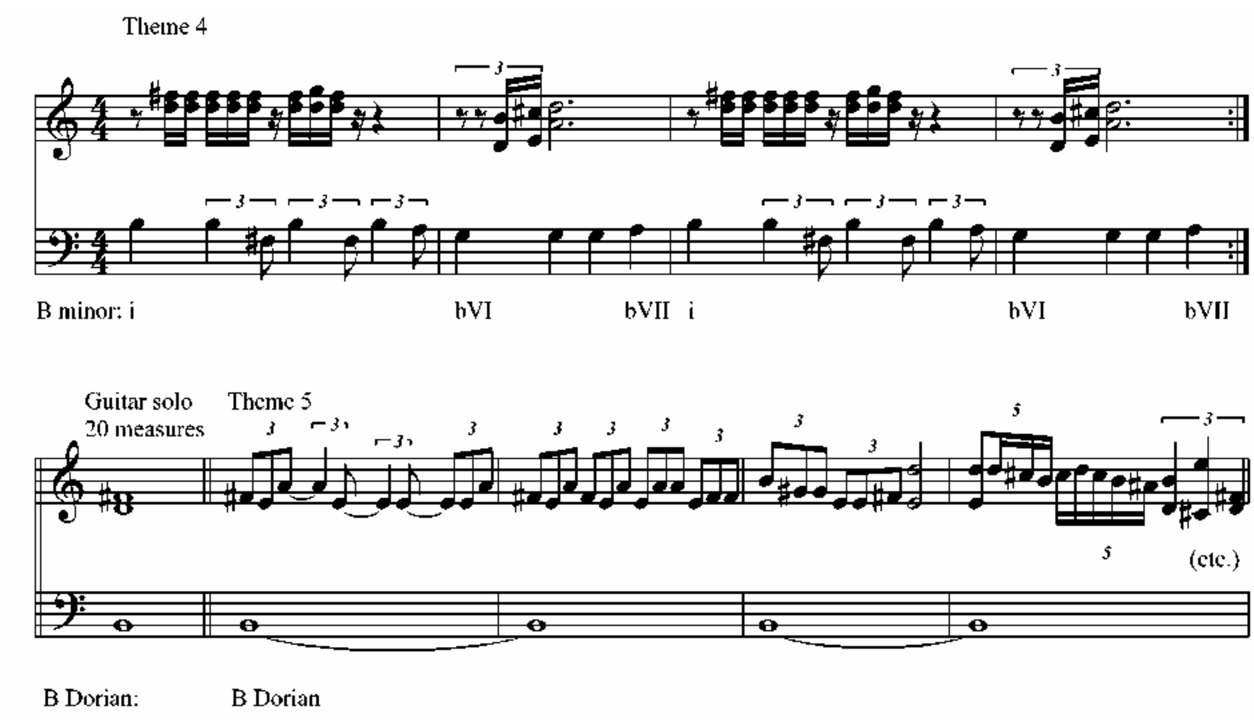
Example 4.19. “Pound for a Brown” (*Uncle Meat* 0:05–0:12).

Example 4.20. “One Man, One Vote”
(*Frank Zappa Meets the Mothers of Prevention* 0:11–0:16).

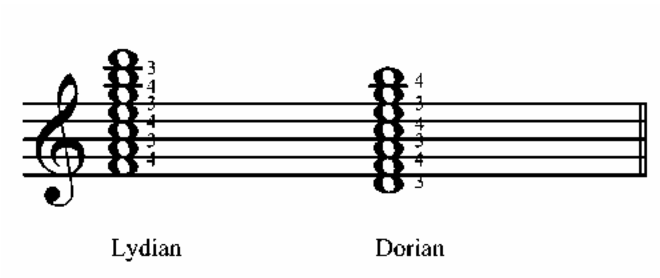
Example 4.21. Disposition of quintal and quartal chords in the Mixolydian mode: shown within A-Lydian fifth stack.



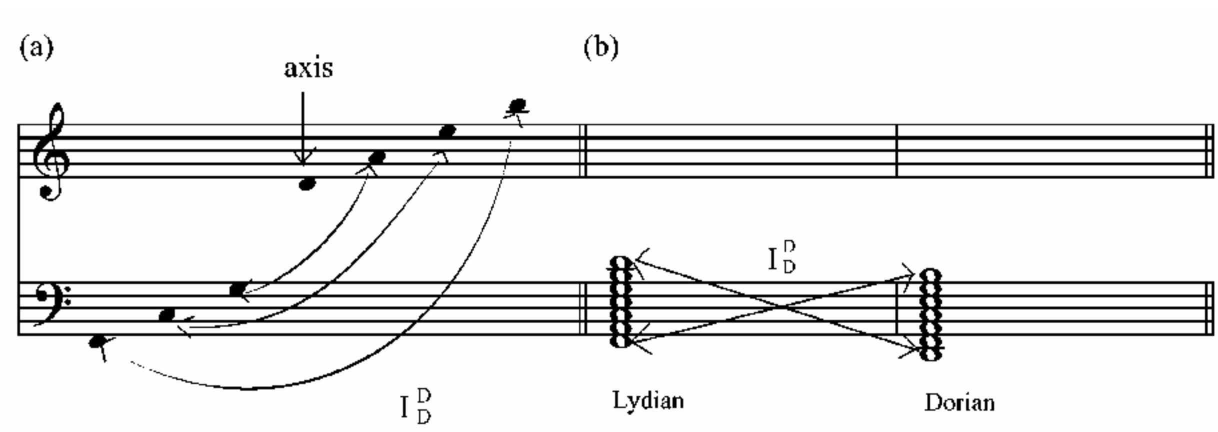
Example 4.22. 'The Grand Wazoo" (*The Grand Wazoo* 2:27–3:30).



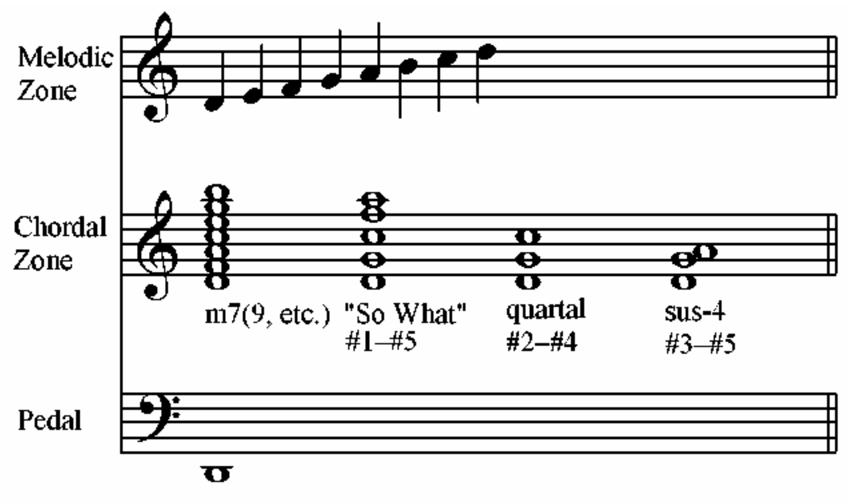
Example 4.23. Lydian and Dorian third-stacks.



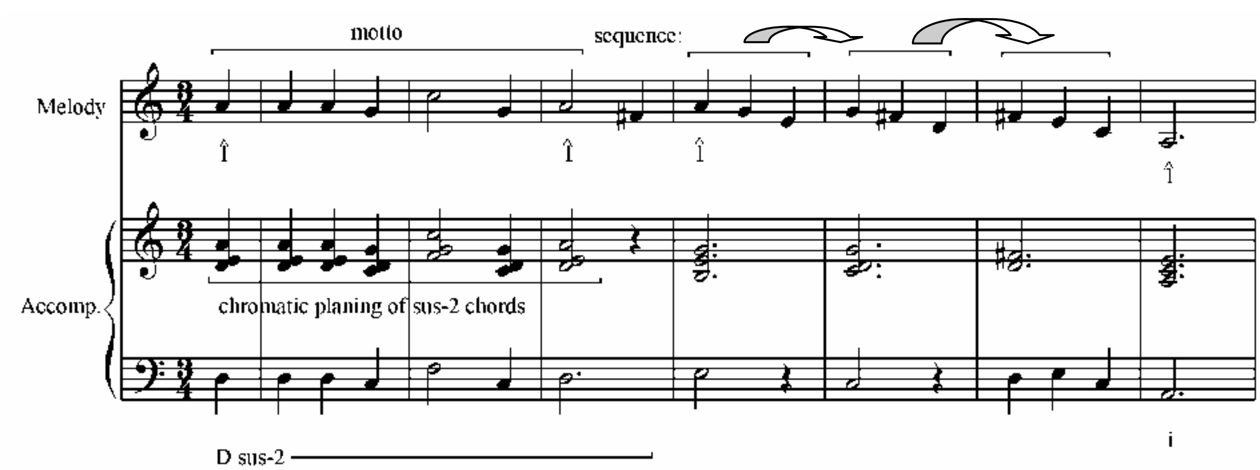
Example 4.24. Inversional relationship between Lydian and Dorian.



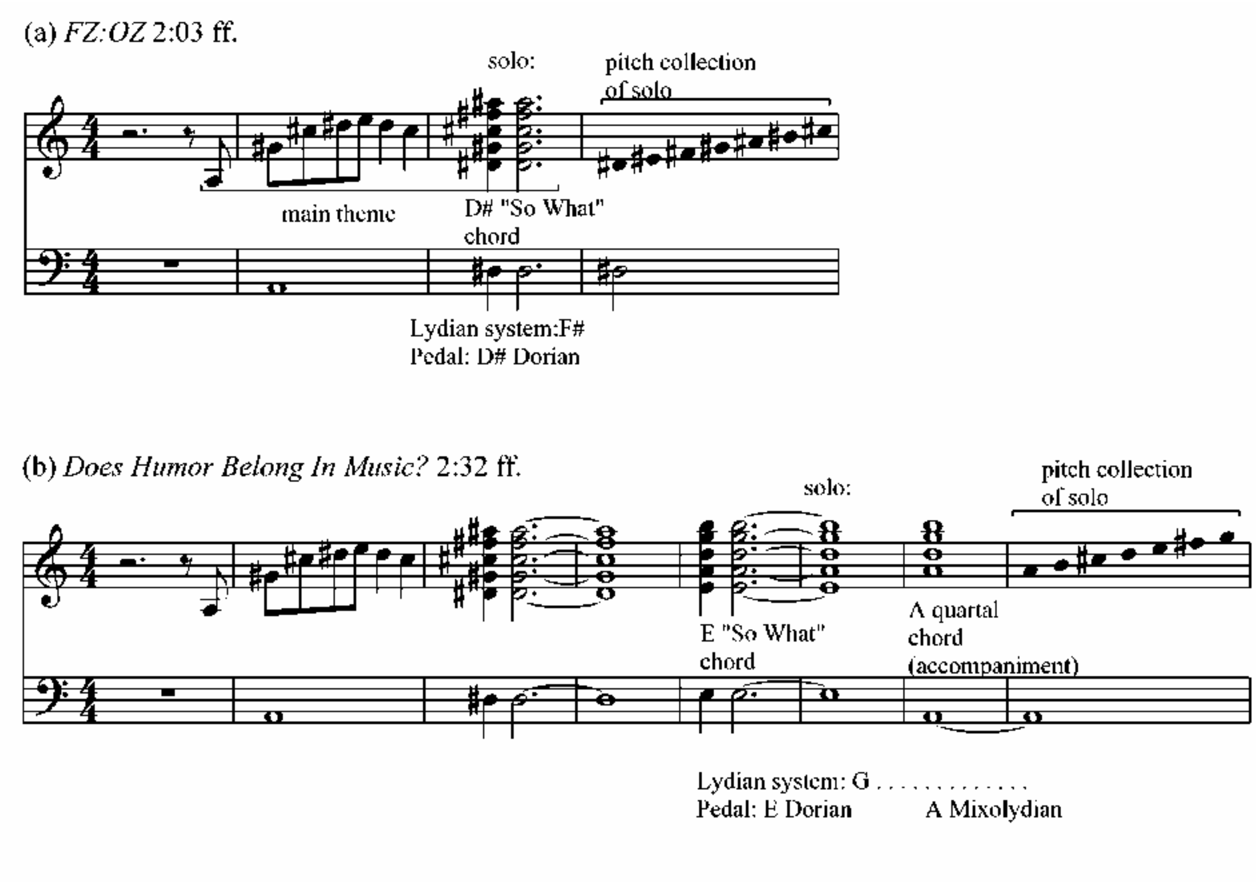
Example 4.25. Dorian (Mode IV): basic pitch structures.



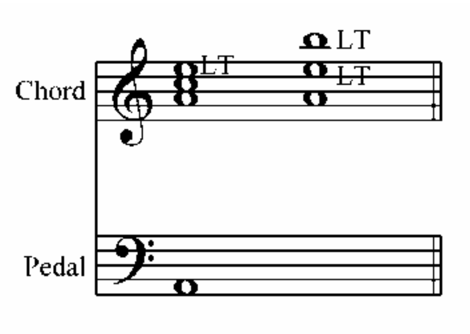
Example 4.26. “The Idiot Bastard Son”: opening measures.



Example 4.27. "Zoot Allures":
transitions to solo circa (a) 1975–1976 and (b) 1981–1988.



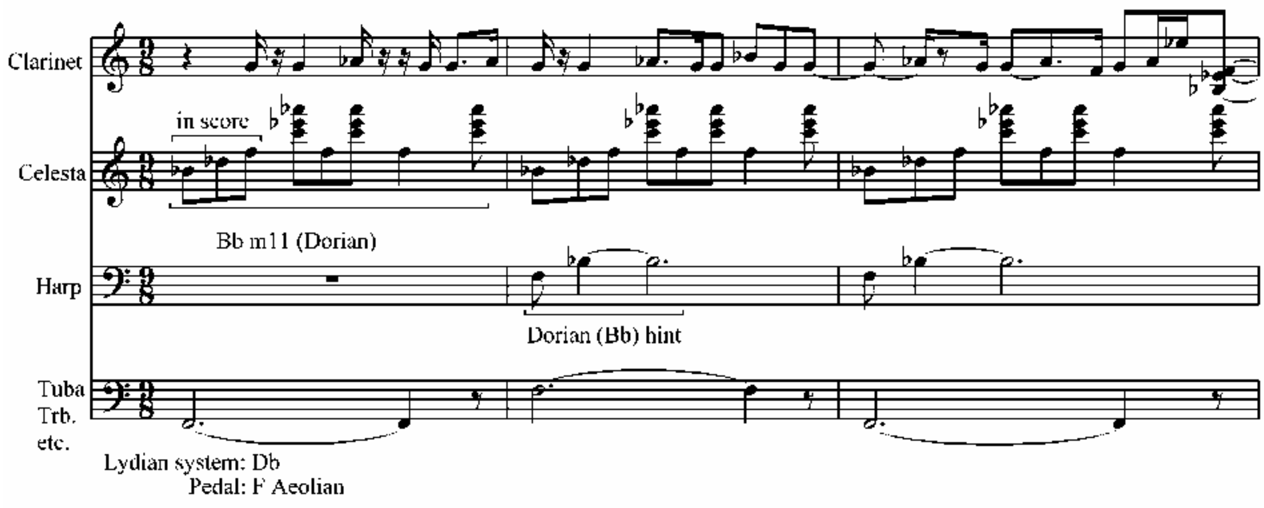
Example 4.28. Potential triad and sus-2 chord of Aeolian (Mode V).



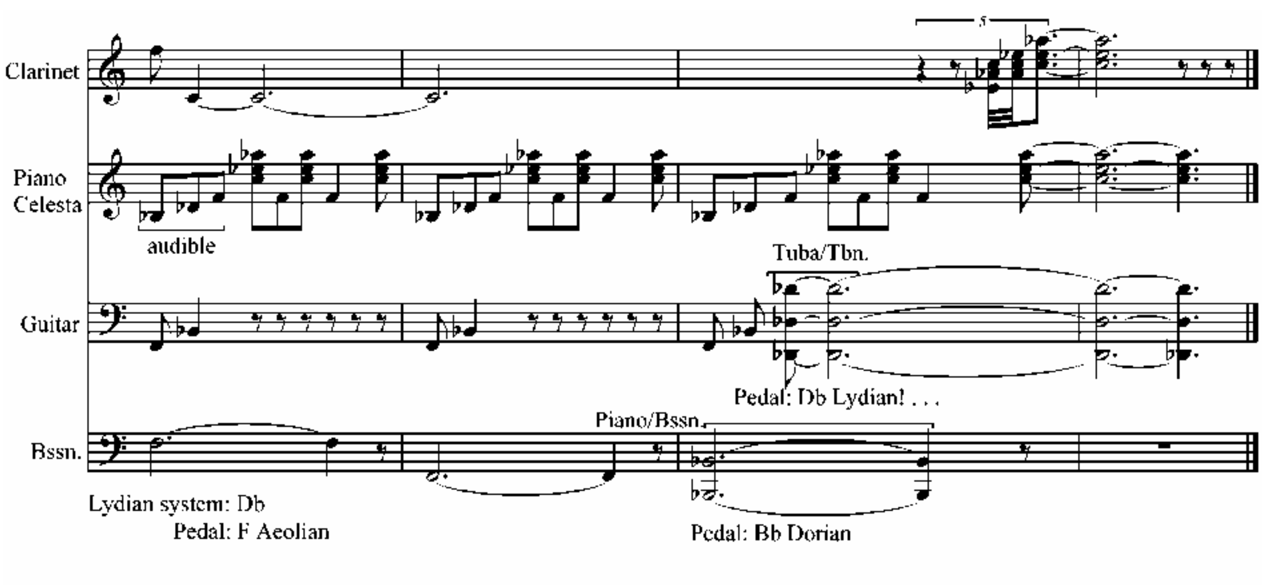
Example 4.29. Traditional ranking of modes: brightest to darkest.

		Significant identifying tones
Brightest	Lydian	A4
↓	Ionian	P4, major 7
	Mixolydian	m7, M3
	Dorian	m3, M6
	Aeolian	m6, M2
	Phrygian	m2, P5
Darkest	Locrian	d5

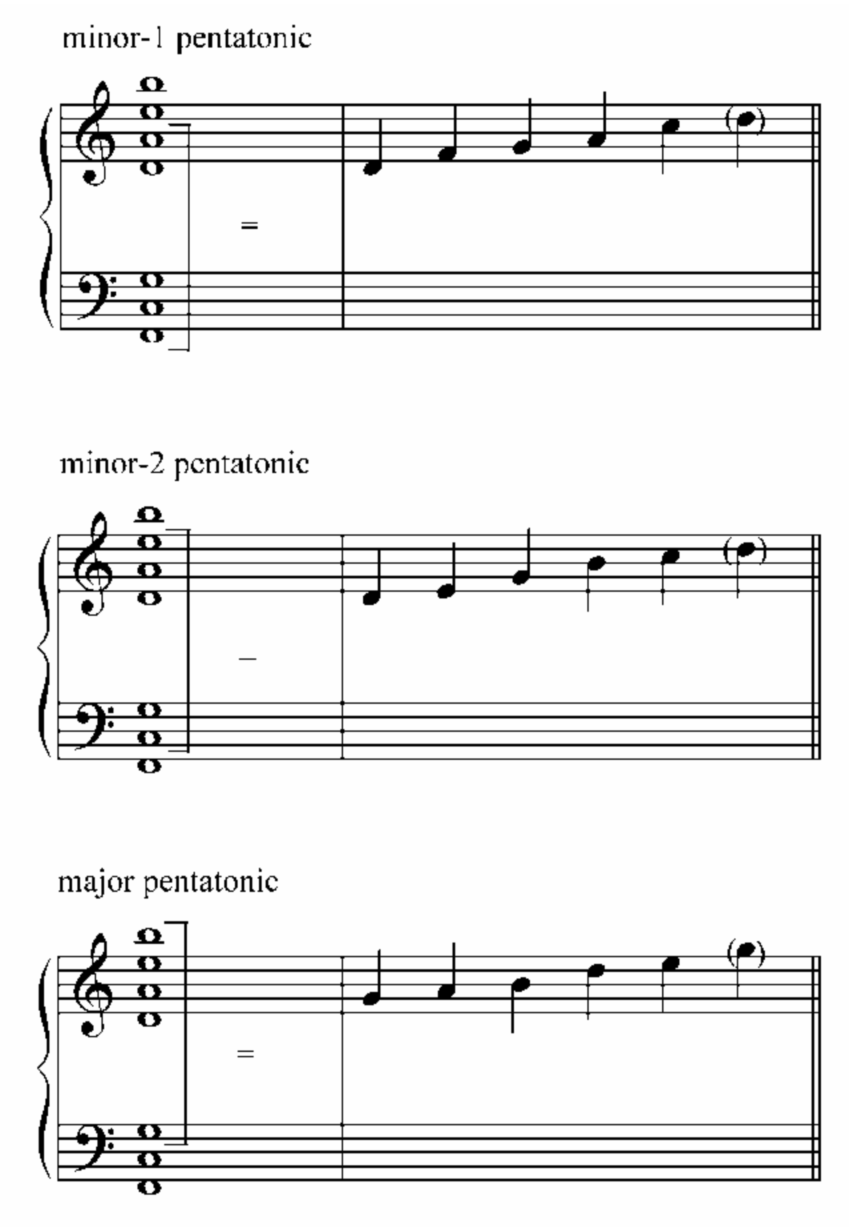
Example 4.30. “Outrage at Valdez” mm. 2–4.



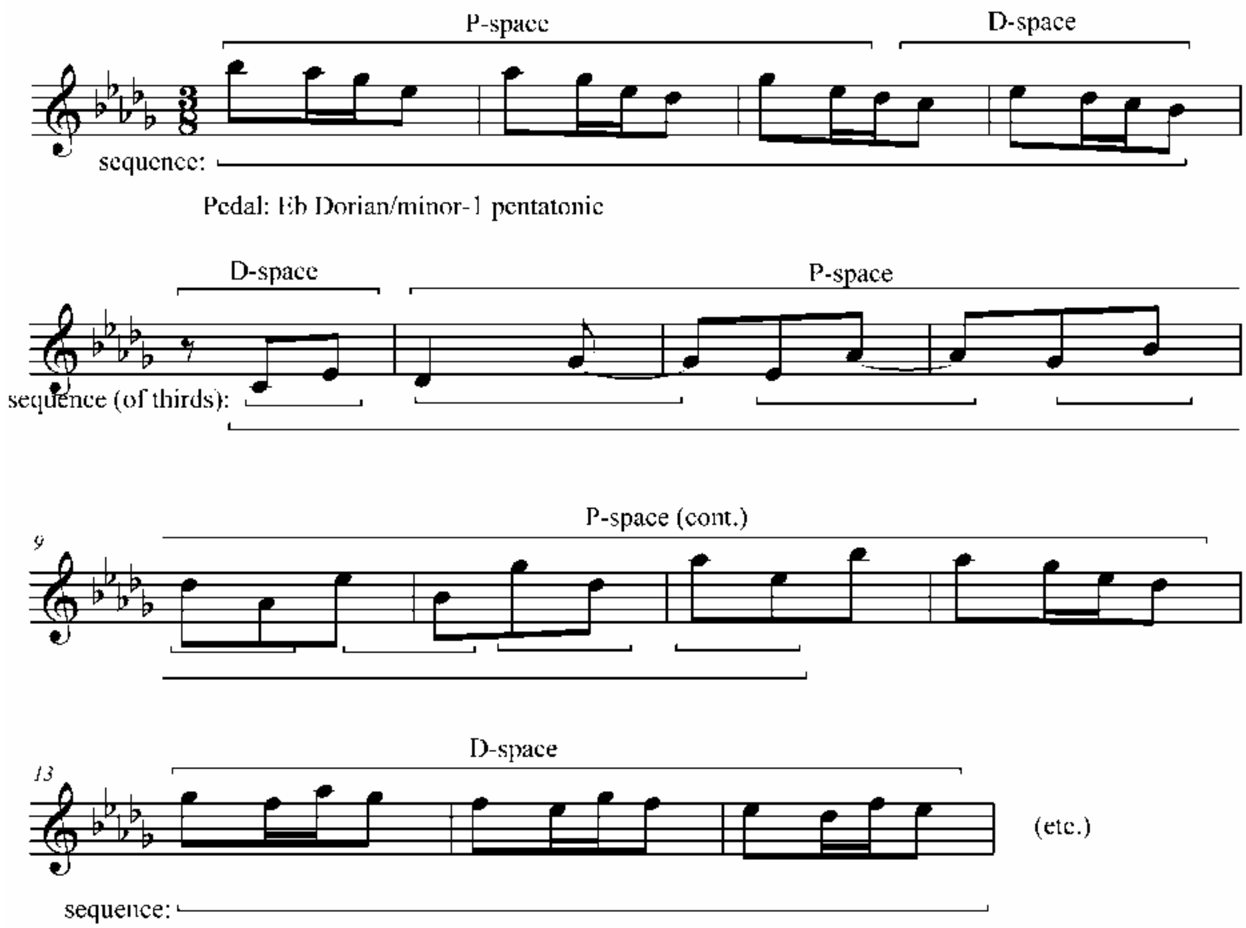
Example 4.31. “Outrage at Valdez” mm. 57–end.



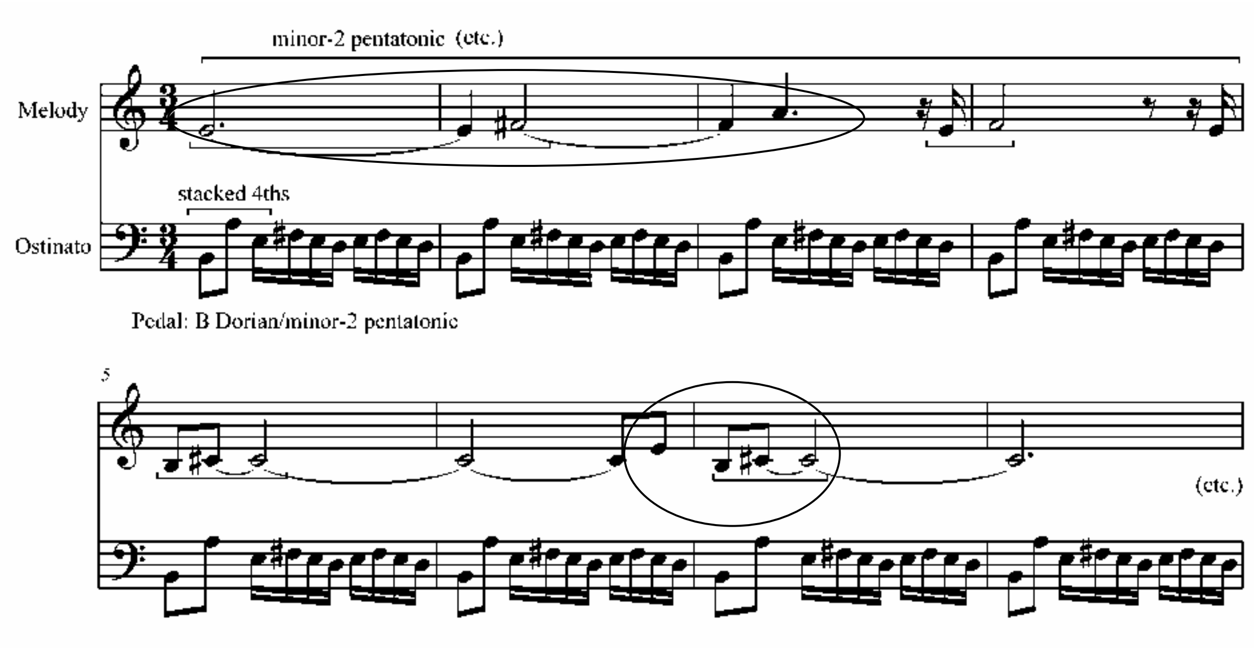
Example 4.32. Pentatonic scales within the Lydian system.



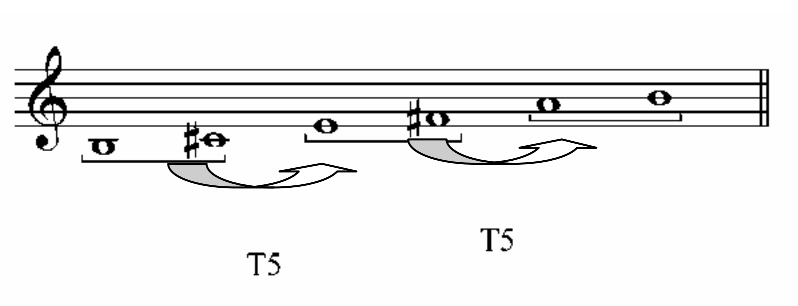
Example 4.33. “King Kong” main theme:
interaction between minor-1 pentatonic (P-space) and Dorian (D-space).



Example 4.34. “Run Home Slow” main theme: minor-2 pentatonic.



Example 4.35. T5-related dyads of minor-2 pentatonic.



Example 4.36. “G-Spot Tornado” main theme: minor-2 pentatonic.

Example 4.37. "G-Spot Tornado": excerpts from B section.

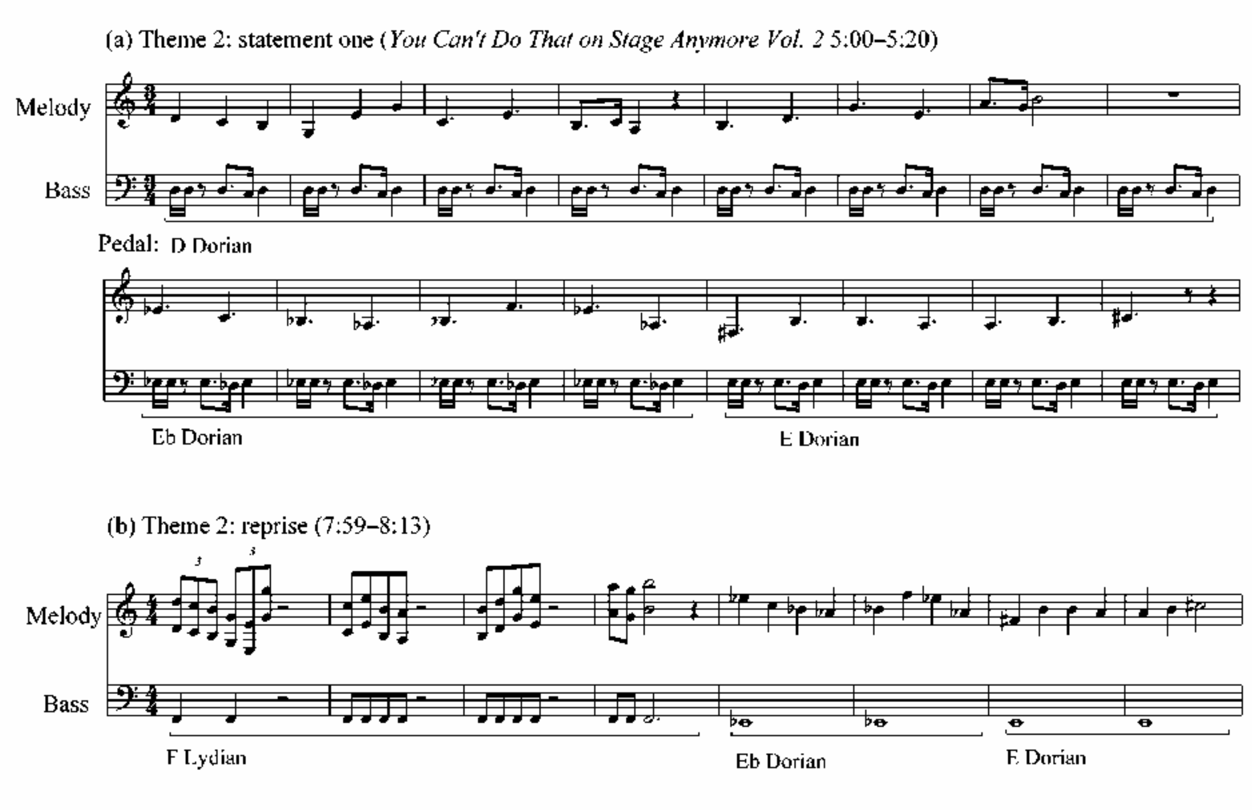
Example 4.38. "Dupree's Paradise" main theme: major pentatonic.

Example 4.39. “Montana,” primary motive: pedal substitution.

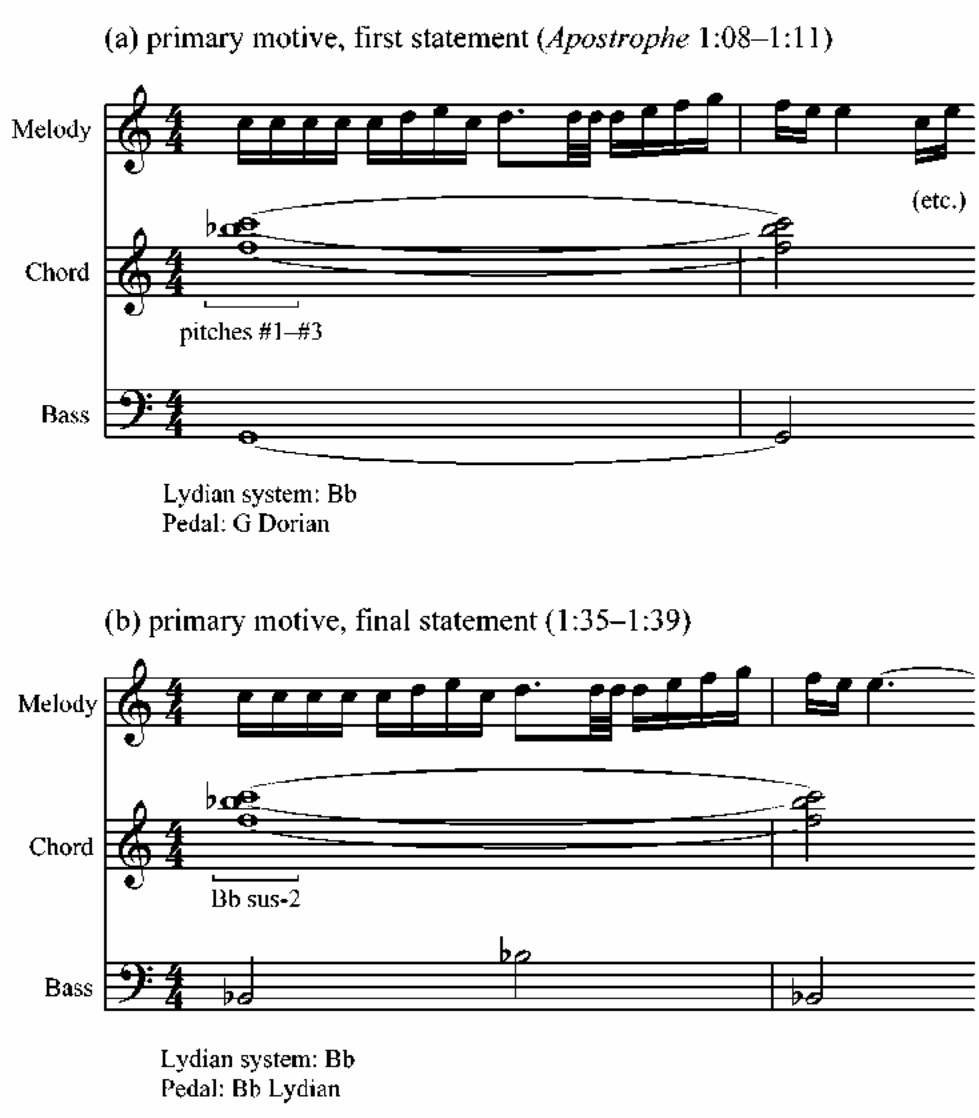
Example 4.40. Ionian/Lydian pedal substitution in (a) "Uncle Meat" and (b) RDNZL

Example 4.41. “Inca Roads” Theme 1.

Example 4.42. "RDNZL":
Dorian/Lydian pedal substitution.

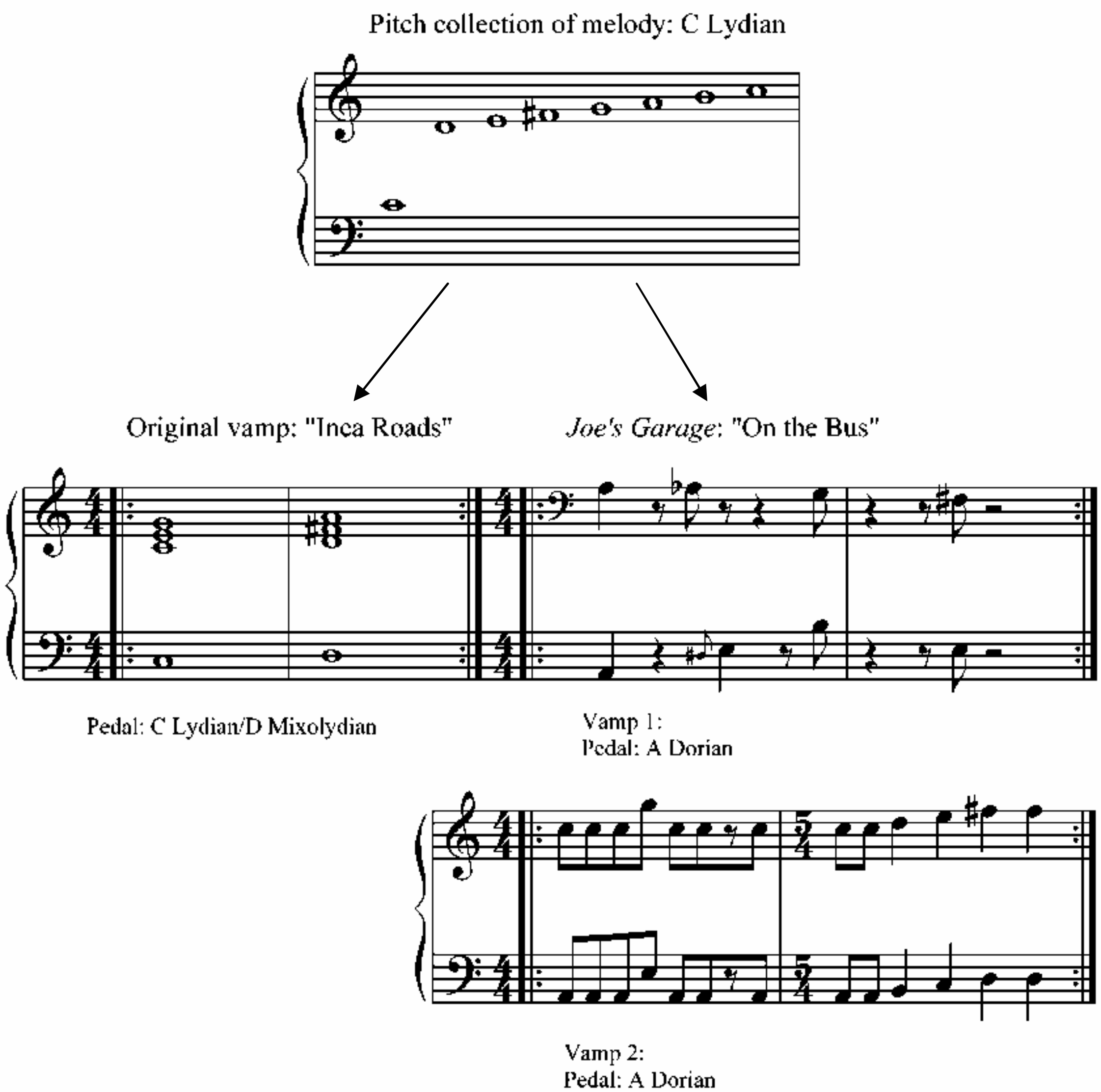


Example 4.43. “Rollo/St. Alphonzo’s Pancake Breakfast”:
Dorian/Lydian pedal substitution.

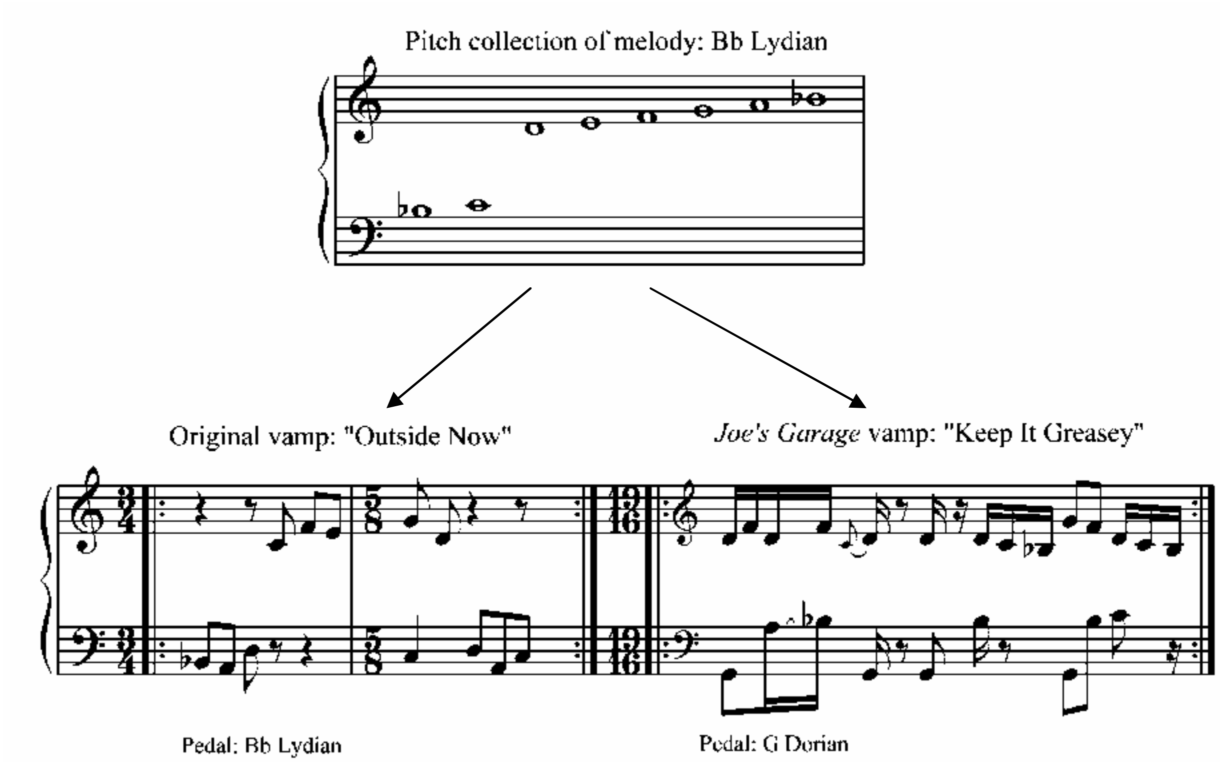


Example 4.44. Pedal substitution applied to guitar solos of *Joe's Garage*.

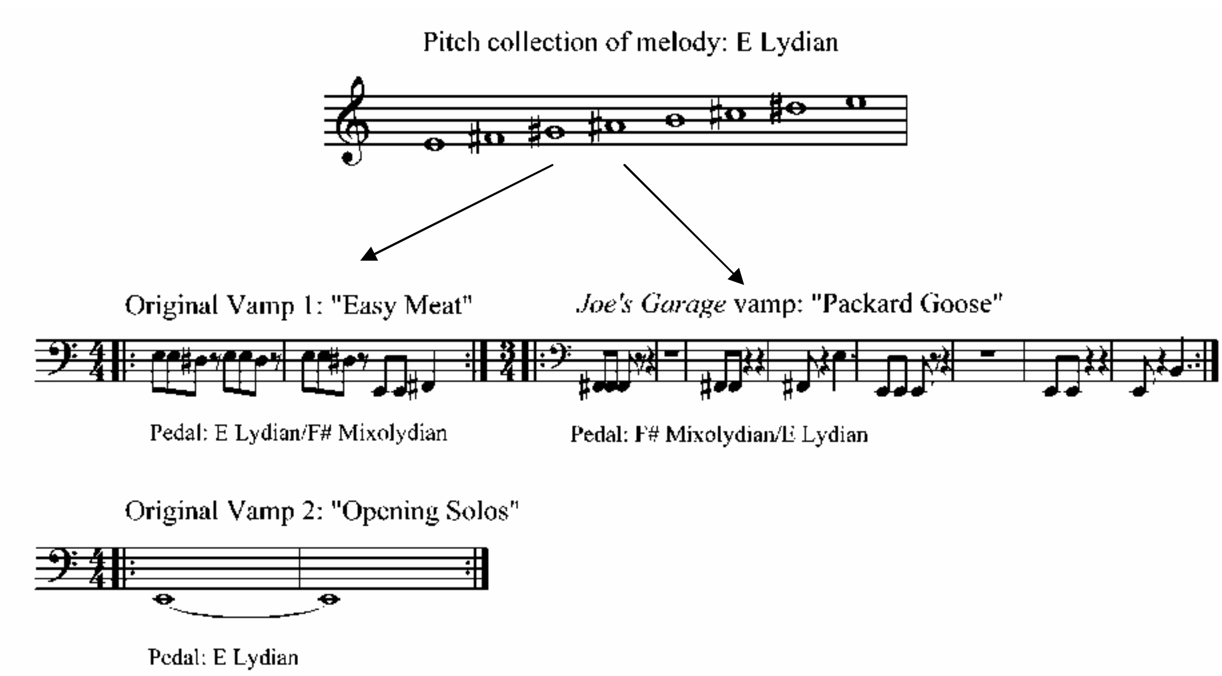
(a) "On the Bus"



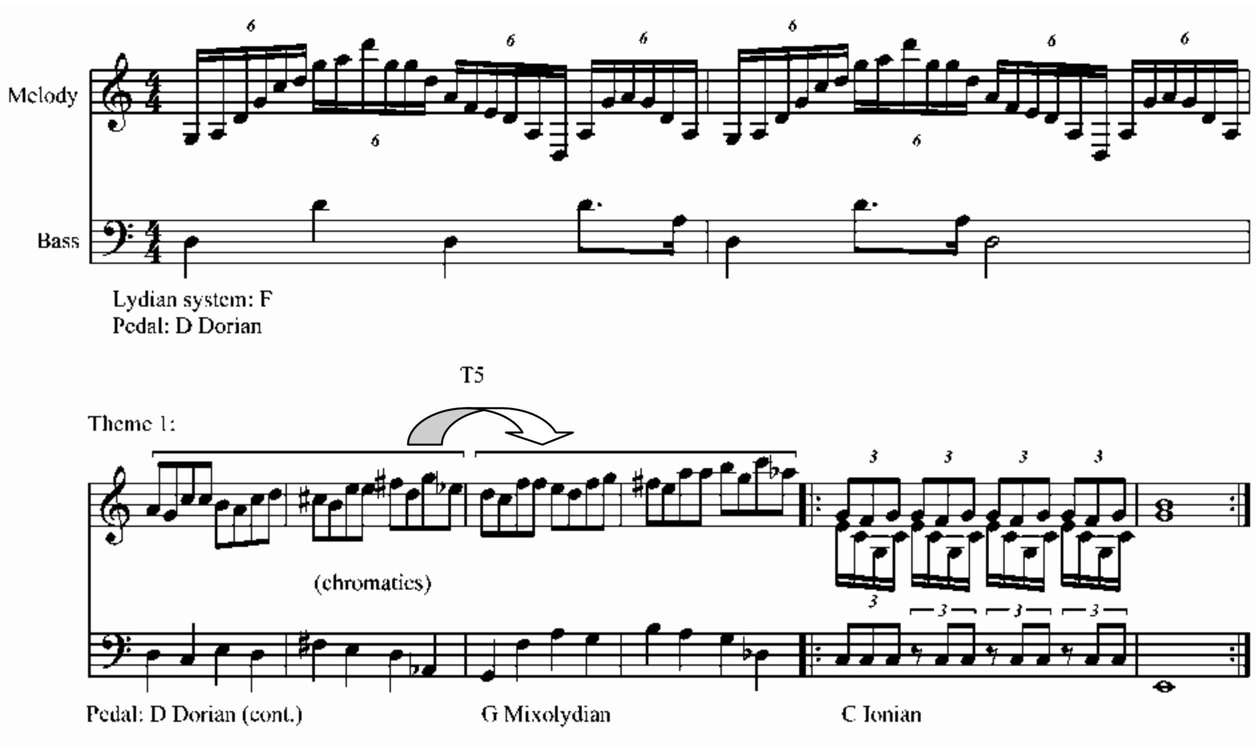
(b) “Keep it Greasey”



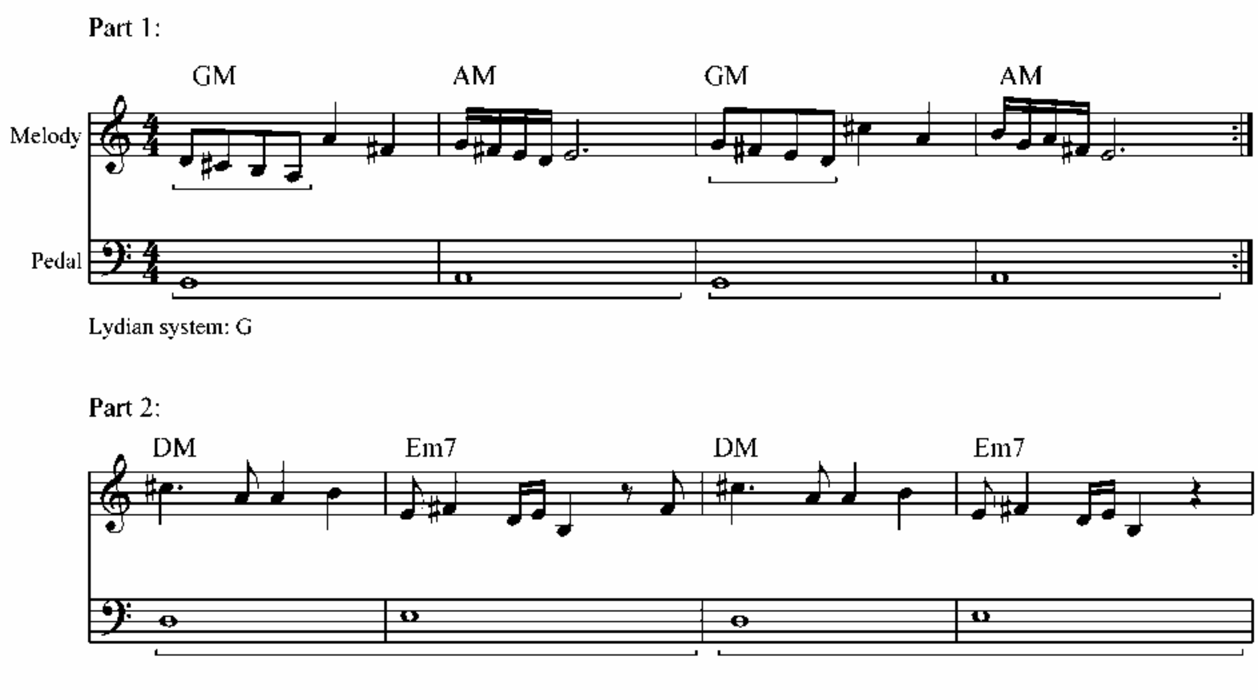
(c) “Packard Goose”



Example 4.45. “RDNZL”: opening.



Example 4.46. “Dog Breath” main theme.

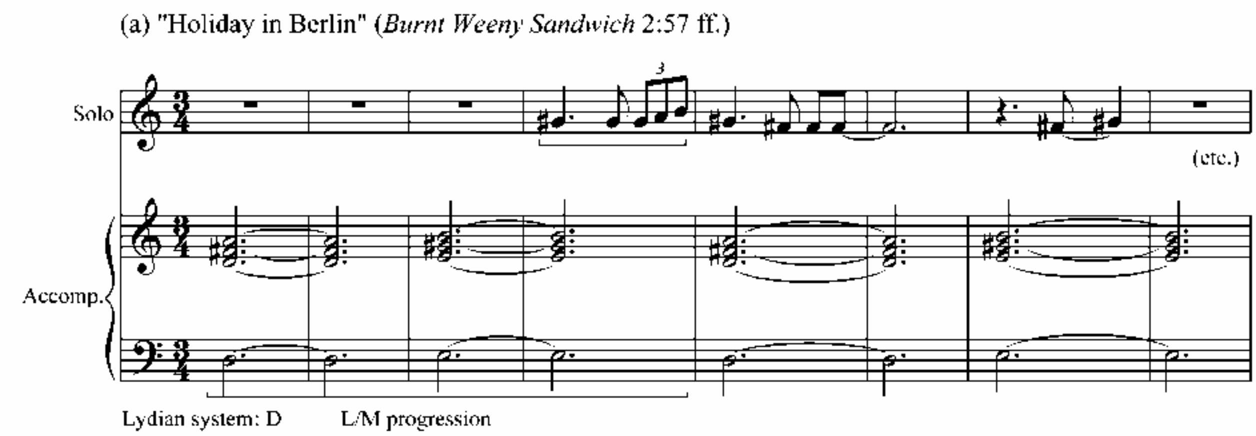


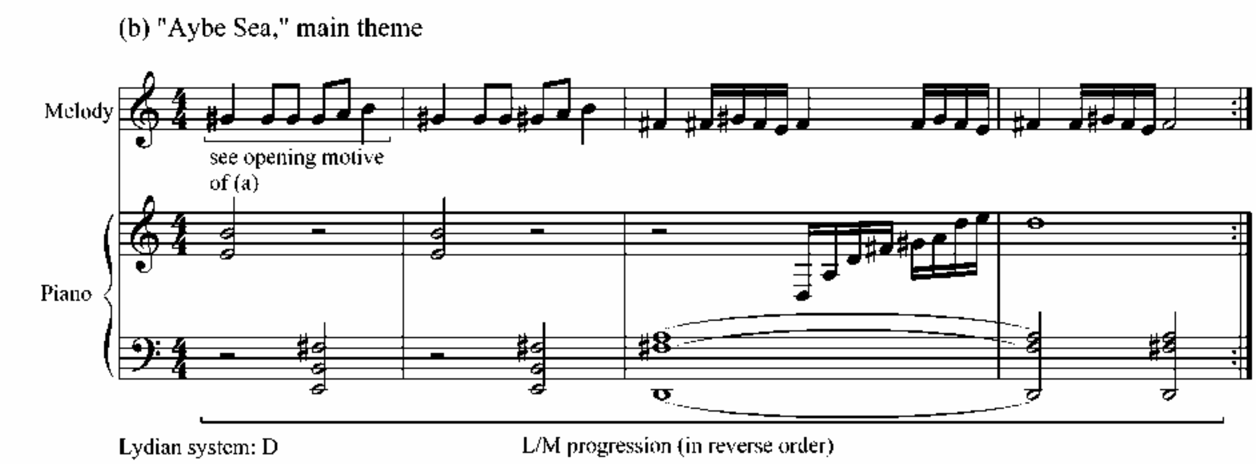
Example 4.47. “The Dog Breath Variations” (ACE):
isomelic variations of main theme.

(a) mm. 5–12, introductory thematic statement

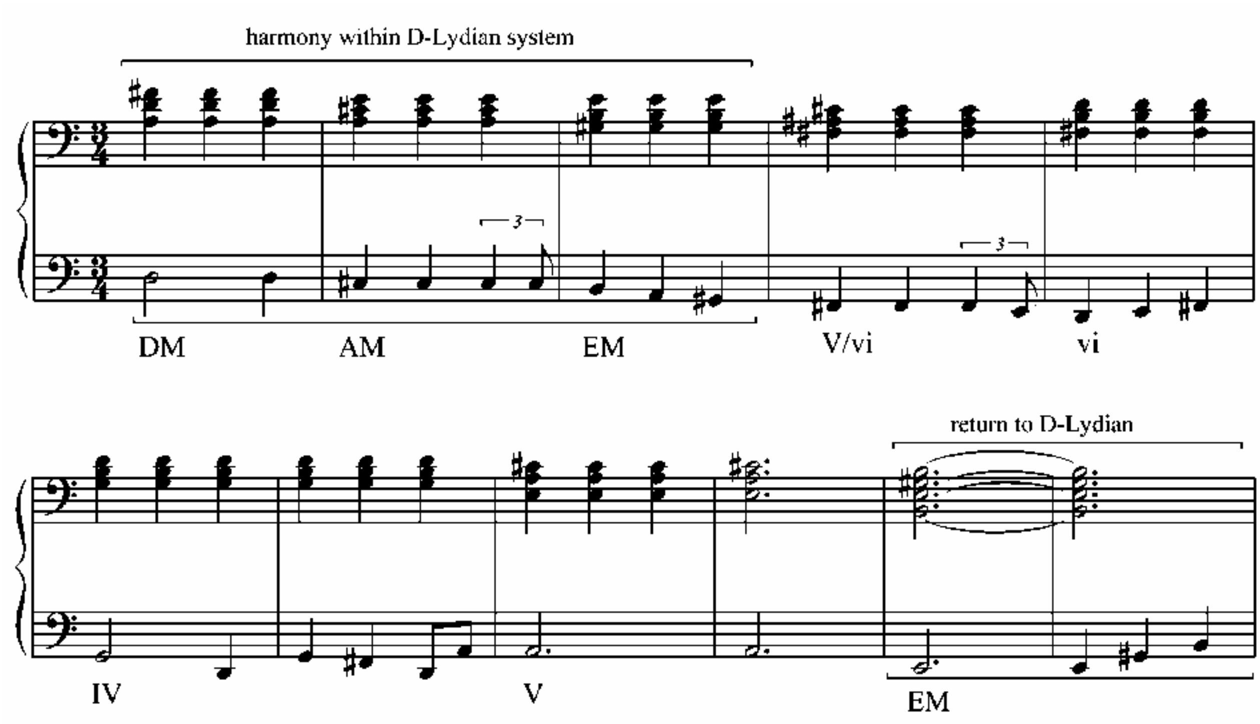
(b) mm. 13–16, main theme

Example 4.48.
The L/M progression in (a) “Holiday in Berlin” and (b) “Aybe Sea.”

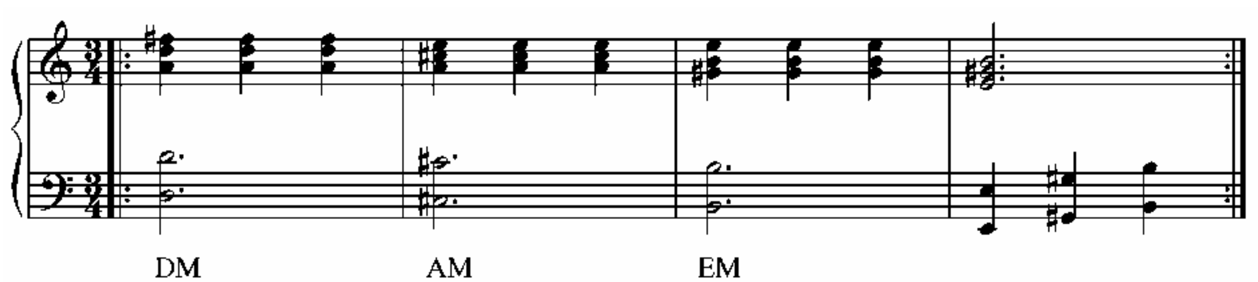




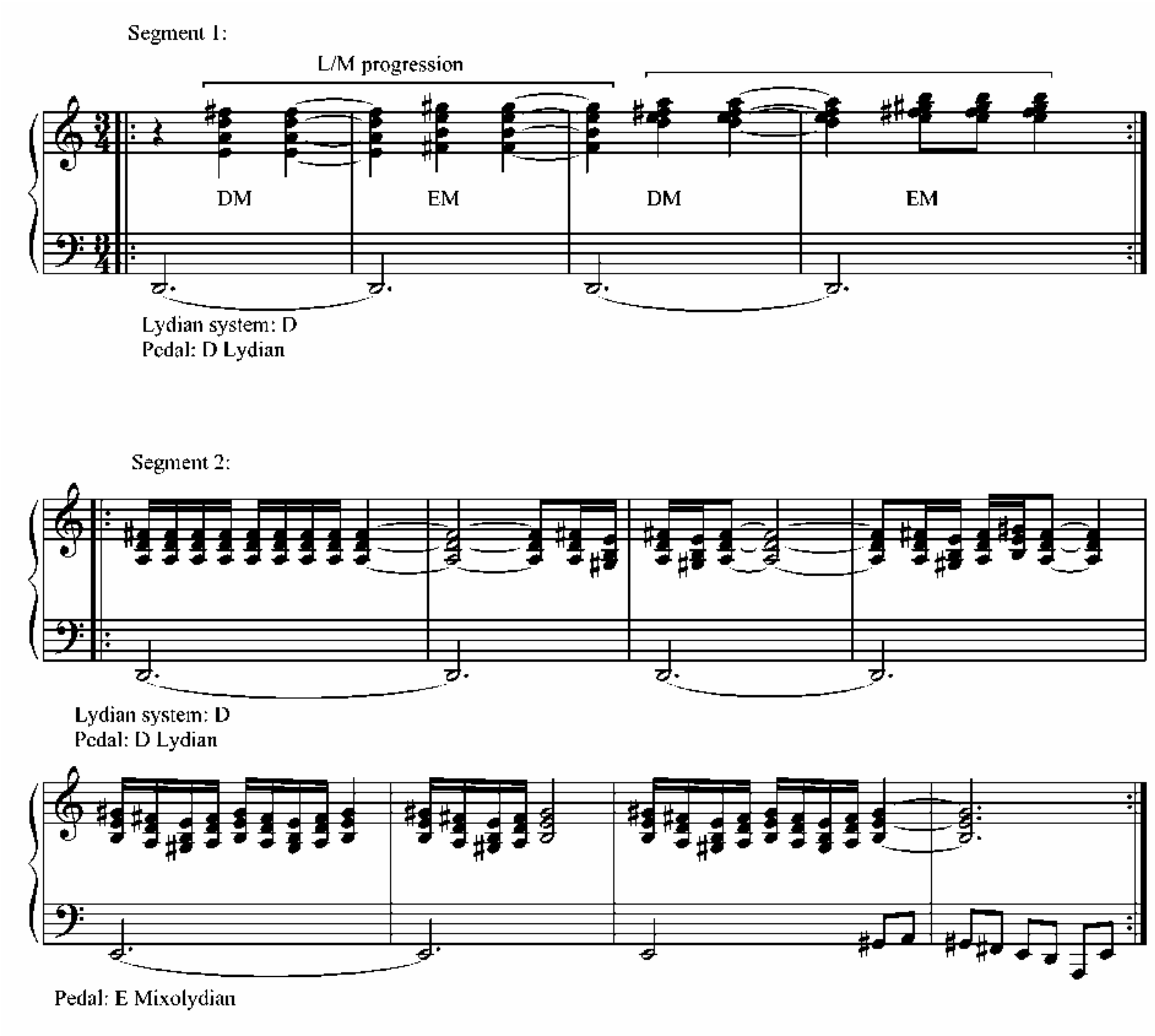
Example 4.49. "Strictly Genteel":
progression accompanying main theme.



Example 4.50. Coda of "Strictly Genteel."

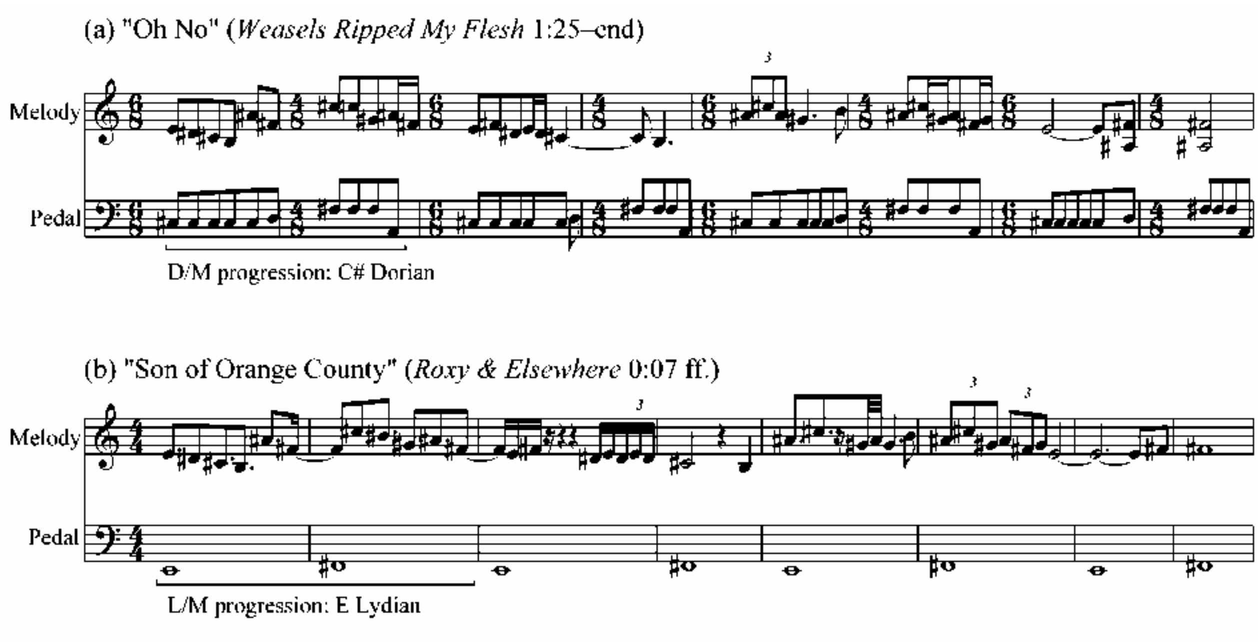


Example 4.51. "Strictly Genteel" (*London Symphony Orchestra* 4:00–4:42): segments utilizing the L/M progression.

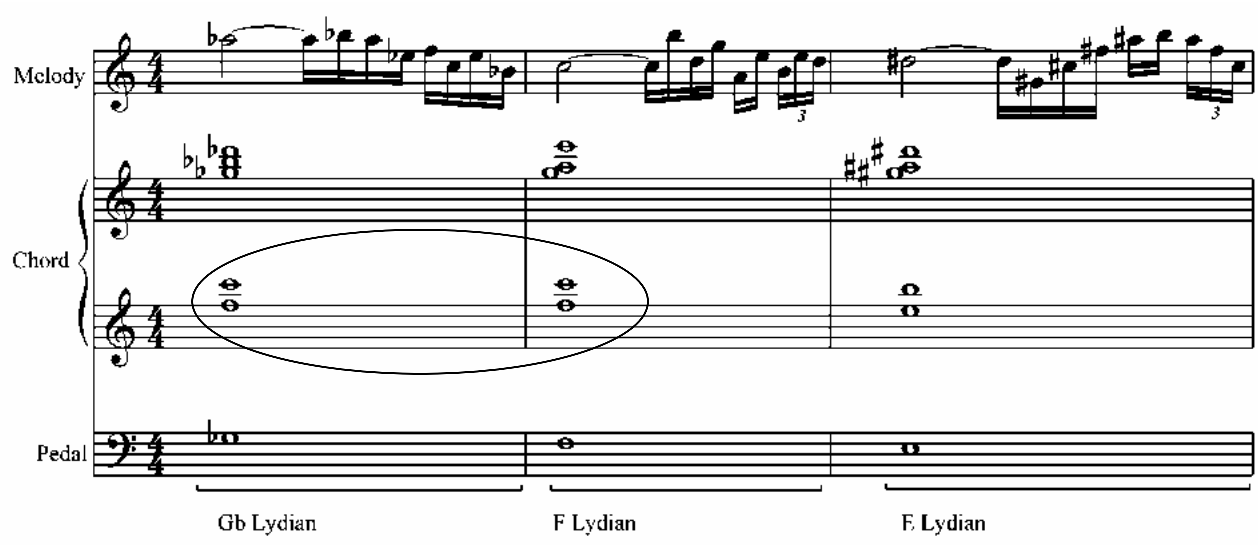


Example 4.52. “Oh No” main theme: the D/M progression.

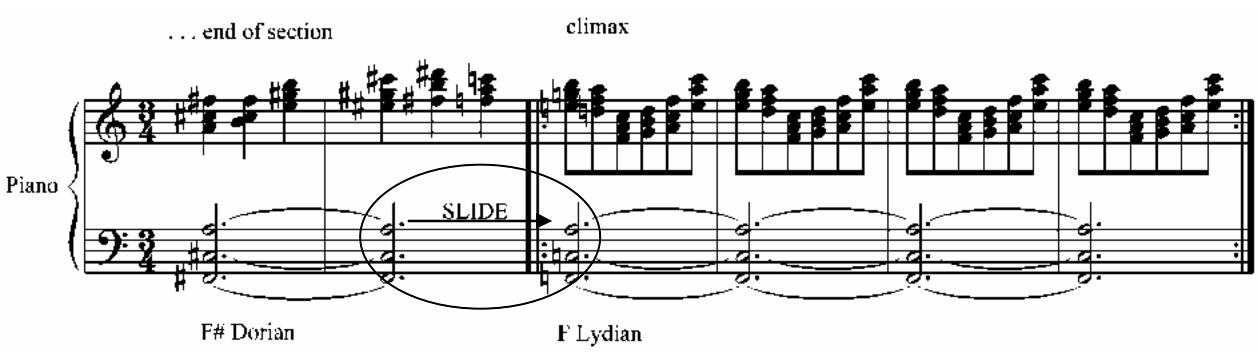
Example 4.53. Dorian/Lydian pedal substitution between L/M and D/M progressions.



Example 4.54. "Drowning Witch"
(*Ship Arriving Too Late to Save a Drowning Witch* 1:57–2:03): pedal progression by semitone.



Example 4.55. "Drowning Witch" mm. 84–59
(*Ship Arriving* . . . 11:22–11:38): SLIDE transformation between semitone-related pedals.

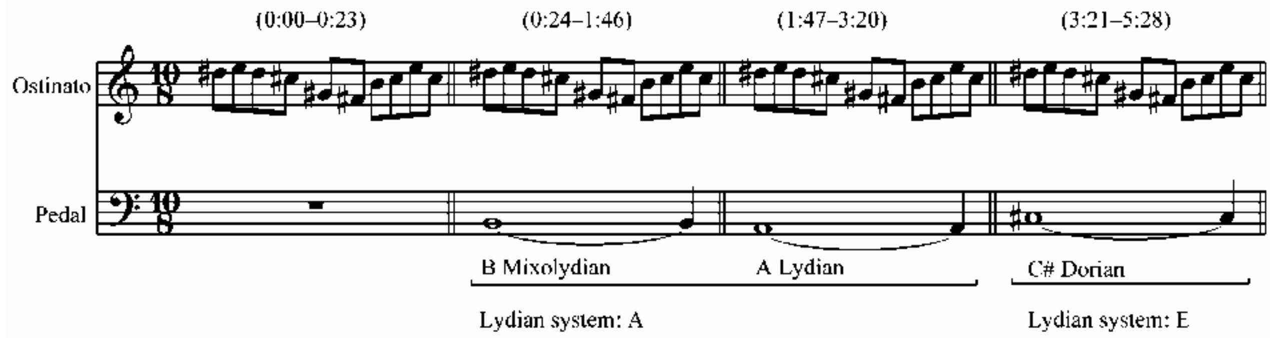


Example 4.56. Common-tone relationship between Lydian systems of “Black Napkins.”

	A#		G#	major pentatonic
	D#		C#	major pentatonic
	G#	minor-1 pentatonic	F#	major pentatonic
	C#	minor-1 pentatonic	B	major pentatonic
	F#	minor-1 pentatonic	E	major pentatonic
	B	minor-1 pentatonic	A	
	E	minor-1 pentatonic	D	
Chord:	C#m7		DM7	
Lyd system:	E		D	

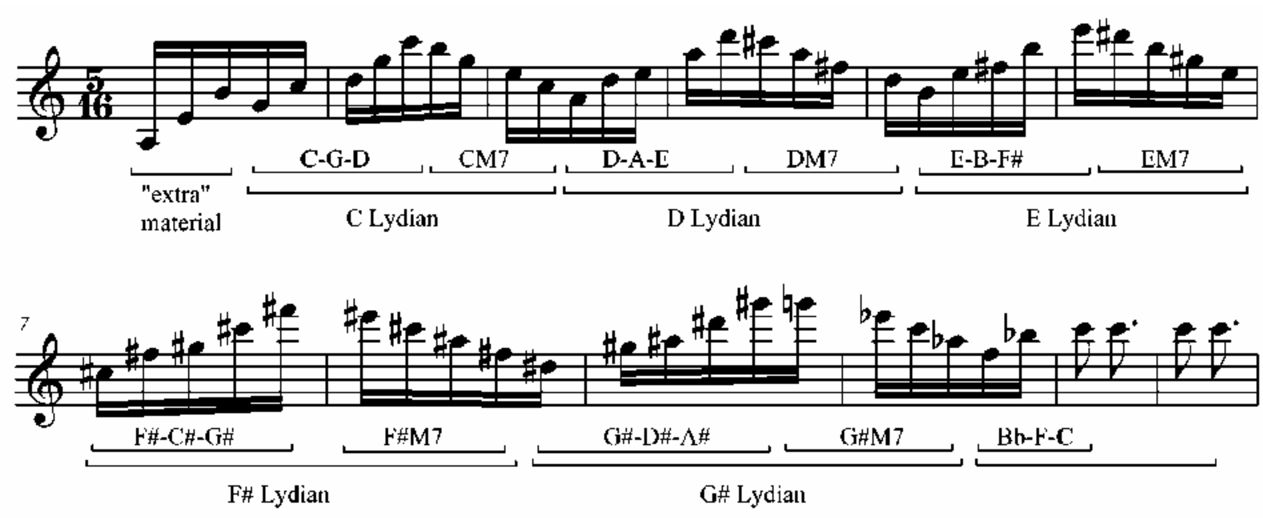
Example 4.57. “Black Napkins” main theme.

Example 4.58. “The Deathless Horsie”:
summary of pitch materials (timings: *Shut Up ‘n Play Yer Guitar Some More*).



Example 4.59. “Duke of Prunes” main theme.

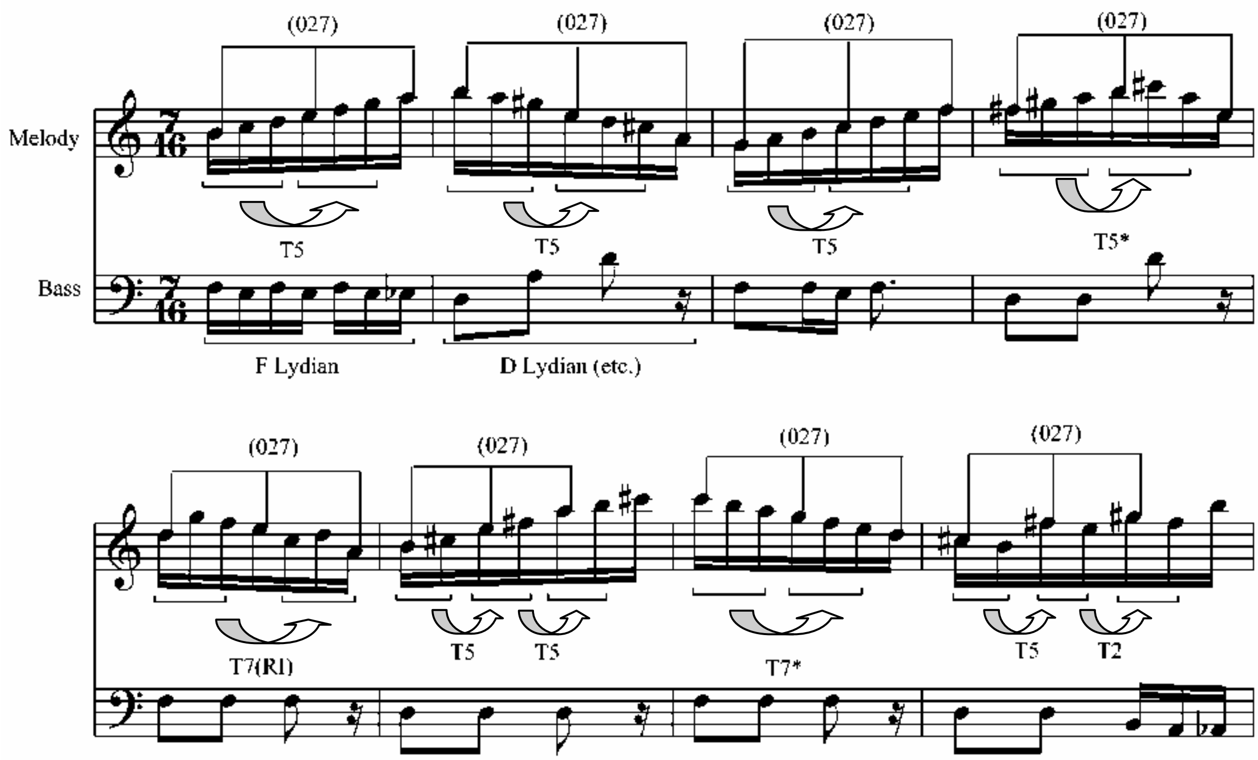
Example 4.60. “Echidna’s Arf (Of You)” (*Roxy & Elsewhere* 3:23–3:31).



Example 4.61. Interlocking (027)s of Example 4.60.

C – G – D – A – E – B – F# – C# – G# – D# – Bb – F – **C**

Example 4.62. “Inca Roads” (*One Size Fits All* 6:04–6:11).

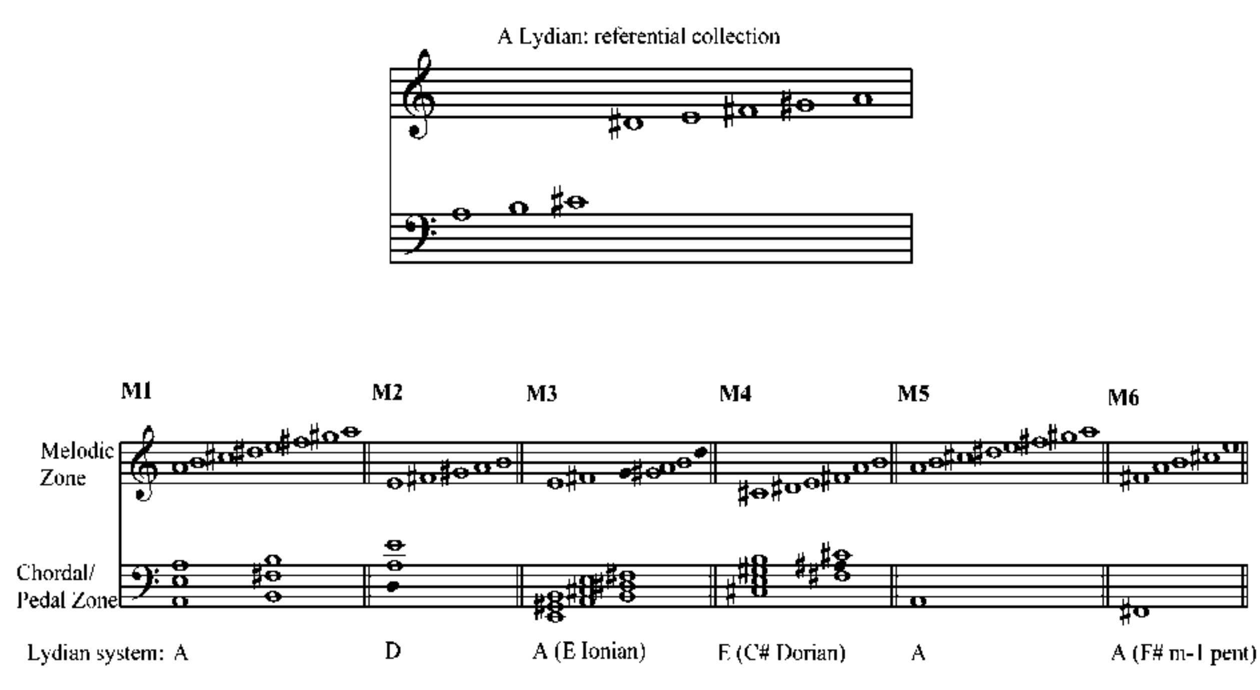


Example 4.63. Six thematic modules of "Andy."

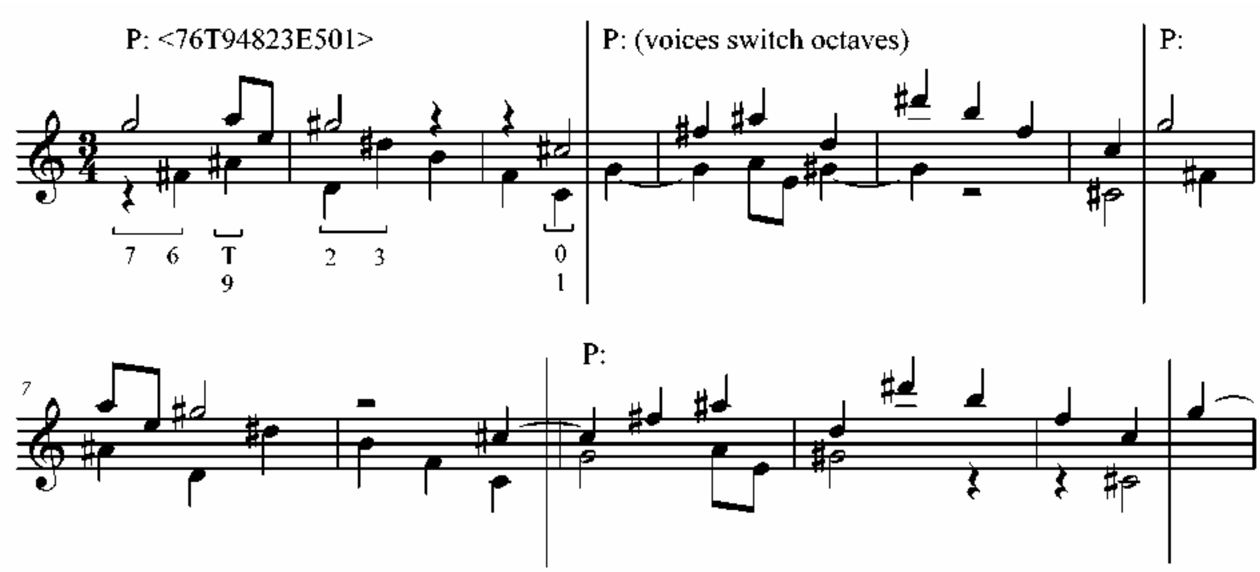
Example 4.64. Formal layout of thematic modules of “Andy.”

M1	**M2**	**M3**	**M1**	**M4**	**M2**	**M1**	**M5/solo**	**M2**	**M1**	**M4**	**M6**
0:00	0:34	0:58	1:17	1:50	2:07	2:23	2:32	3:46	4:03	4:20	5:08

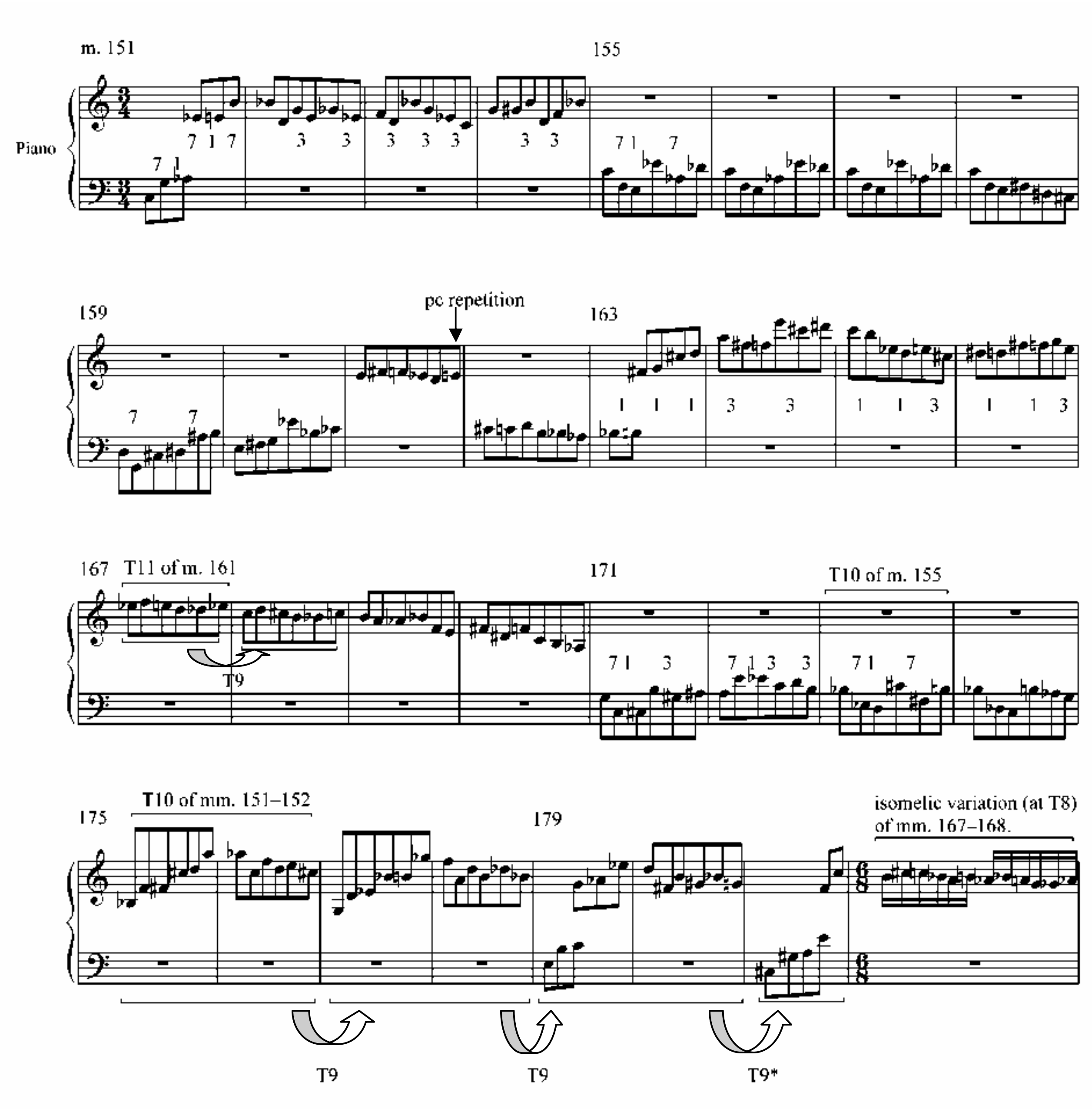
Example 4.65. Analytical reduction of “Andy.”



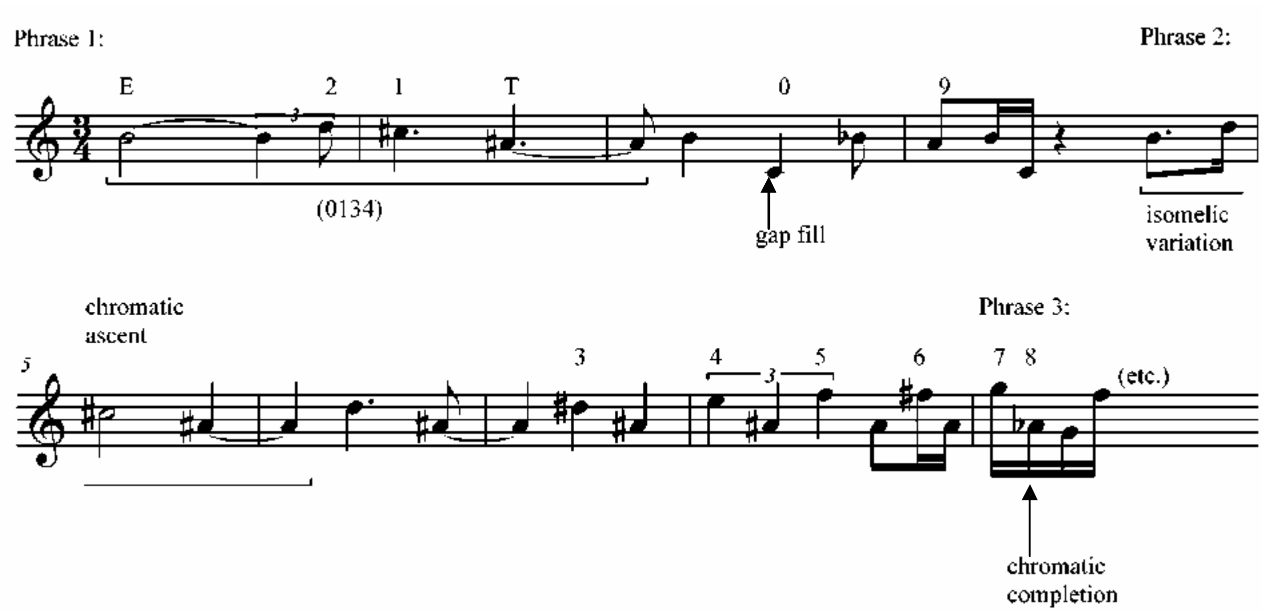
Example 5.1. “Waltz for Guitar” mm. 1–11.



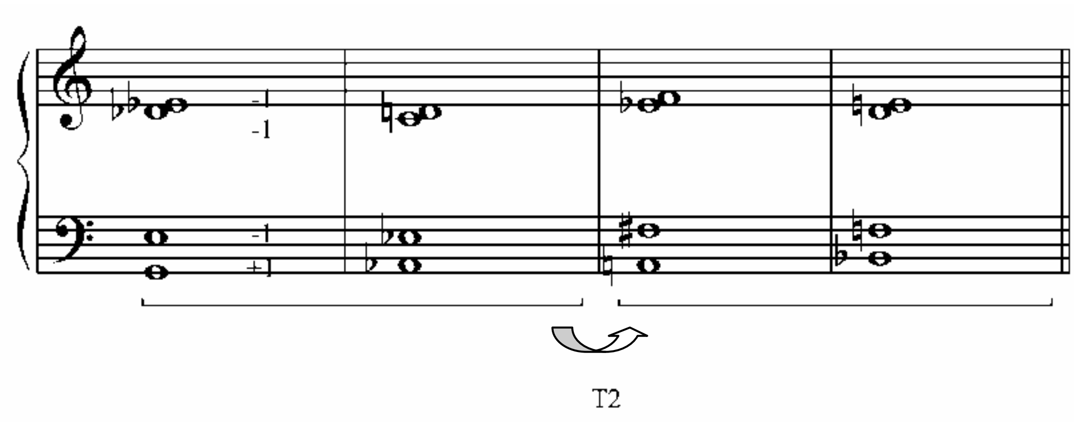
Example 5.2. “Dupree’s Paradise” (ACE), mm. 151–182 (*The Perfect Stranger* 3:24–4:07).



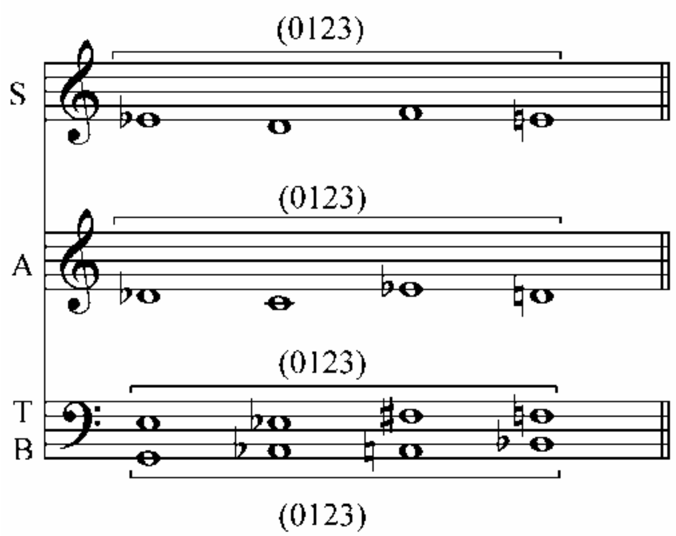
Example 5.3. “The Eric Dolphy Memorial Barbecue” mm. 1–9.



Example 5.4a. “Be-Bop Tango”: introductory chord progression.

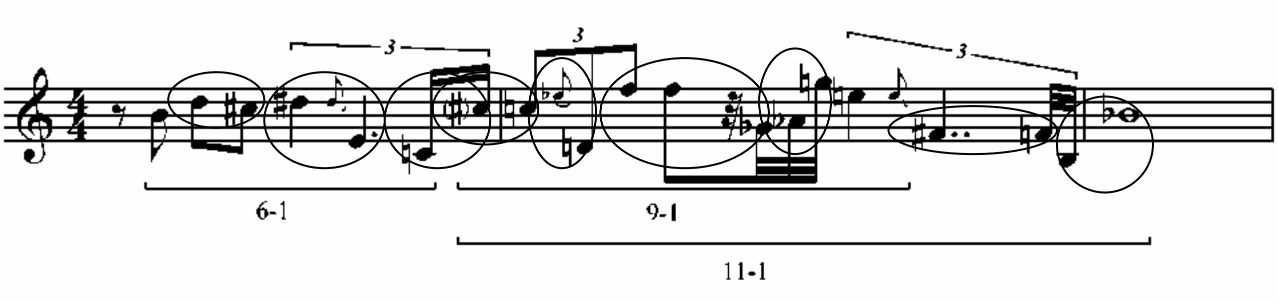


Example 5.4b. Chromatic tetrachords of opening progression.

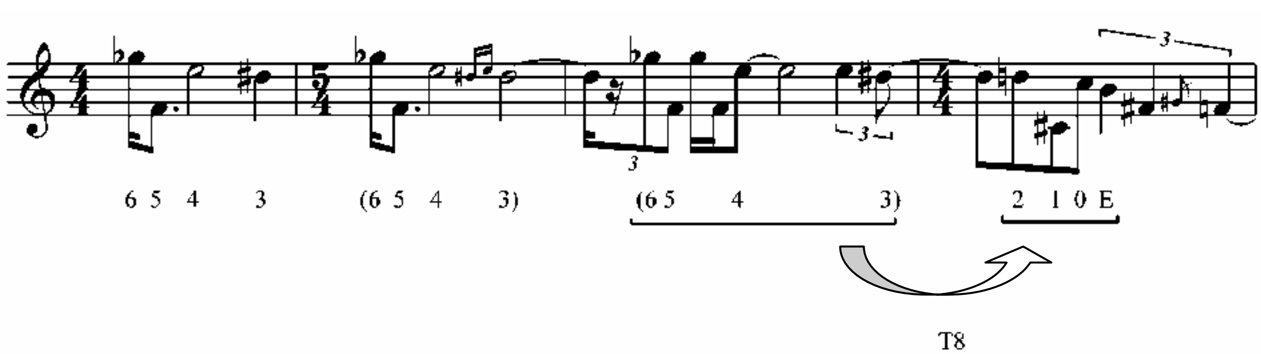


Example 5.5. Phrase endings of "Be-Bop Tango."

Example 5.6. “Be-Bop Tango” mm. 17–19 (*Roxy & Elsewhere* 2:10 ff.): ic 1 intervals circled.

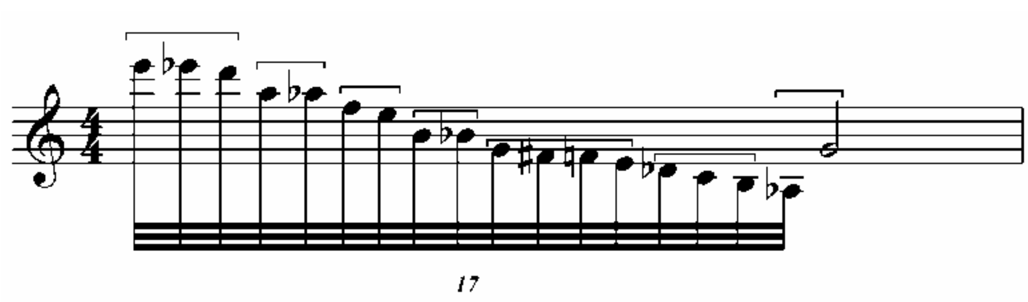


Example 5.7. Varèse, *Octandre* mm. 1–4.



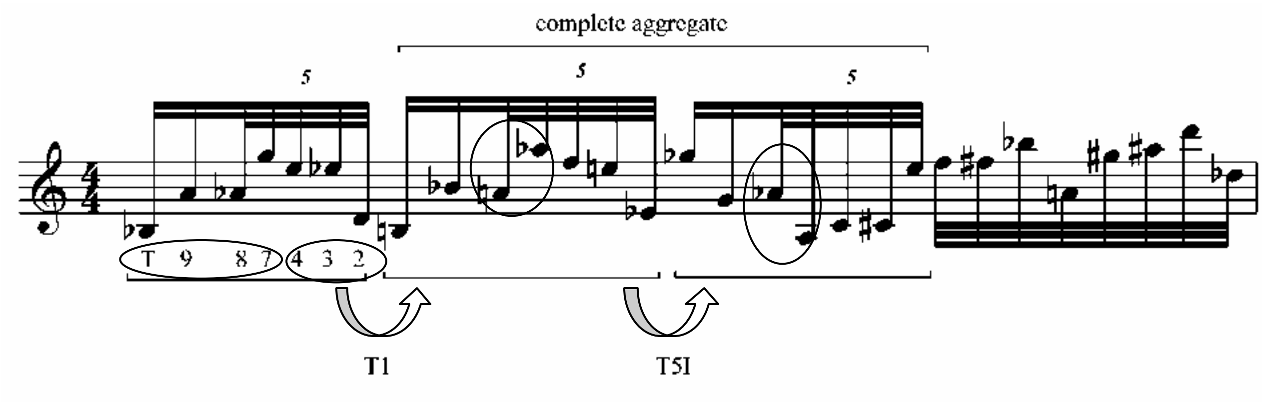
Example 5.8a. “Mo ‘N’ Herb’s Vacation I” mm. 45–48 (*London Symphony Orchestra* 3:00 ff.).

Example 5.8b. “Mo ‘N’ Herb’s Vacation I” m. 26 (1:46 ff.).

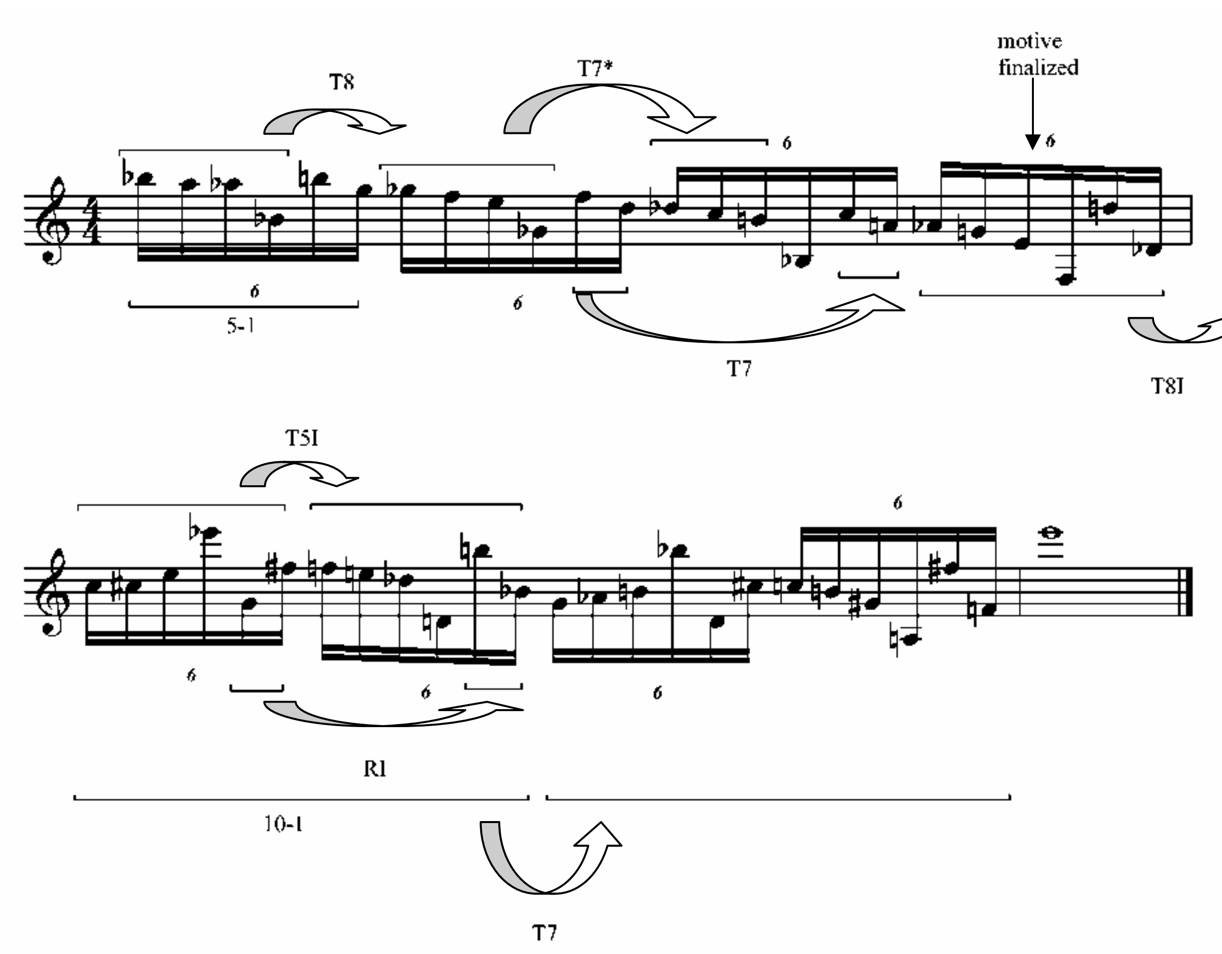


Example 5.9. “Pedro’s Dowry” mm. 59–63.

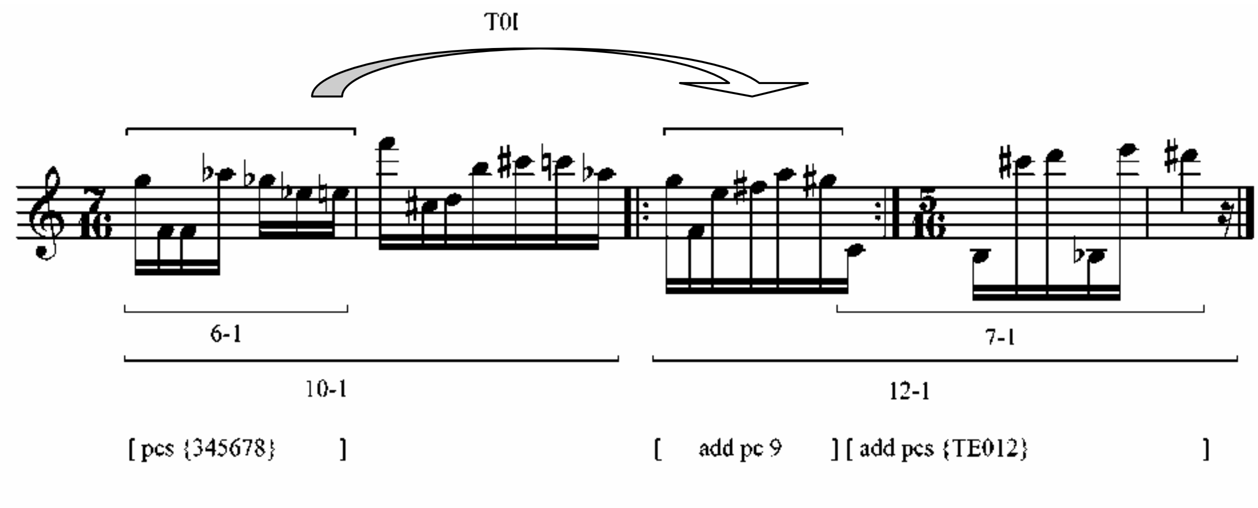
Example 5.10a. “Mo ‘N’ Herb’s Vacation I” m. 25.



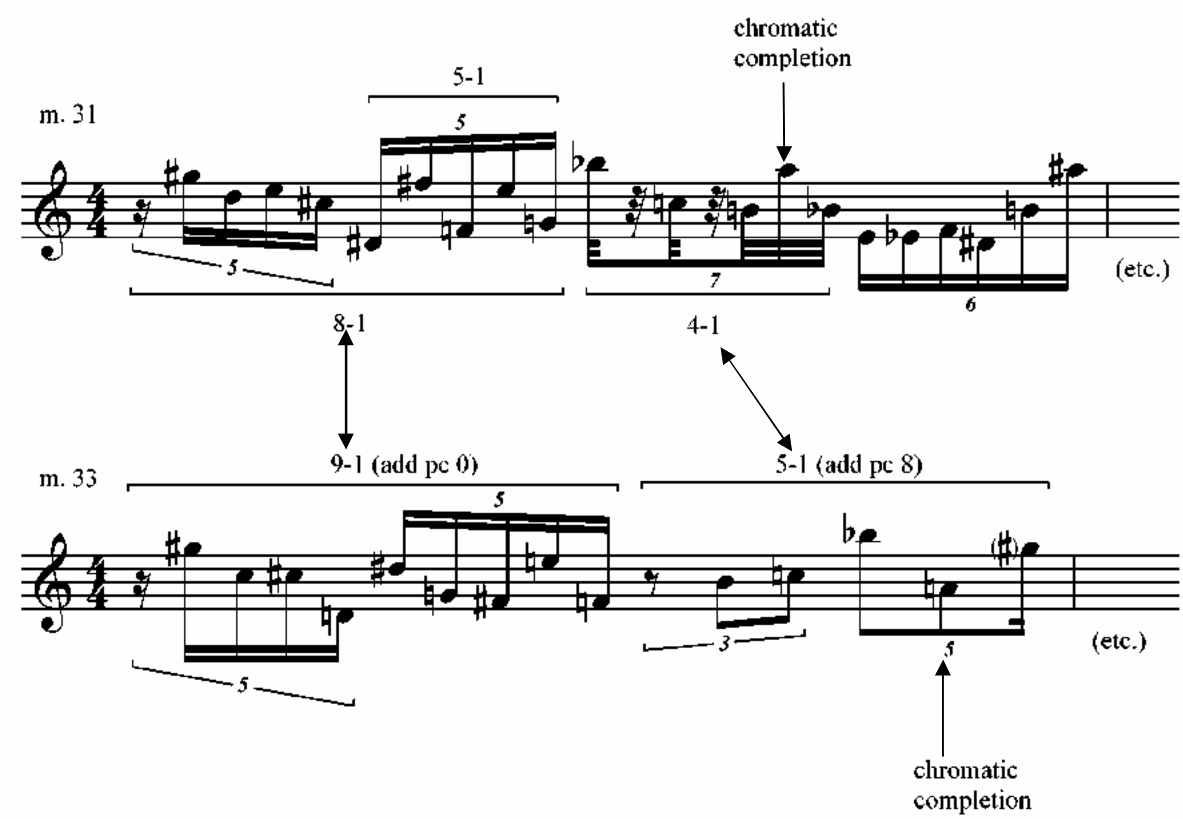
Example 5.10b. “Mo ‘N’ Herb’s Vacation” mm. 72–74 (4:31 ff.).



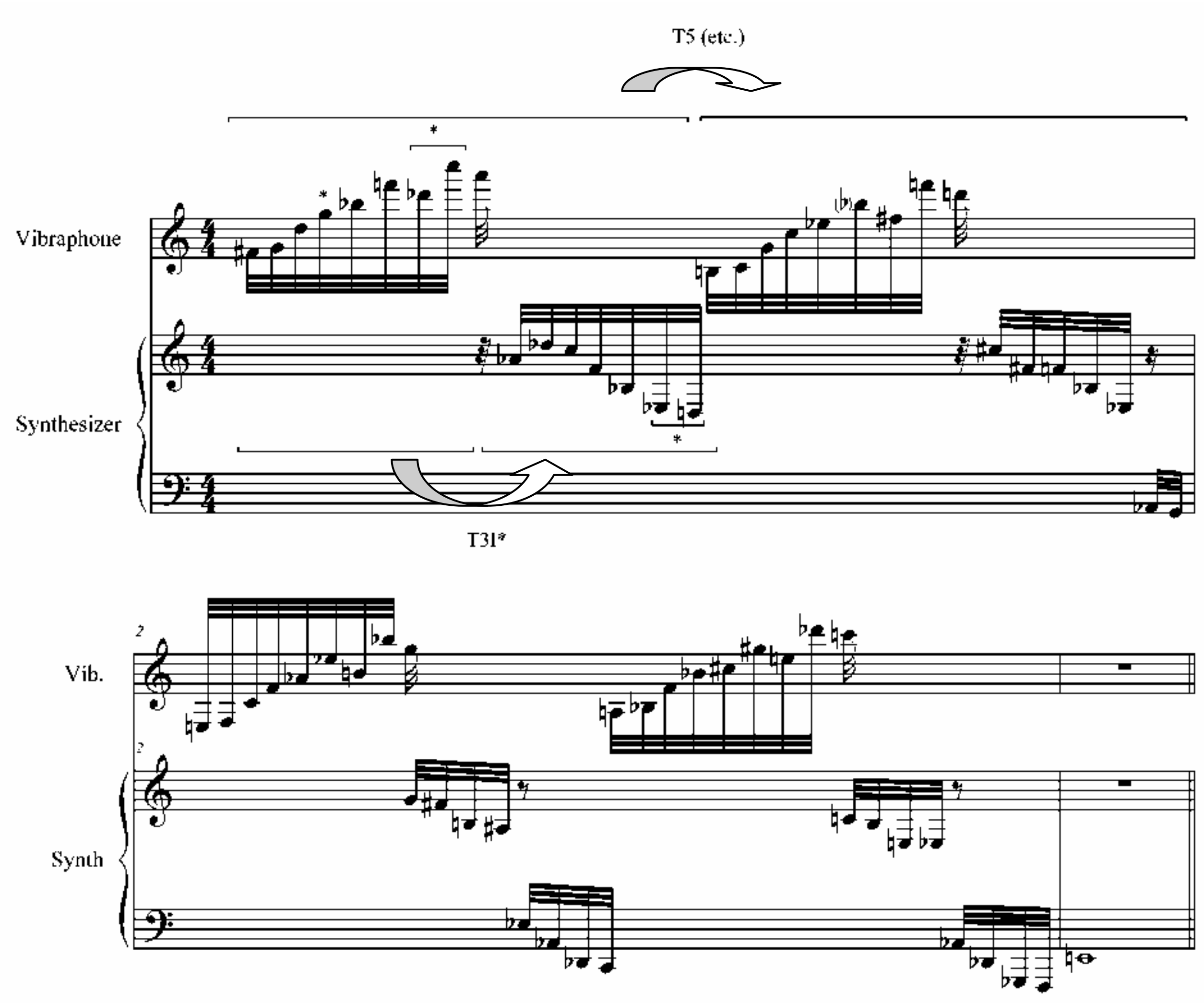
Example 5.11. “Manx Needs Women,” B section.



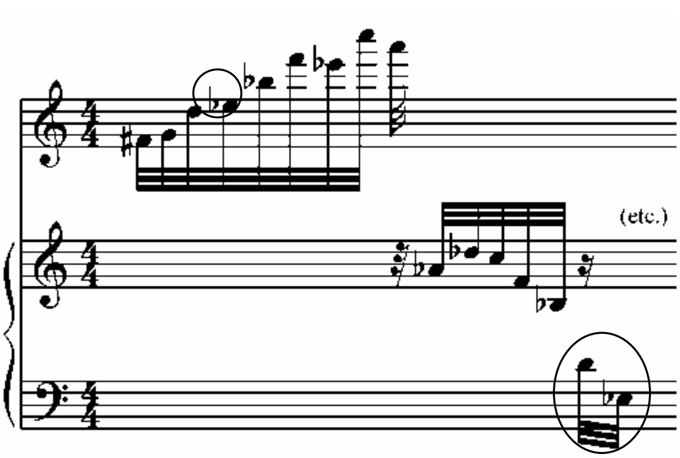
Example 5.12. “Be-Bop Tango” mm. 31–33.



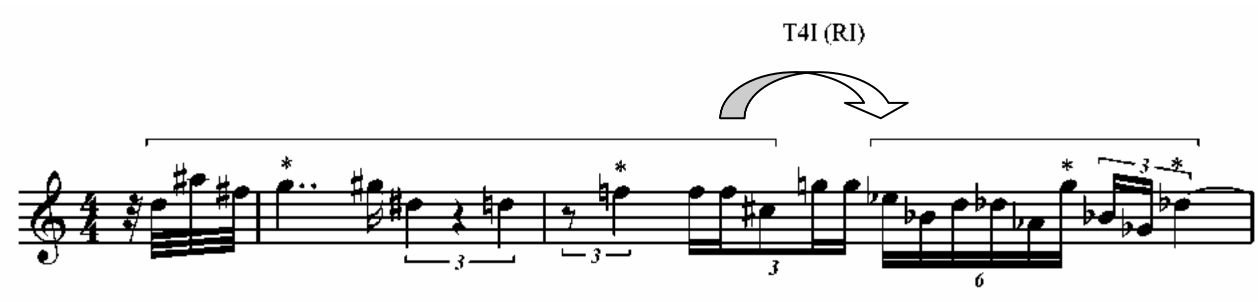
Example 5.13a. “Dupree’s Paradise,” introduction.



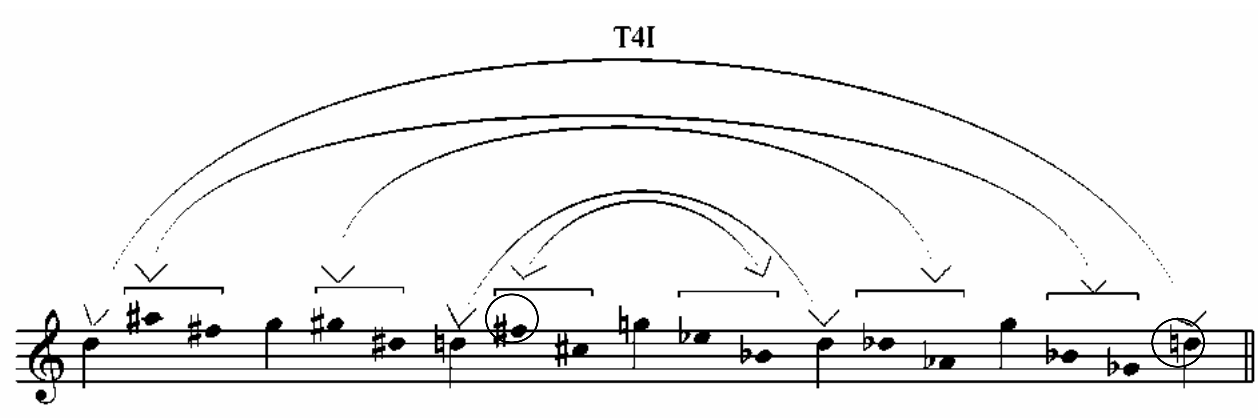
Example 5.13b. Idealized version of opening motive.



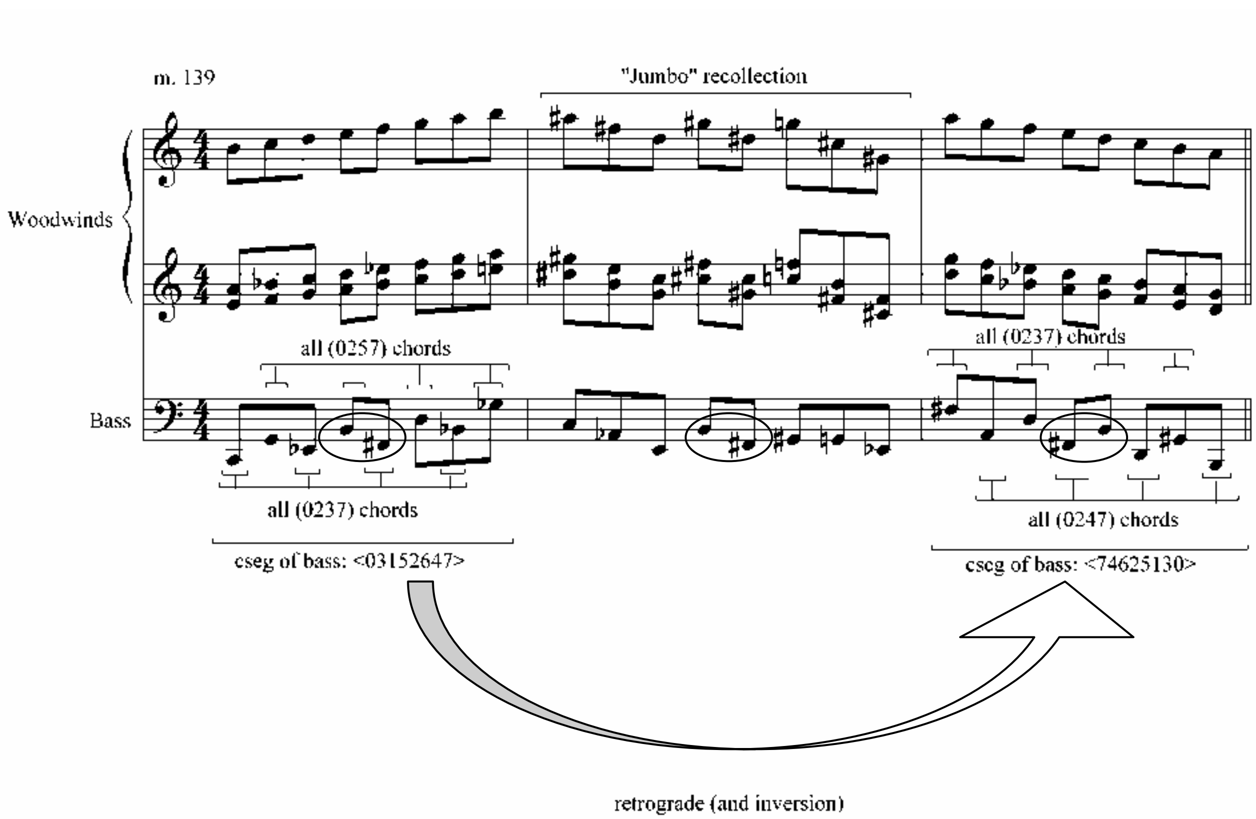
Example 5.14a. “Jumbo Go Away” interlude: main theme.



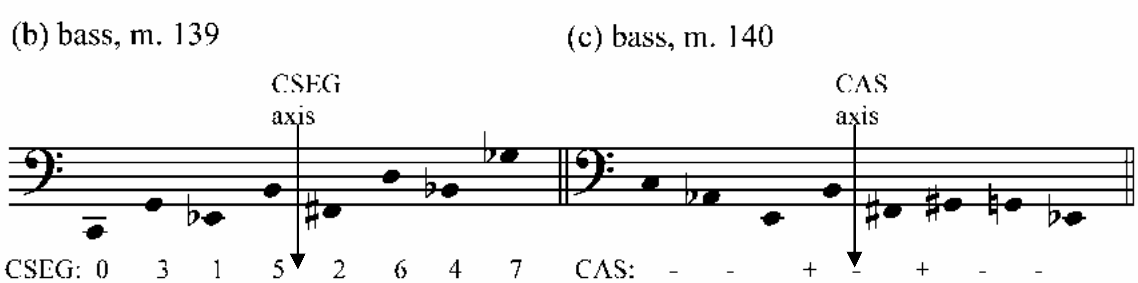
Example 5.14b. Idealized pitch sequence.



Example 5.15a. “Sinister Footwear II” (ACE), mm. 139–141.



Example 5.15 (b) and (c), contour symmetry in mm. 139–140 of “Sinister Footwear II.”

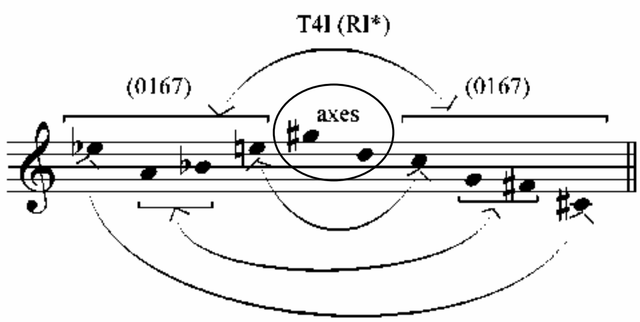


Example 5.16. “The Eric Dolphy Memorial Barbecue.”

(a) (*Weasels Ripped My Flesh* 0:34–0:44)

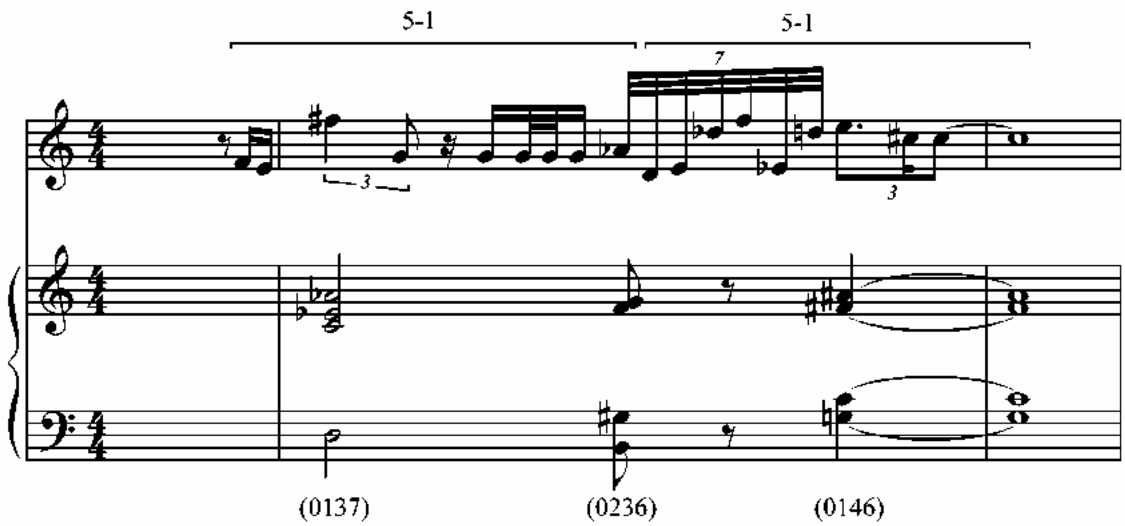
(b) (1:19–1:27)

(c) symmetry in pitch sequence

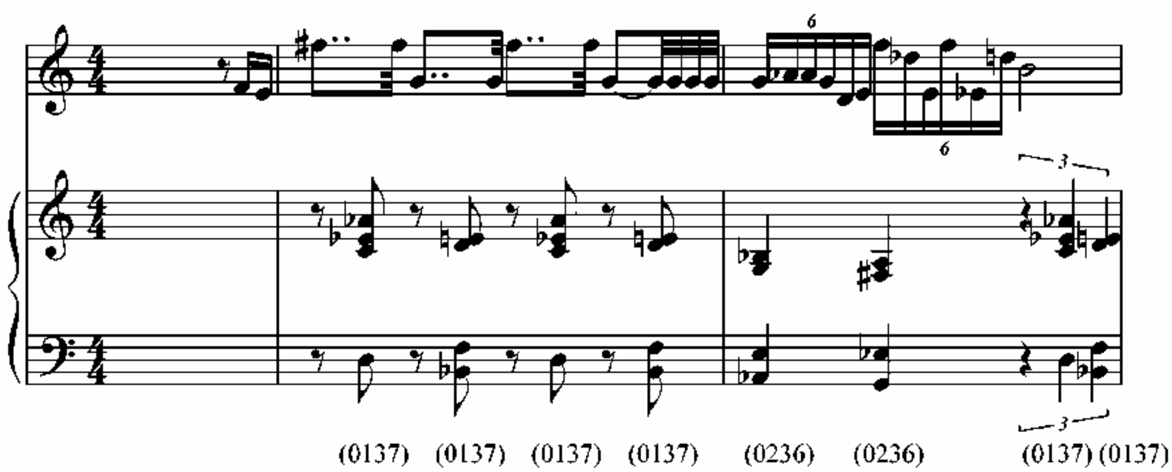


Example 5.17. “Be-Bop Tango,” main theme with accompaniment.

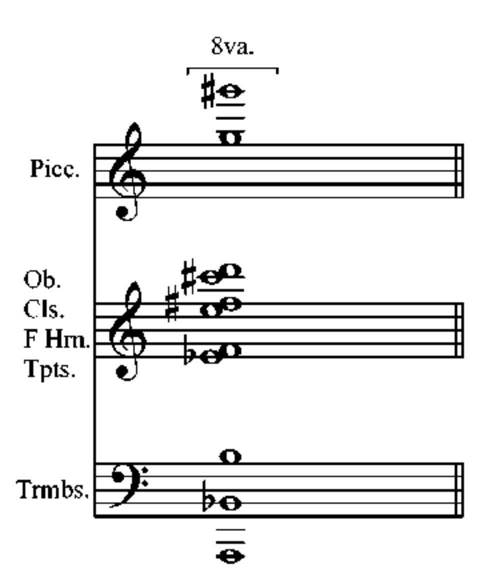
(a) mm. 4–6



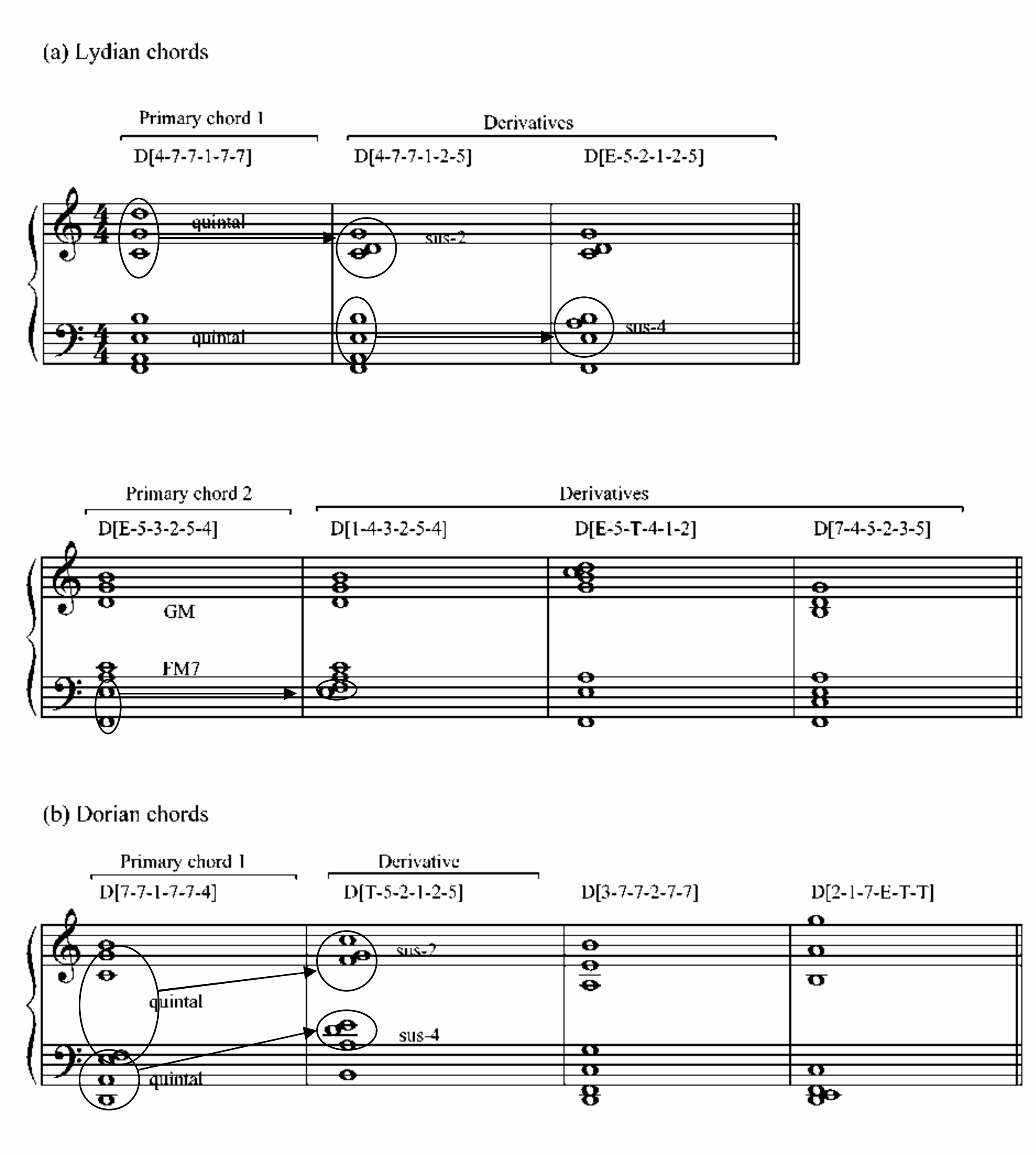
(b) mm. 12–14



Example 5.18, Varèse, *Intégrales,* 4 measures before reh. 3.

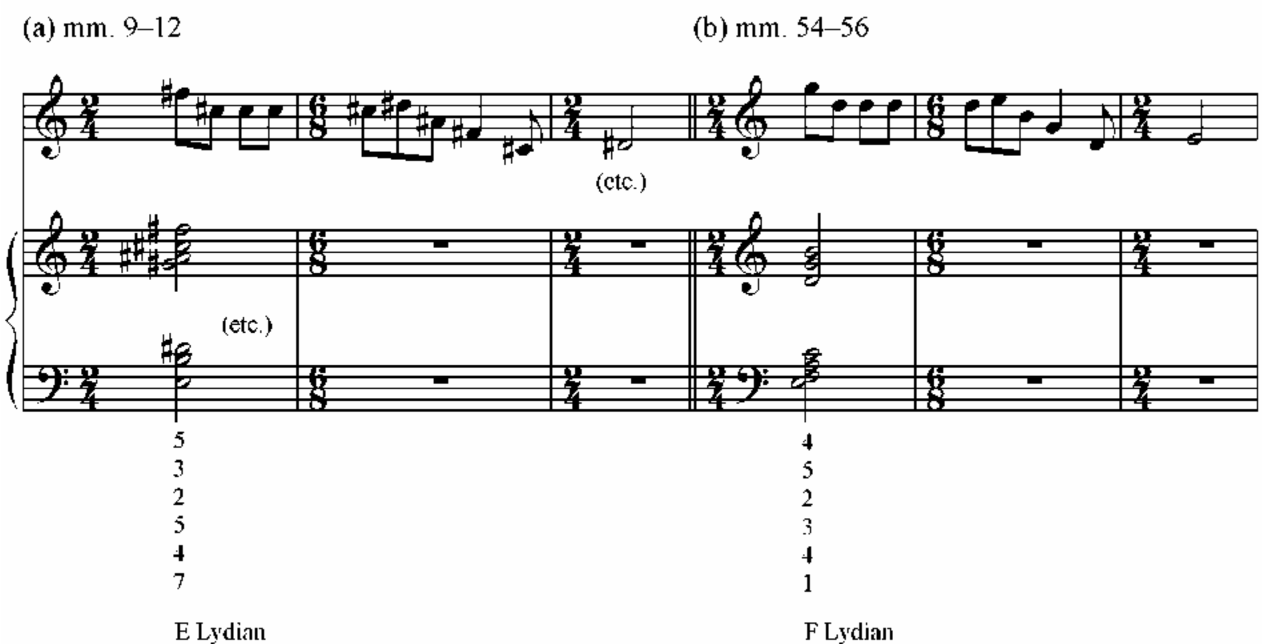


Example 5.19. Diatonic chords of the Chord Bible.



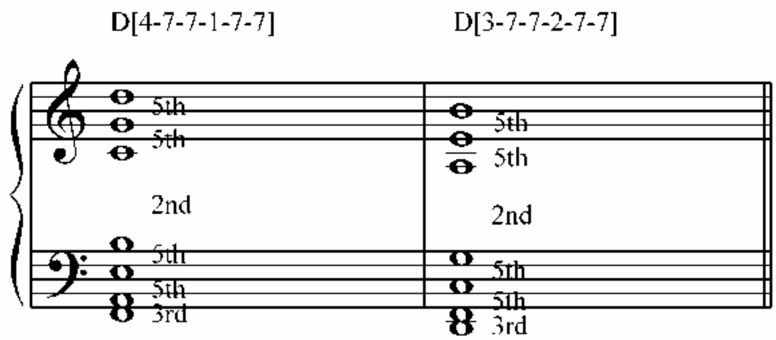
Example 5.20. “Sinister Footwear II” m. 138.

Example 5.21. “Dupree’s Paradise” (ACE):
Chord-Bible harmonies accompanying main theme.

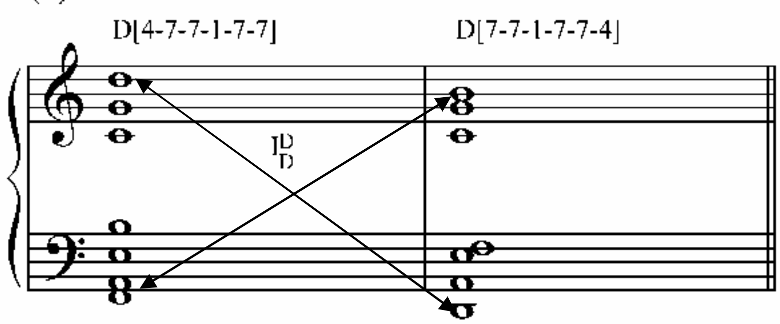


Example 5.22. Derivation of Dorian chords from Lydian Primary chord 1.

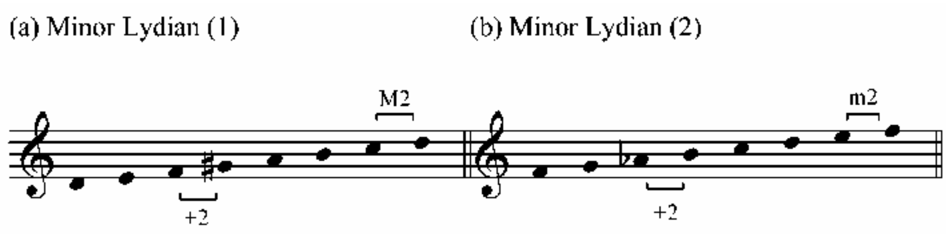
(a)



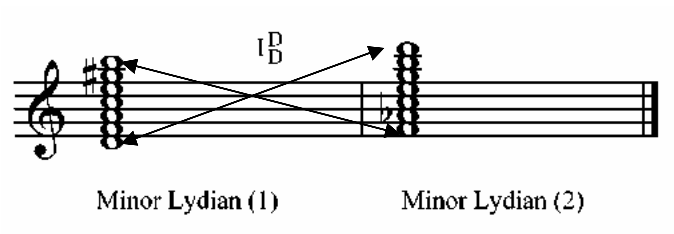
(b)



Example 5.23. The Minor Lydian scale.

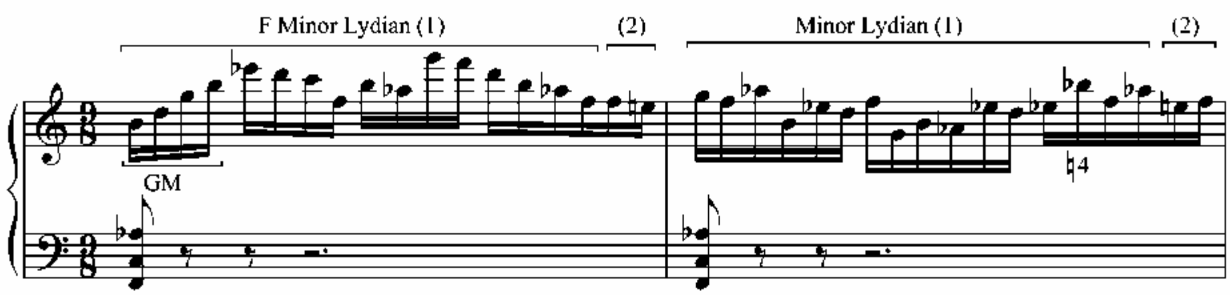


Example 5.24. Inversional relationship between Minor Lydian (1) and (2).

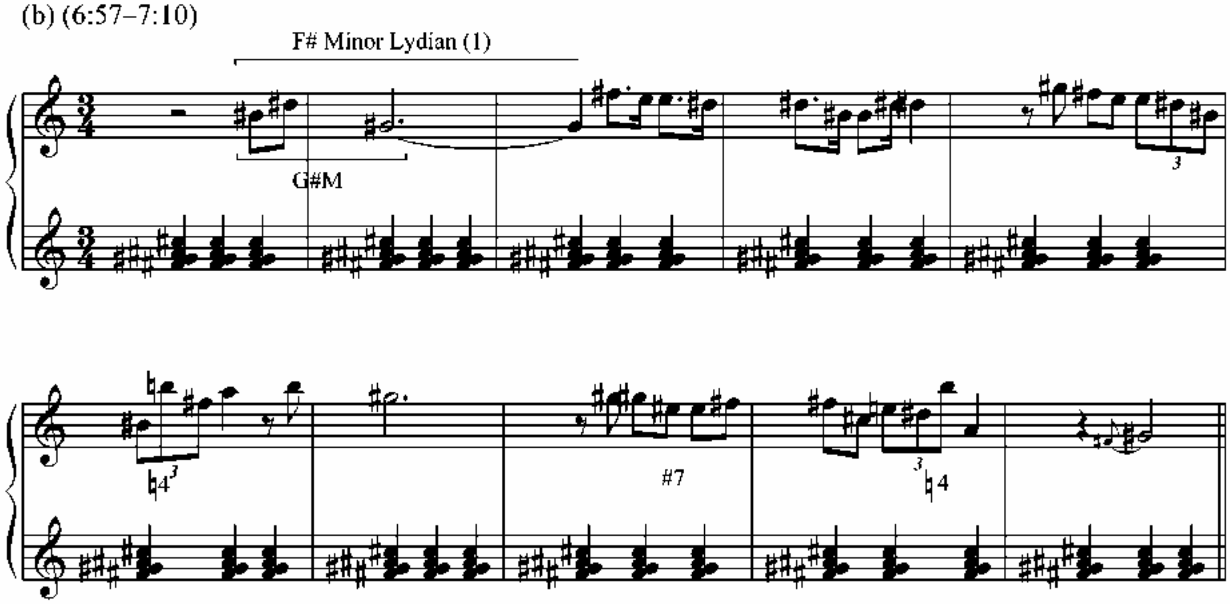


Example 5.25. Use of Minor Lydian scale within "Drowning Witch."

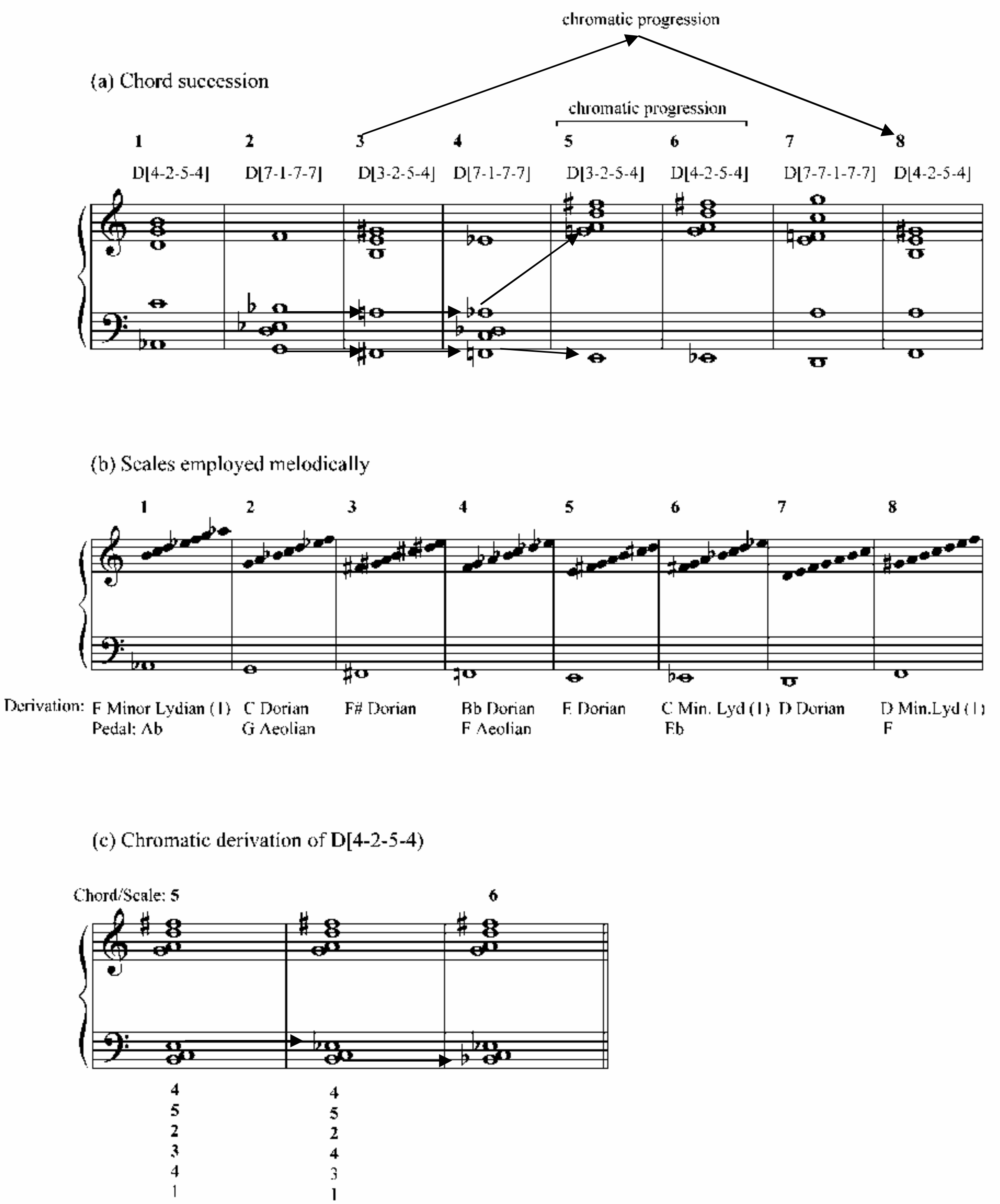
(a) (*Ship Arriving* . . . 2:14–2:18)



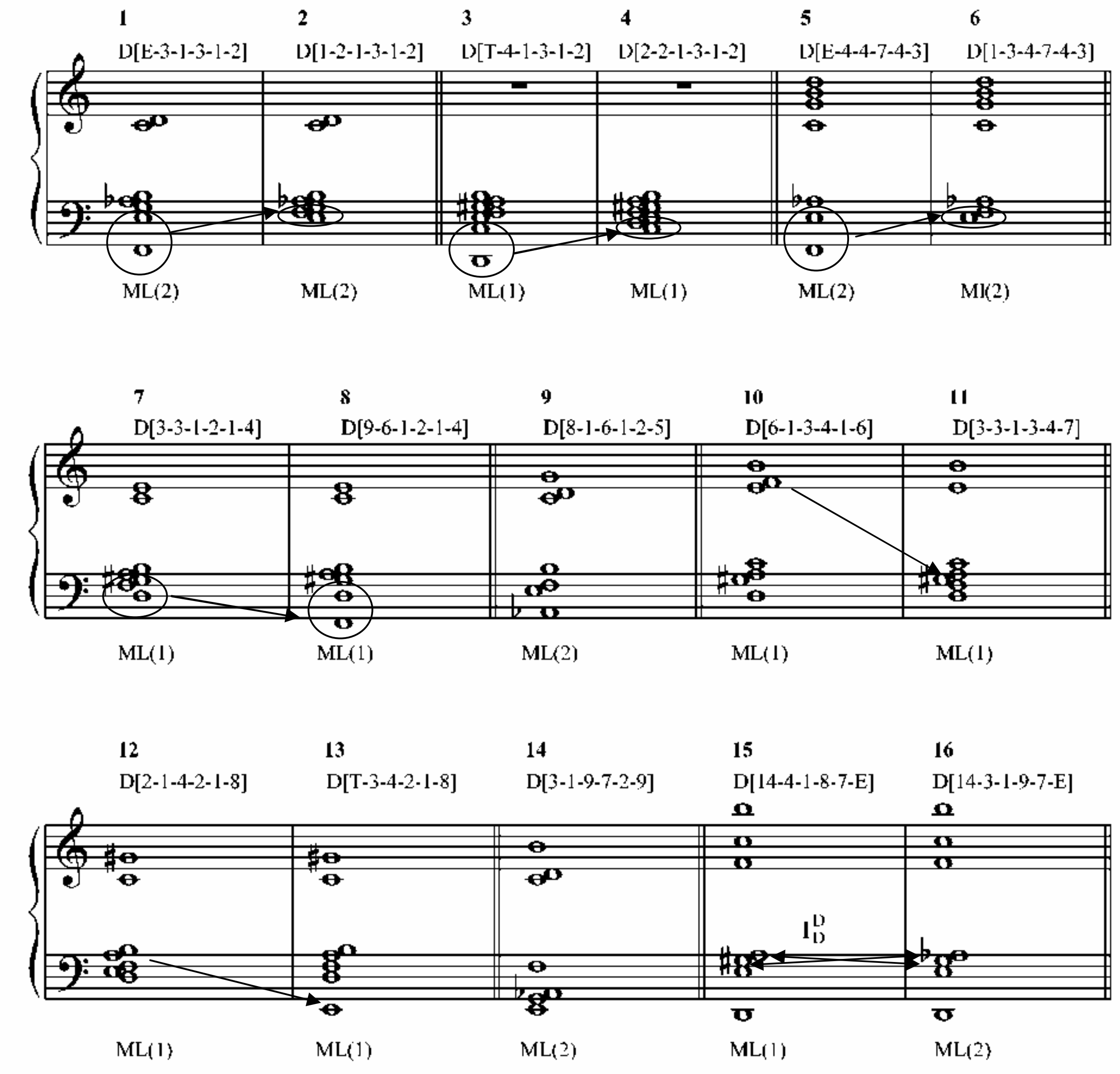
(b) (6:57–7:10)



Example 5.26. “Sinister Footwear II,” post-solo section (*Them or Us* 7:20–8:23).



Example 5.27. Minor Lydian chords of the Chord Bible.

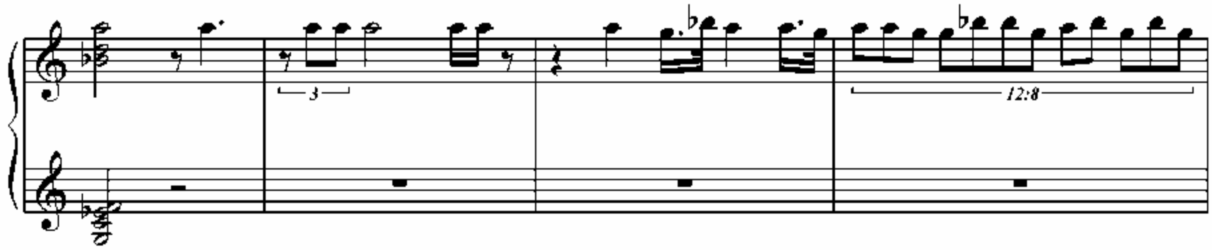


Example 5.28. “Alien Orifice”
Minor Lydian Chord-Bible substitutions.

Example 5.28. (cont.)

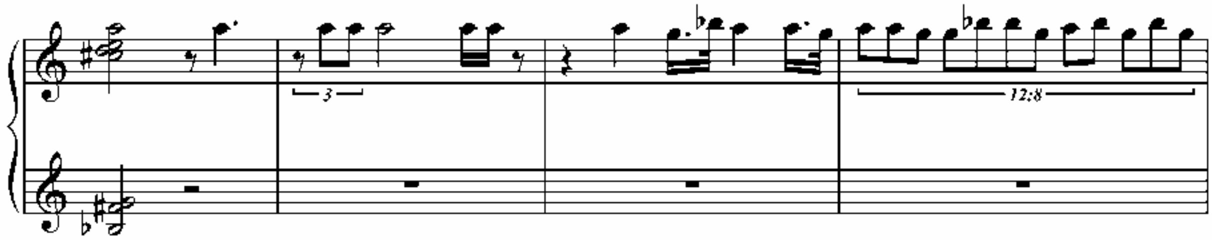
(b) Theme reprise

Phrase 1:



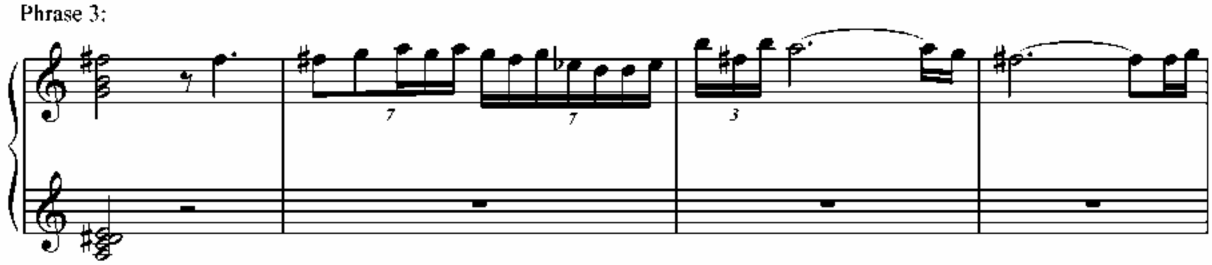
Chord: D[5-3-2-5-4-7]
Scale: C Dorian (substitute for Eb Lydian)

Phrase 2:



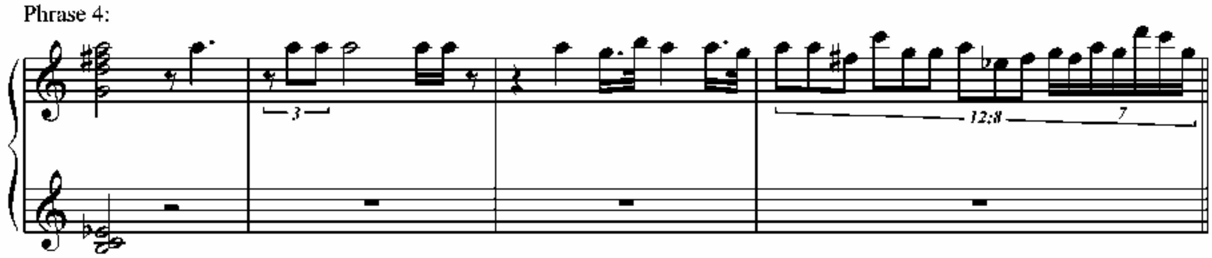
Chord: D[8-1-6-1-2-5]
Scale: G Minor Lydian (2) (substitute for E Dorian)

Phrase 3:



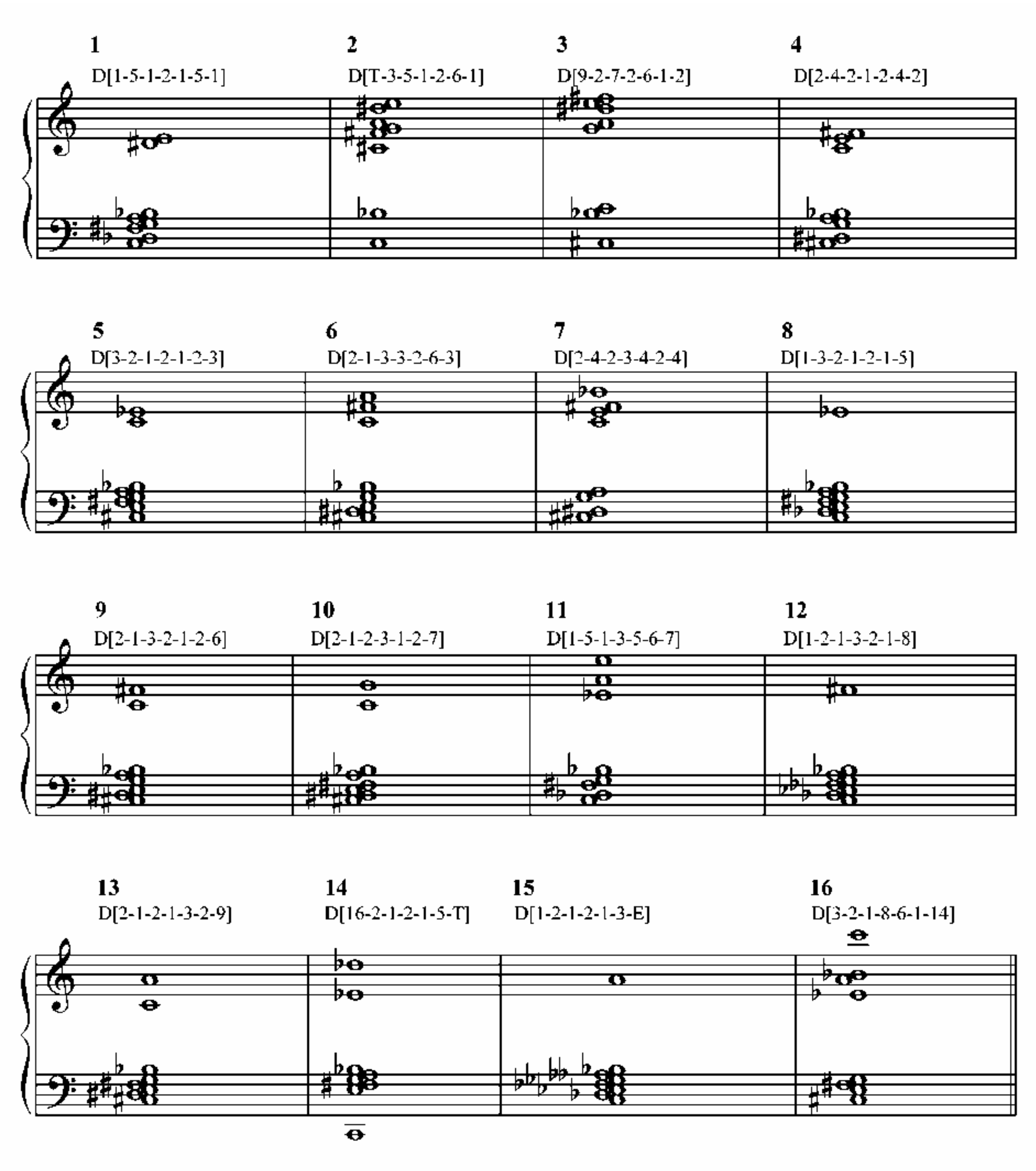
Chord: D[3-3-1-3-4-7]
Scale: A Minor Lydian (1) (substitute for C Lydian)

Phrase 4:

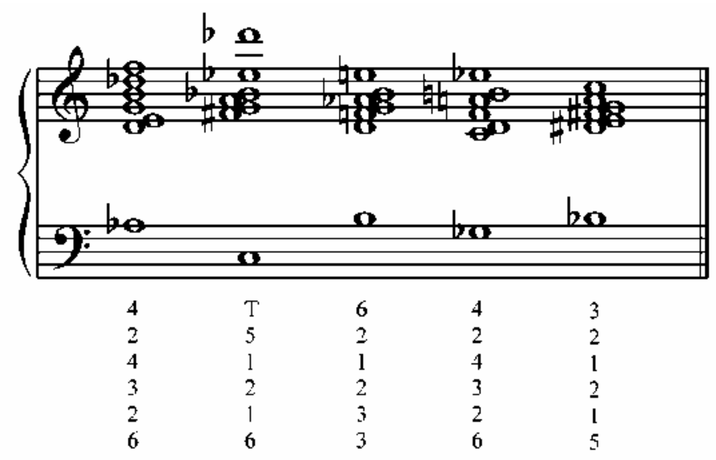


Chord: D[1-3-4-7-4-3]
Scale: C Minor Lydian (2)

Example 5.29. Octatonic chords of the Chord Bible.

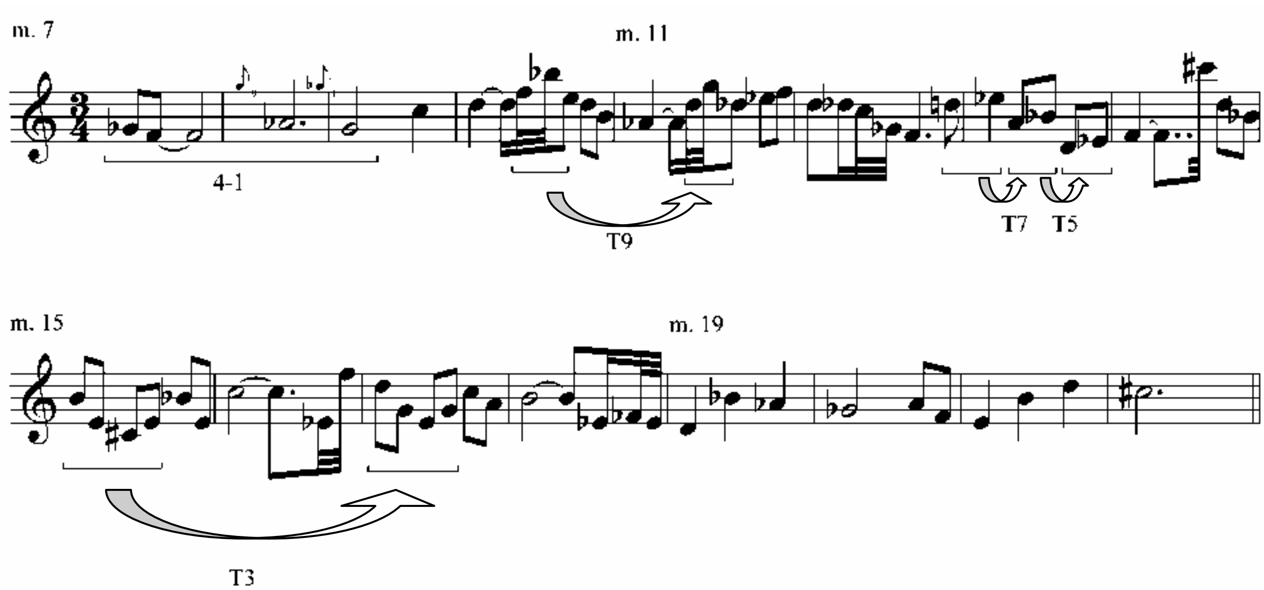


Example 5.30. Seven-note Octatonic chords at m. 37 of “The Perfect Stranger.”



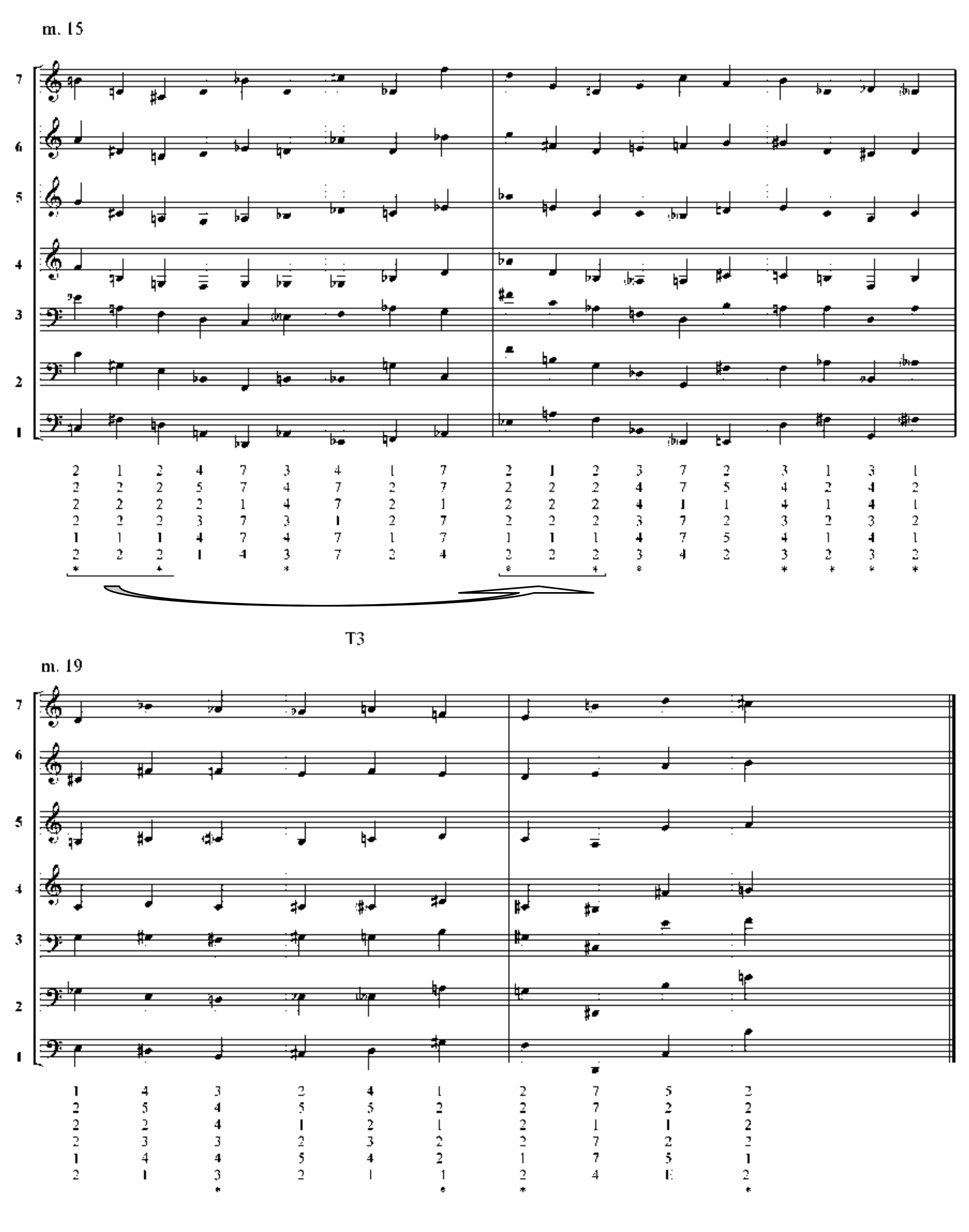
Example 5.31. “Envelopes” mm. 54–55 (*London Symphony Orchestra* 2:12–2:16).

Example 5.32. “Envelopes” main theme: mm. 7–22.



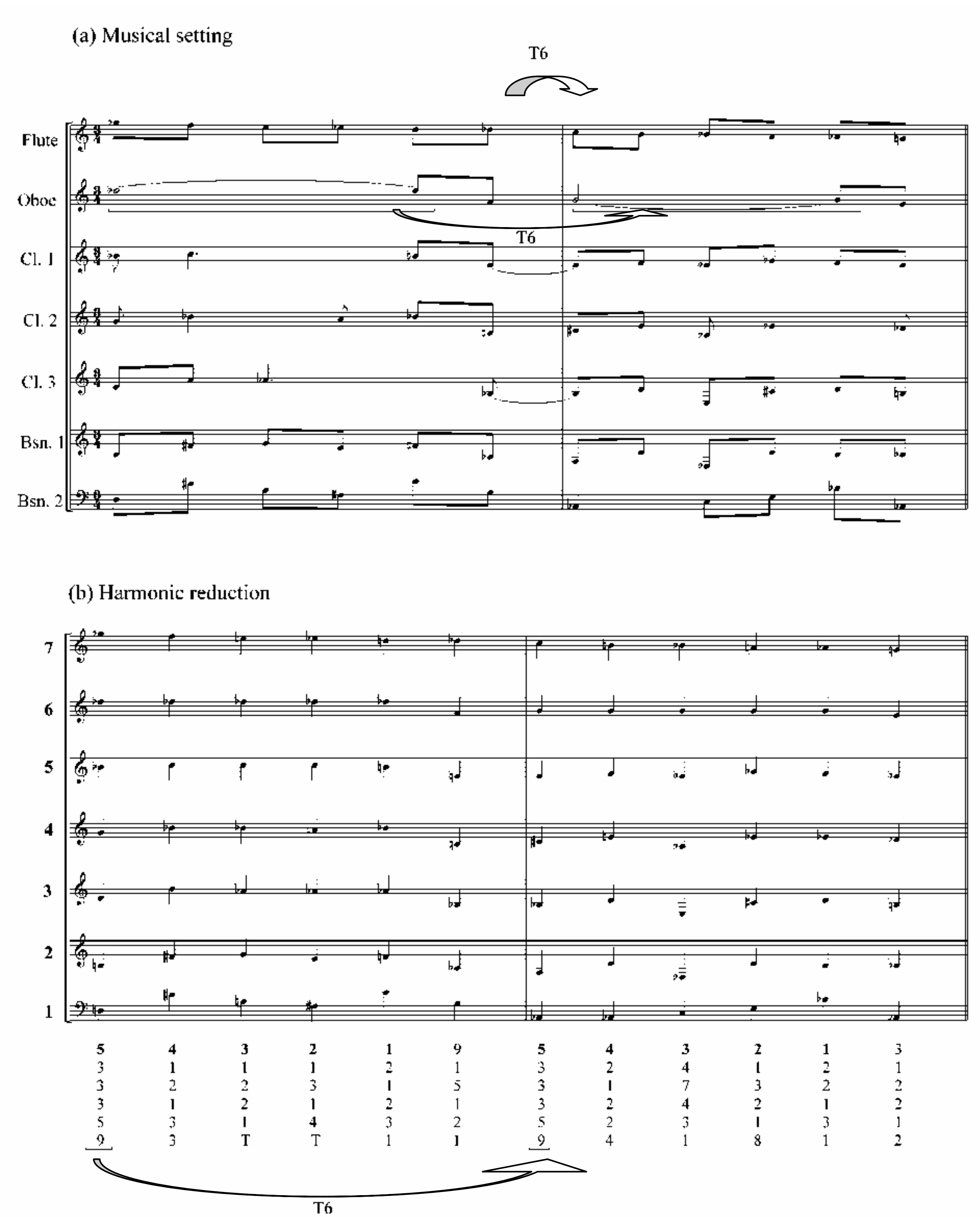
Example 5.33. “Envelopes” main theme: Chord-Bible harmonization.
Non-diatonic chords marked with *.

Example 5.33. (cont.)



Example 5.34. “Envelopes” mm. 23–38.
Pitches harmonized by Non-Minor Lydian chords marked with *.

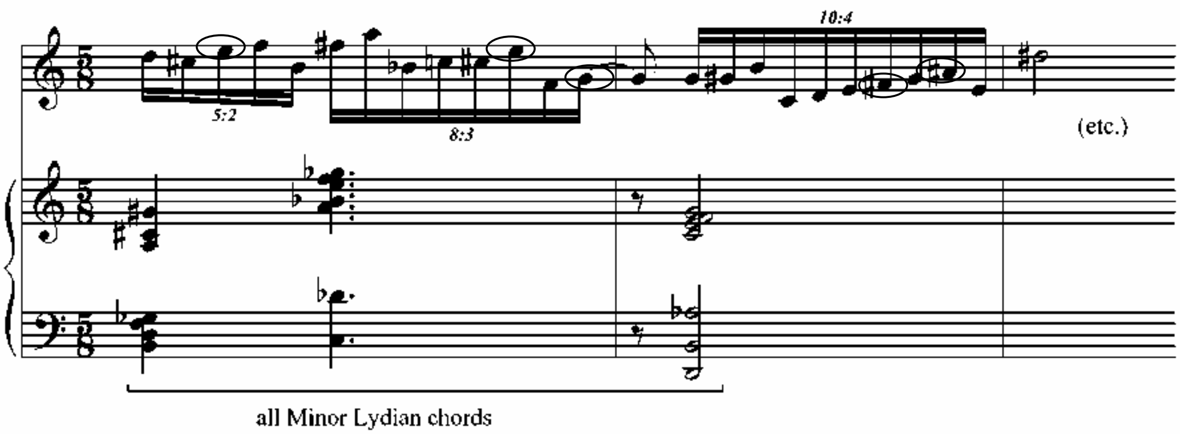
Example 5.35. “Envelopes” mm. 5–6 (0:10–0:16).



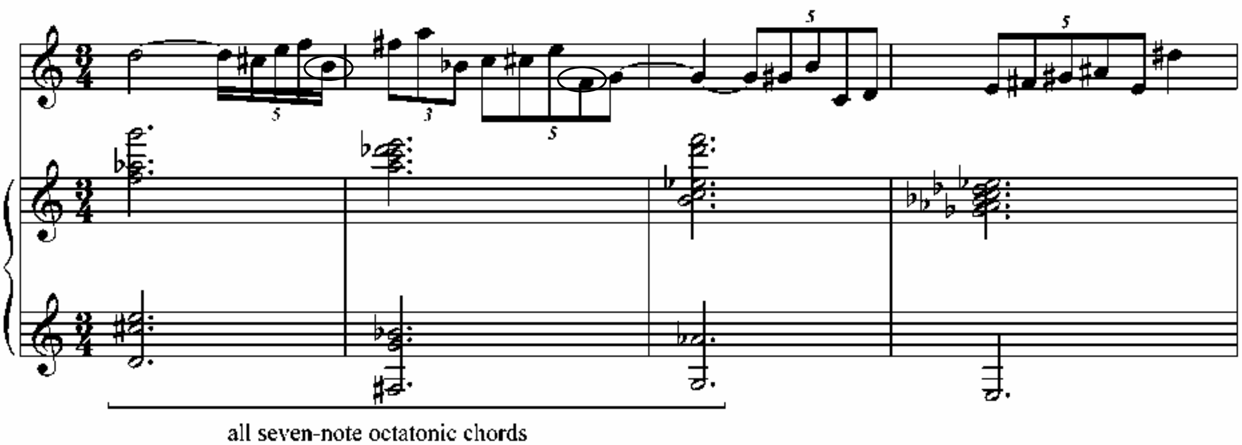
Example 5.36. “Envelopes” mm. 88–end.

Example 5.37. "Sinister Footwear I":
Thematic statements related by isomelism, with Chord-Bible accompaniments.

(a) Reh. D, mm. 82–84



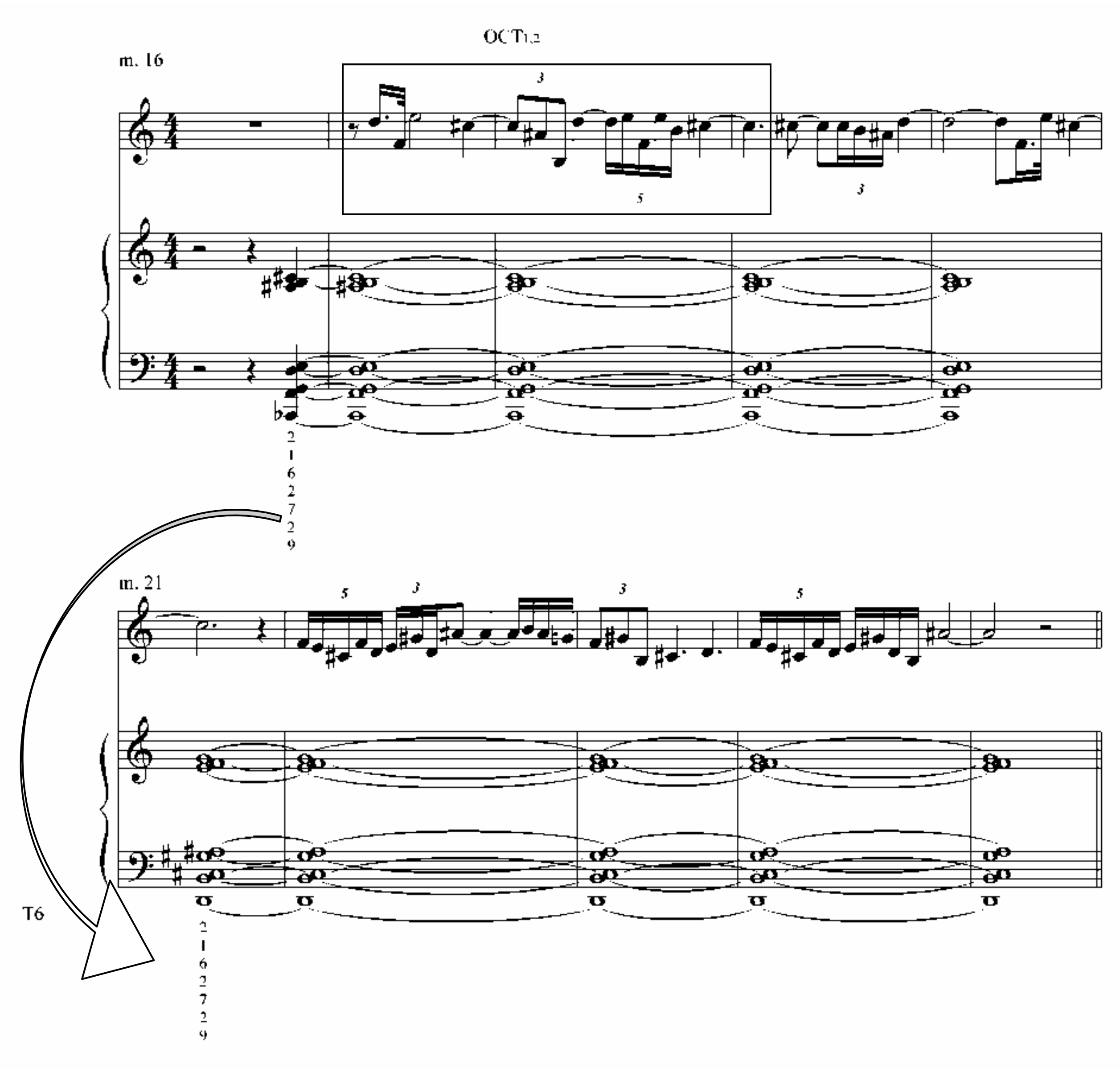
(b) Reh. F, mm. 137–140



Example 5.38a. “The Perfect Stranger I” mm. 8–17 (*The Perfect Stranger* 0:16–0:36).

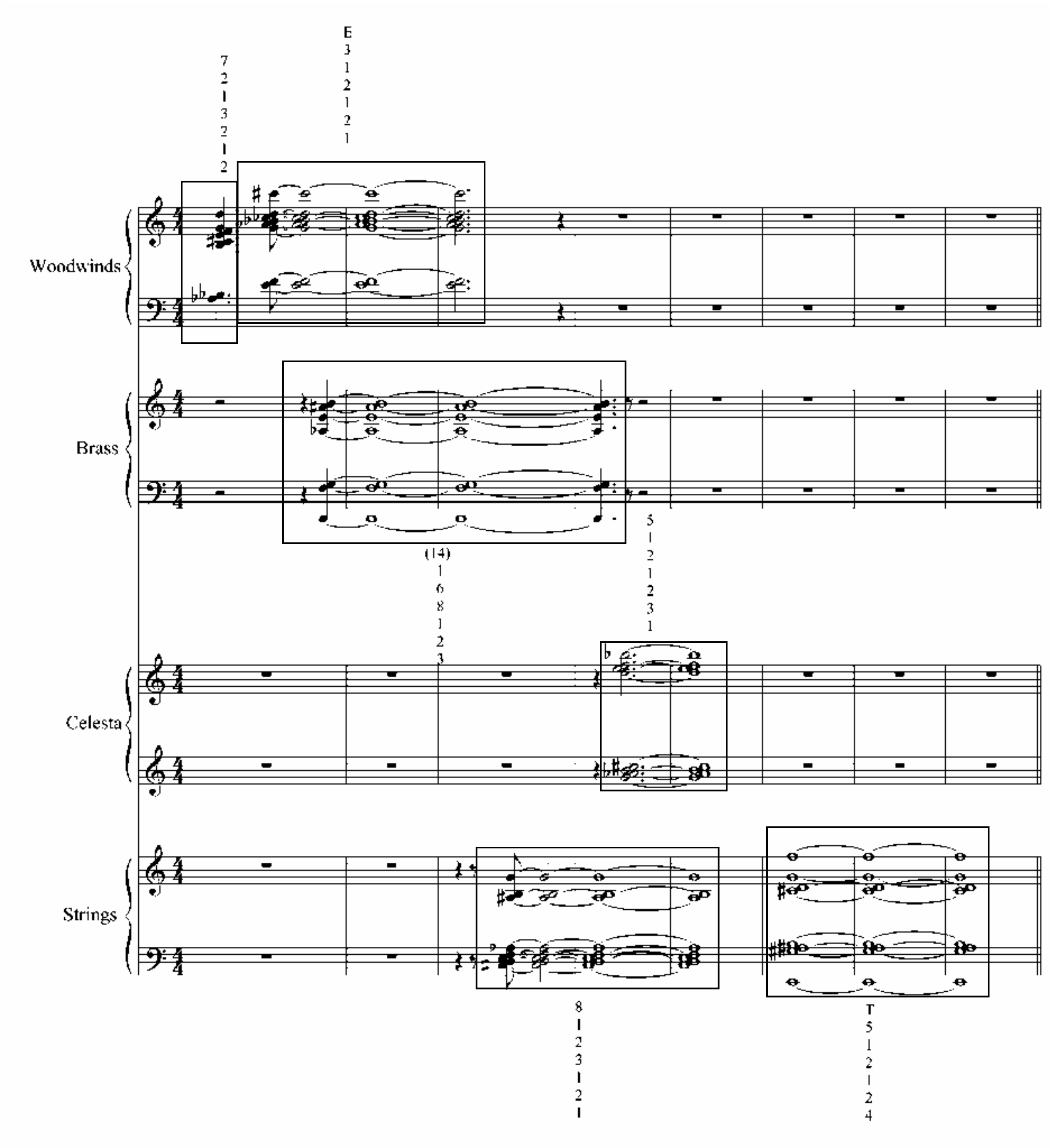
Example 5.38b. "The Perfect Stranger I" mm. 43–46 (1:46–1:56):
$OCT_{1,2}$ chords marked with *.

Example 5.39. “The Perfect Stranger II” mm. 16–25 (4:20–4:44).

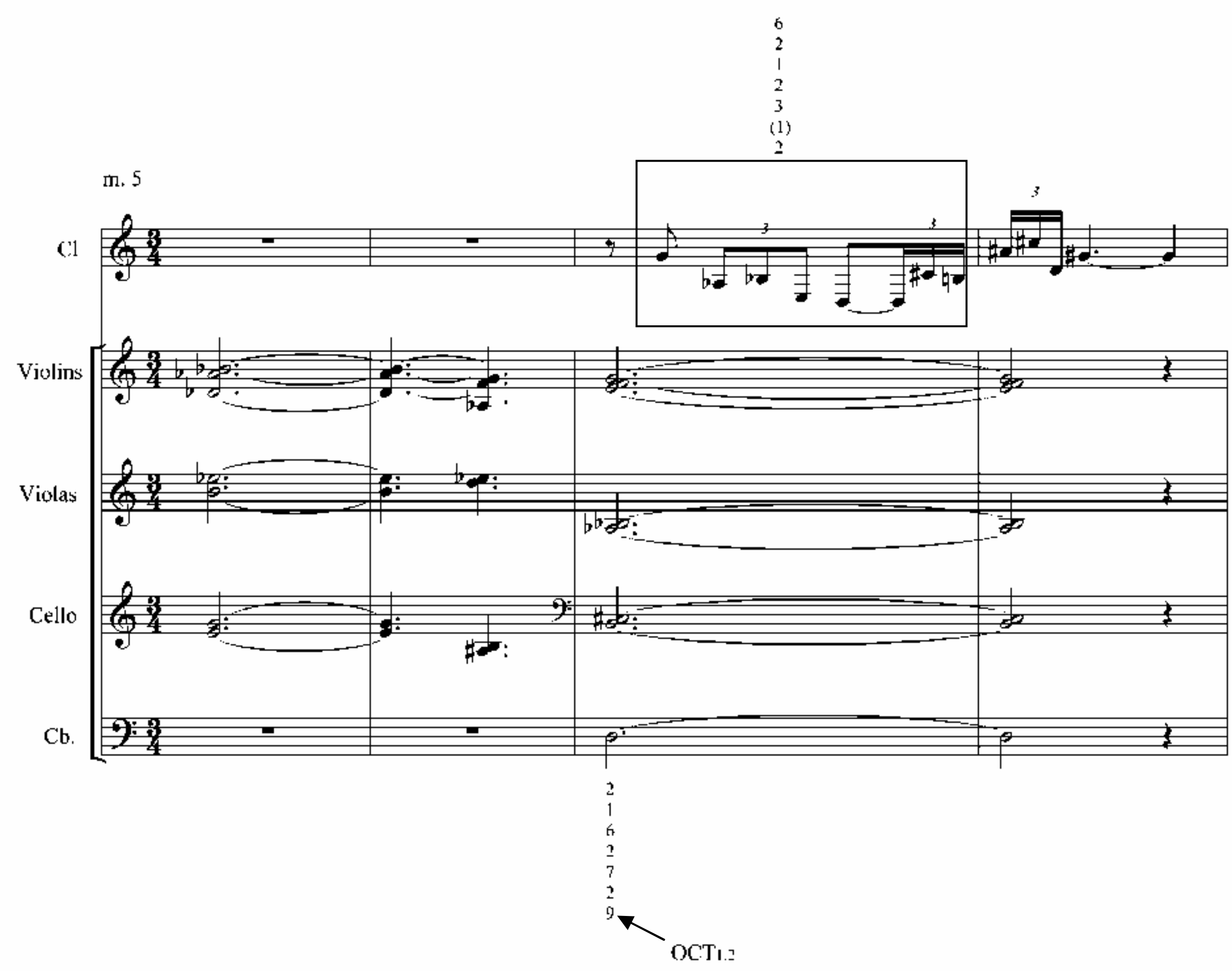


Example 5.40. “The Perfect Stranger I” mm. 48–51 (2:04–2:09).

Example 5.41. “The Perfect Stranger II” mm. 1–8 (3:50–4:00).

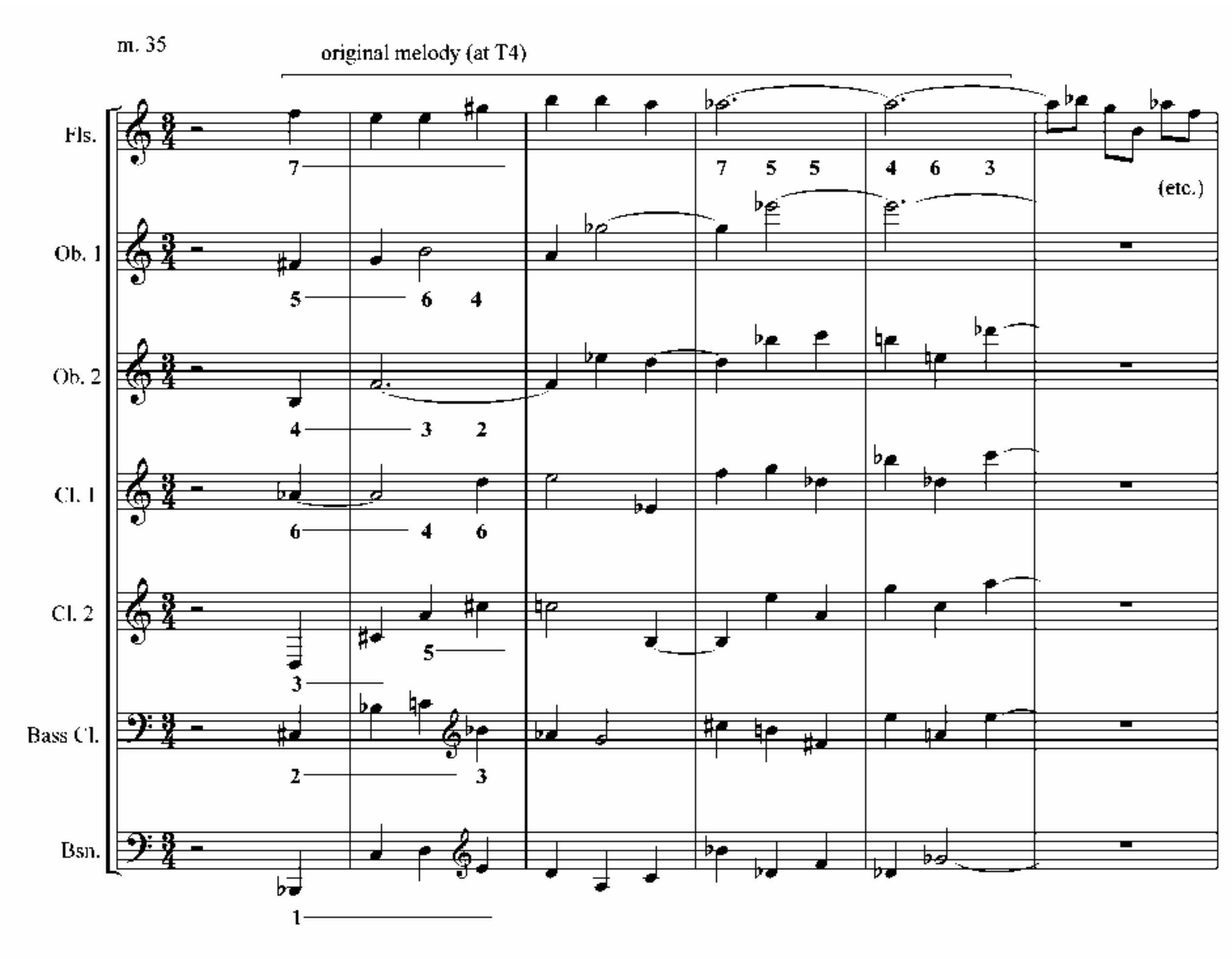


Example 5.42a. “The Perfect Stranger I” mm. 5–8.

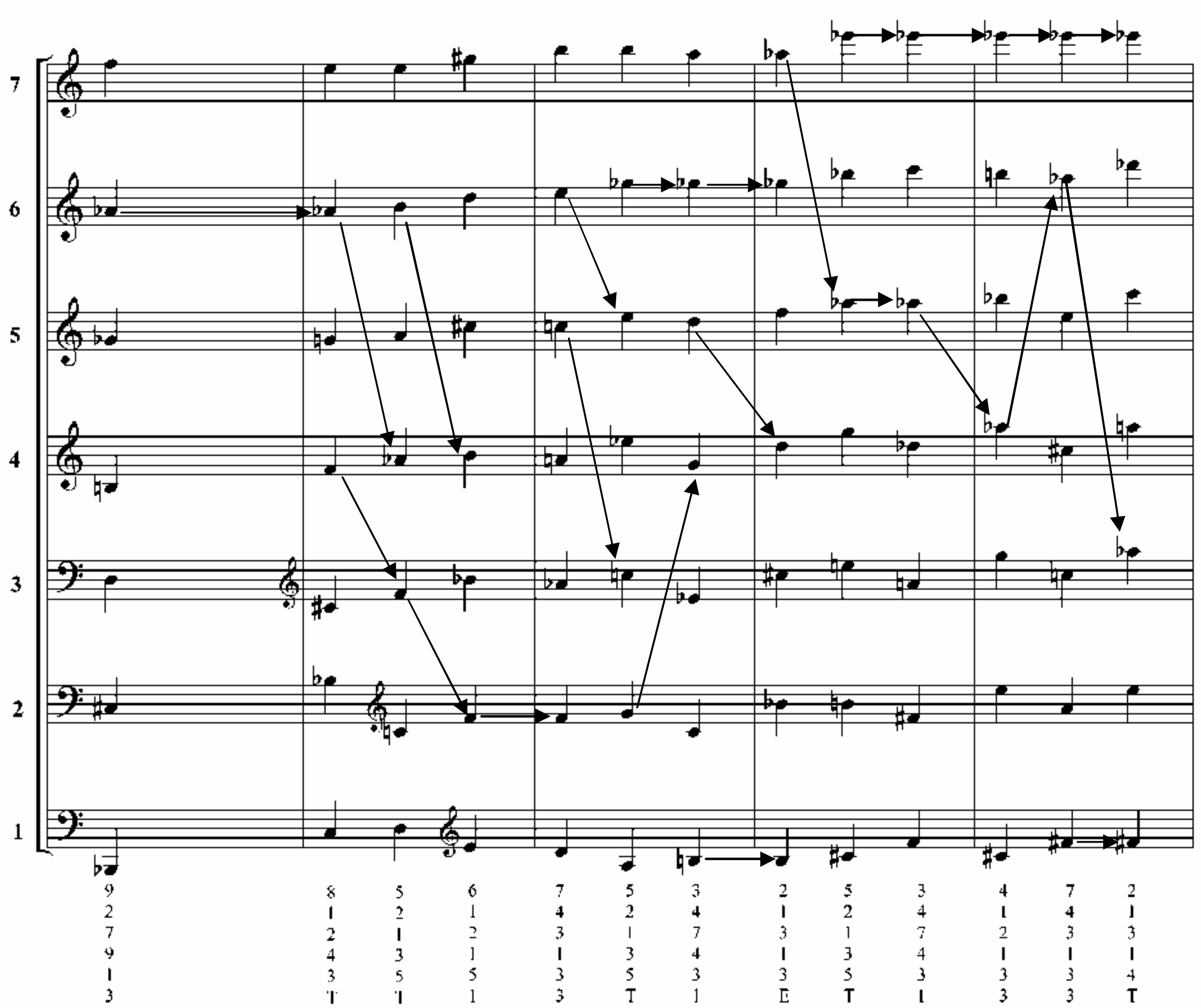


Example 5.42b. “The Perfect Stranger II” mm. 56–60 (5:52–6:04).

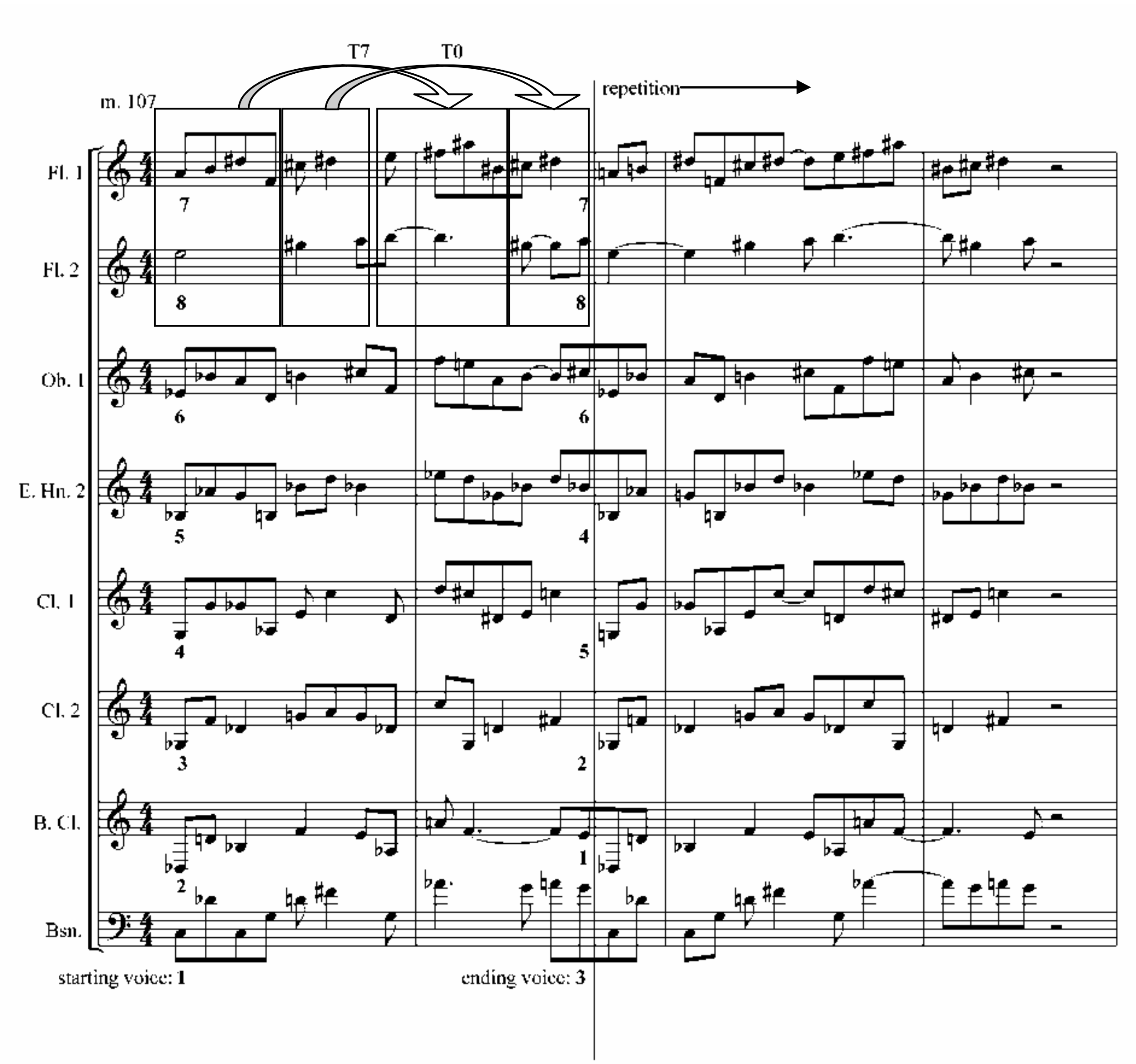
Example 5.43a. “Dupree’s Paradise” mm. 35–40 (*The Perfect Stranger* 0:43–0:51).



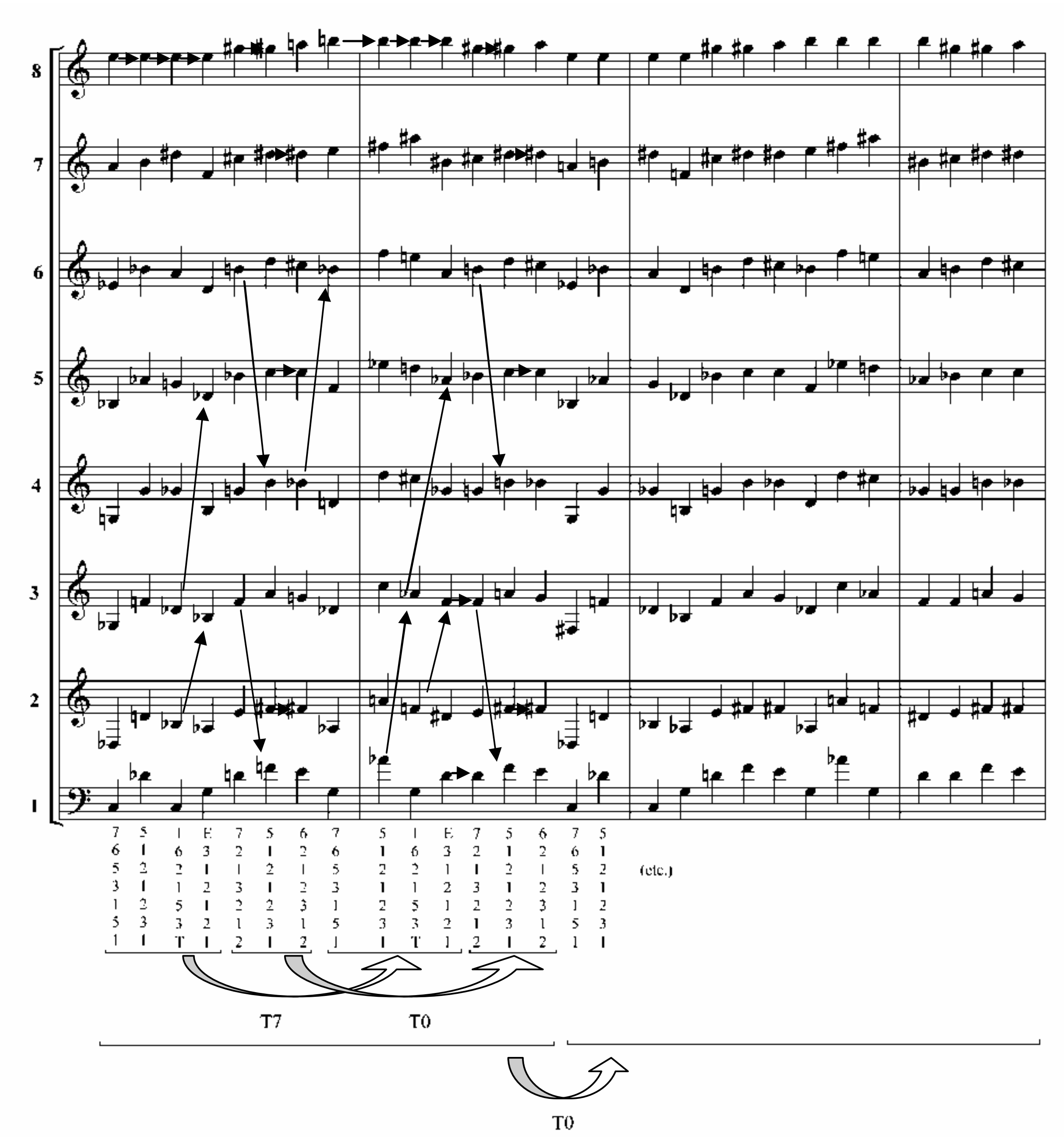
Example 5.43b. “Dupree’s Paradise” mm. 35–39: harmonic reduction.



Example 5.44a. “Dupree’s Paradise” mm. 107–110 (2:19–2:25).

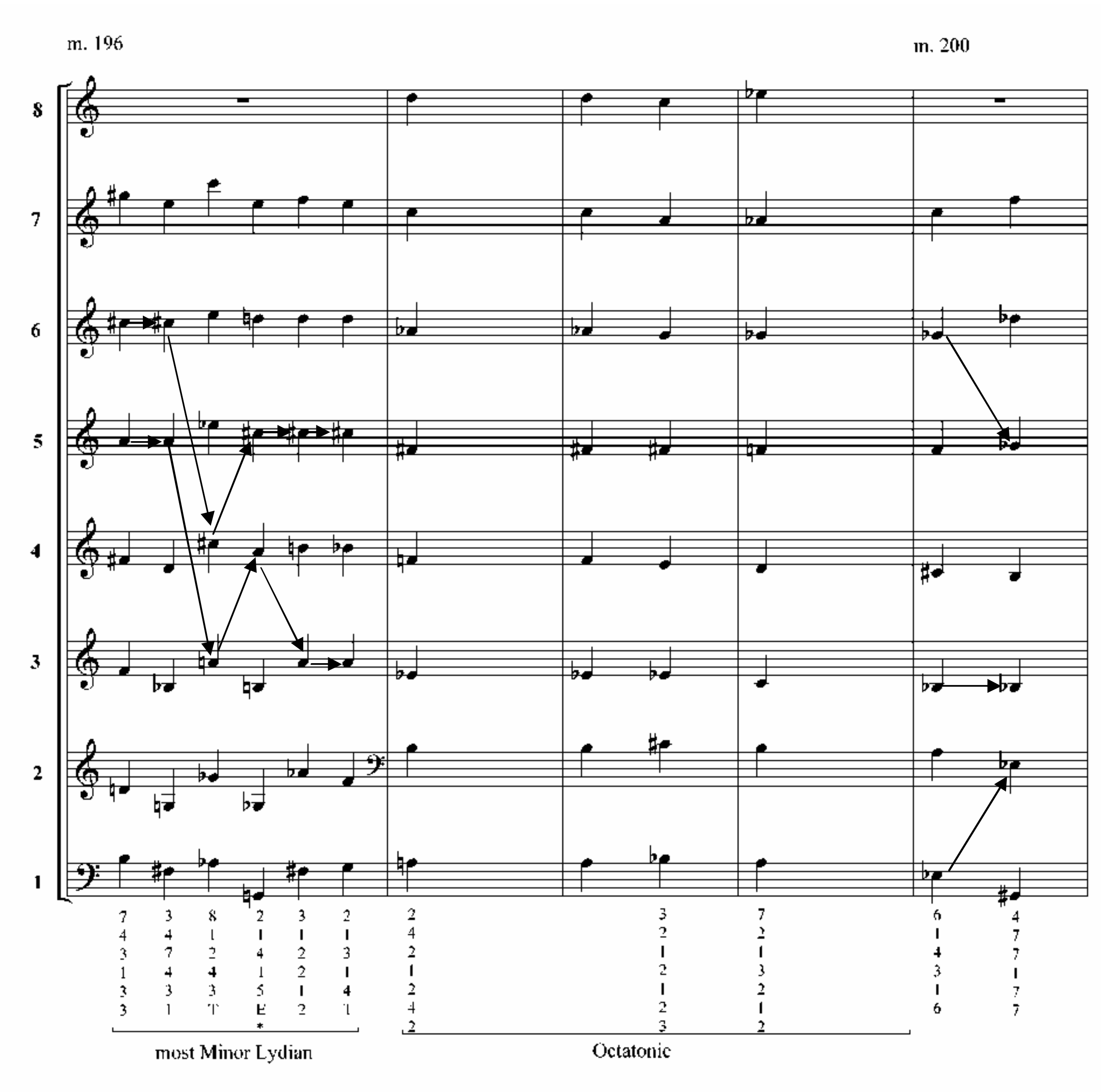


Example 5.44b. “Dupree’s Paradise” mm. 107–110: harmonic reduction.



Example 5.45a. “Dupree’s Paradise” mm. 196–200 (4:33–4:43).

Example 5.45b. “Dupree’s Paradise” mm. 196–200: harmonic reduction.



Example 5.46a. “Dupree’s Paradise” mm. 131–135 (3:02–3:10).

Example 5.46b. "Dupree's Paradise" mm. 131–135: harmonic reduction.