PERFORMANCE ANALYSIS AND ANALYSIS FOR PERFORMANCE: A STUDY OF VILLA-LOBOS'S *BACHIANAS BRASILEIRAS* No. 9

by

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CERTIFICATE OF APPROVAL

D.M.A. ESSAY

This is to certify that the D.M.A. essay of

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Essay committee:

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Take as a musical example the musical pattern score of the playing of one movement of a Beethoven sonata by a recognized artist. It would require volumes to analyze and evaluate all the facts contained therein

Carl Seashore
"The Objective Recording and Analysis of Musical Performance" *Iowa Studies in the Psychology of Music*, (1935) IV- 6.

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PREFACE

This study of Villa-Lobos's *Bachianas Brasileiras No. 9* aims at gaining insight into the decision-making processes of translating a score into a musical performance. Chapter I presents a discussion of selected issues related to interpretative analysis. Chapter II is an overview of the approaches to recording comparison deemed relevant to the present study. Chapter III is a comparative study of the vocal and string versions of *Bachianas Brasileiras No. 9*, while Chapter IV offers a structural analysis of the work. Chapter V compares four recordings: the composer's own with the *Orchestre National de La Radiodiffusion Française*—EMI 7243 5 66964 2 6; Odaline de la Martinez and the BBC Singers, LNT 102; Michael Tilson Thomas and the New World Symphony —RCA 09026-68538-2; and my own CD, *Construção, Orquestra de Câmara Theatro São Pedro*- Limited Edition (live recording made on December 11, 1995 in Bayreuth, Germany). This comparison utilizes data obtained with the software *Tempo*. The tabulation of these results is shown in graphs that compare how matters of tempo flexibility affect each performance. This multi-faceted study shows that although painstaking analysis can lead to insightful solutions, the fleeting nature of musical performance requires an open mind and imagination to deal with the often contradictory directives of the score.

INTRODUCTION

Performers frequently turn to score analysis as a means to answer questions and support interpretative decisions. It is generally accepted that a thorough knowledge of the score will benefit performance. Looking at internal evidence in scores is regarded as a way to expand the possibilities for creative performance.

A number of authors have discussed matters of analysis and performance. Their approaches are as wide-ranging as their conclusions are disputed. Looking for help in the growing literature on the subject can be quite discouraging. John Rink, a pianist and analyst, aptly describes the situation when he says that:

> scanning the literature on analysis and performance from the last twenty-five years or so, one is struck by serious discrepancies between what the principal writers on this subject . . . mean when they refer to ‘analysis' in relation to performance. Throughout the literature this sort of analysis is defined in such disparate, often incompatible ways that profound confusion can result for those interested in exploring the less than straightforward connection between the two activities.[1]

Later, he says that

> the notion that performers must have 'theoretical and analytical competence' is like claiming that one must be able to identify all grammatical constructs and parts of speech in order to speak articulately. Embarrassment at the subjective, unsystematic vocabulary used by many performers to describe music . . . has provoked a reaction against the seemingly naive interpreter. . . as a result we tend—unjustly—not to consider performers as serious thinkers about music. . .. [blinding] us to the fact that good performers are continually engaged in a process of ‘analysis’[2]

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[1] John Rink, Review of *Musical Structure and Performance* by Wallace Berry, *Music Analysis*, 9:3 (1990): 319.

[2] Rink, “Review of *Musical Structure*,” 323.

He also says that

> good performers rely at least in part on . . . 'informed intuition' (or 'acquired intuition'), which accrues with a broad range of experience and which may exploit theoretical and analytical knowledge. . .. This term acknowledges that musicality is probably not innate (although the importance of talent should not be underestimated) but arises through imitation. One plays 'musically' when what has been learned through imitation is made one's own. . .[3]

As a performer, I agree that we are constantly engaged in a process of analysing music. Nevertheless, several questions remain. What are the goals of such analysis? Do performers acquire 'informed intuition' only through imitation, or through the analysis of scores and performances as well? Should performers base their decisions on:

a) "Informed intuition", as Rink proposes?.[4]
b) The study of performance traditions and conventions, as proponents of the historical performances suggest?
c) The thorough analysis of urtext score, as idealistic musicologists believe?
d) The analysis of other performances, as supported by a growing number of scholars?

Trying to answer all of these questions is beyond the scope of a single essay. I believe that all of the above factors are meaningful for performers. It is true that performers analyze music continuously, but it is also true that their approaches differ from that of theorists and historians. Insights obtained through different analytical methods may lead to alternative solutions to the same problem. Consequently, performers looking to solve performance-problems will have a greater pallet of options with a broader analytical approach. This essay, written from a performer's point of view, will analyze both the

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3 Rink, "Review of *Musical Structure*," 324.

4 Rink, "Review of *Musical Structure*," 328.

vocal and string orchestra versions of Villa-Lobos's *Bachianas Brasileiras No. 9*, leading to the comparison of four recorded performances. The intent of this study is neither to judge the value of existing performances of *Bachianas Brasileiras No. 9,* nor to prescribe its correct interpretation. Rather, it aims at gaining insight into the process of translating the printed score into sound.

CHAPTER I

CONSIDERATIONS ON INTERPRETATIVE ANALYSIS

> Some questions of interpretation are easily resolved by 'analysis' of one form or another. When they are not, it may be that the analysis is poor, but it is equally possible that the performer is asking ill-considered questions.[5]

During the time I was a student of Rudolf Kolisch, I had the privilege to witness his devotion to the score as the "Holy Grail" of composer's intentions.[6] Kolisch believed that an exhaustive examination of the signs in the score could retrace the composer's thought process. Harmonic structure, for instance, was examined in conjunction with articulation, dynamics, and character indications. He believed that all notation signs had definite meanings. A *piano dolce*, for example, had to be noticeably different from a *piano espressivo*, and the difference had to be perceptible throughout the performance. Phrasing indications and articulations were regarded in the same hierarchical level as pitches. Likewise, timing implication of accents and dynamics were carefully designed.

Jonathan Dunsby relates this approach to performance to the musical idealism of the Second Viennese School. [7] He quotes Kolisch as saying that the study of a score

> has to reach much further than usual structural analysis. It has to penetrate so deeply, that we are finally able to retrace every thought process of the

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5 Jonathan Dunsby, *Guest Editorial: Performance and Analysis of Music* Music Analysis 8:1-2, (1989) : 7.

6 I was in Kolisch's Theory of Performance Class during the 1972-73 Year at The New England Conservatory of Music in Boston, Ma. The views attributed to Kolisch in this essay are my recollection of his teachings. They are my views about his ideas; therefore any errors are mine.

7 Dunsby, "Guest Editorial," 7.

> composer. Only such a thorough examination will enable us to read the signs to their full extent and meaning and to define the objective performance elements, especially those referring to phrasing, punctuation and inflection, the speech like elements. [8]

An idealist in regard to musical conception, Kolisch's approach was, nevertheless, that of a performer. He looked at the score with the intent of imagining how signs and structure could be transformed into sound as a means to retrace the composer's thought. One could also say that he used the signs to stimulate his own ideas to solve problems. Under his guidance, the process of preparation of a work for performance could be lengthy—sometimes over a year.

Dunsby believes that times have changed. Decisions on matters of performance have to be made to accommodate the acoustics of a hall, or the needs of a recording studio. Therefore, "the performer needs some mediation between the spiritual and the actual, without undermining either".[9]

I believe that Kolisch's theory of performance was an attempt to do just that. His lofty ideals were rooted in his performance experiences in collaboration with composers such as Bartok and Schoenberg. I believe that the underlining thought in his approach was that performers' limitations or habits should not get in the way of an ideal conception of the work. Hence, his emphasis on *a priori* analysis was an attempt to minimize the influence of technical limitations on the musical conception. The rigor of his analytical approach was a departing point for performances. Establishing idealistic principles for performance can be seen as dogmatic; but as guidelines they help the performer face artistic issues squarely, thereby facilitating performance decisions.

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[8] Dunsby, "Guest Editorial," 6.

[9] Dunsby, "Guest Editorial," 7.

Present day performers trying to reconcile idealism with pragmatic demands face many problems.

Dunsby says that

> one can only recommend working as positively as possible in the post-idealistic environment. It seems to follow that the most helpful way to characterize analysis for the performer, which is bound to be at the very least Schenker-influenced, is not as some form of absolute good, but as a problem-solving activity.[10]

I would not deny the importance of Schenkerian ideas for understanding music, but I would not go so far as to affirm that analysis for performance "is bound to be at the very least Schenker-influenced". Dunsby fails to consider that from a performer's point of view, other approaches may bring out elements of a work that are more relevant for its performance. Recognizing folk song origins of compositional materials, for instance, may be more pertinent to project the character of a piece in performance than to determine where its structural dominant occurs. The recognition of thematic and motivic elaborations can be very useful in deciding articulation and textural balance. Furthermore, a great number of pieces do not lend themselves to the Schenkerian approach.

I believe that Kolisch considered his model of analysis for performance to be a "problem-solving activity". Musical idealists believe in one correct performance. Hence, Kolisch proposed that thorough examination of the signs in the score allied with structural analysis would lead to the right solution for performance.

It is a misconception to think that Kolisch's ideals were a form of "absolute good" as Dunsby's reference implies. Kolisch's goal was that a performance should sound free

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10 Dunsby, "Guest Editorial," 8.

and expressive and, at the same time, be true to the score. He had a contempt for decisions not based on the evidence found in the score. He believed it to be the performer's duty to learn how to read the score in order to gather all available evidence before making decisions. In other words, the burden was on the performer who must learn how to reconcile instinct—which he believed was often wrong—and the score. The performer must learn to read what information is in the score before assuming it has to be changed. [11]

Dunsby addresses the problem of notation saying that

> [in post-idealistic times]. . . the reality is different, if only because musical notation itself, in skilled compositional hands, is so economical with the truth, but in general because of the inescapable halo of historical contingency in the playing, singing or conducting of other people's music. [12]

The limitations of the signs of musical notation are a given. Here, Dunsby attributes the impossibility of reaching analytical conclusions, at all times, to the shortcomings of notation. Kolisch, on the contrary, maintained that these shortcomings were due to poor reading skills. I believe that when Kolisch says musicians should go "beyond structural analysis" he is actually exhorting us to improve our score reading beyond cataloguing all the signs and fitting the piece into a "form". Taken in isolation, musical notation signs are indeed simple; when used in the context of a composition, they are hardly "economical with truth".

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[11] A favorite teaching device of his was to analyze a score during several classes. When a performance conception was formed in our minds, he proceeded to play a recording, not naming the performers. Needless to say that when asked for our opinions, these performances were invariably found "wrong" in all accounts. After the class finished its devastating critique he would tell us who the famous artists were. This teaching approach is a good example of an idealist at work. He really believed that those performances were just wrong. Today, we would look for alternative explanations to understand the performers decisions.

[12] Dunsby, "Guest Editorial," 7.

The meaning of signs, musical or otherwise, is not the subject of this discussion. Nevertheless, by way of explanation, let us relate the learning of signs with the learning of a foreign language. For a native speaker, the words of a language have multiple meanings that are difficult to grasp for a foreigner. In the same way, a talented and skilled musician may see hidden meanings in a score. That is why performances from the same score can yield so many different results.

Nicholas Cook, tells us that "Schenker did not see himself as explaining how the average listener experienced music; in fact he was dismissive of the average person's abilities to appreciate music at any serious level at all".[13] One could say that Kolisch thought that skillful score reading was beyond the grasp of the average musician. His goal was to teach students how to read a score, how to ask questions that would clarify the meaning of the signs, and how to transfer the musical idea into sound. I would say, paraphrasing Dunsby, that good score reading may clarify most questions; when it does fail, it may well be that we are at fault, not the score.

Kolisch did not think that following, to the letter, all the instructions contained in a score would ensure its correct performance. He did postulate that, by way of a thorough examination of the score, an ideal performance could be conceived in one's mind. Performance then, was the fulfillment of that ideal within very narrow limits. For instance, if the ideal tempo for a *presto* was determined to be ♩ = 144, and the performer's technique only allowed a performance at ♩ = 120, his advice would be to choose another work. An important point to mention is that Kolisch was equally hard on those aspiring composers who did not notate their ideas correctly. It goes without saying that a poorly written score will raise more questions than any analyst can answer.

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[13] Nicholas Cook, *A Guide to Musical Analysis* (New York: W.W. Norton, 1987) , 220.

Dunsby believes that performers are concerned with much more than the tonal coherence in a piece.[14] He proposes that one way to reconcile the idealistic idea with post-idealistic times, is to realize that "understanding and trying to explain musical structure is not the same kind of activity as understanding and communicating music."[15]

Even though analysts claim that their conclusions are of paramount significance for performers, they do not, as a rule, give performance indications. Their primary goal is to understand the inner workings of compositions. In the words of Dunsby "analysis deals, in general, with the ideology of veneration, the celebration of cultural perfection, the explanation of how things work in music, not of how they don't work quite as well as one might wish."[16]

This position describes a Schenkerian stance. It relies mostly on the analysis of "master pieces" to clarify the concepts of how good music works. It tends to ignore or belittle those pieces that do not fit the theory. Performance analysis, when influenced by such views, have a tendency to be prescriptive and dogmatic. Eugene Narmour, for instance, believes that "from an analytical point of view a given performance may be heard as being either good or bad"[17]

Dunsby suggests that analysis for performers is a problem-solving activity, thus offering a more open-minded alternative. The possibility of different solutions is at least implied. Nevertheless, I do not think that Dunsby is as pragmatic as he would like to

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[14] Dunsby, "Guest Editorial," 14.

[15] Dunsby, "Guest Editorial," 7.

[16] Dunsby, "Guest Editorial," 15.

[17] Eugene Narmour, "On the Relationship of Analytical Theory to Performance and Interpretation.", in *Explorations In Music, The Arts, And Ideas: Essays in Honor of Leonard B. Meyer*, Edited by Eugene Narmour and Ruth A. Solie, FESTSCHRIFT SERIES No. 7 (Stuyvesant: Pandragon Press, 1988) , 318.

sound. His analytical examples are very detailed—as they should be—and his conclusions are very prescriptive.

On the one hand, I believe that if analysis is to have any value for the performer, it should be somewhat prescriptive—at least for the analyst's own use. On the other hand it should also open doors to richer performances, not limit their possibilities.

The conflict of the idealistic and post-idealistic positions, then, seems to be not what the activity of analysis for performance is, but how to use the knowledge thus obtained. The idealistic position maintains that there is one ideal performance and one should strive to get as close as possible to that result. The post-idealistic position claims that due to the limitations of the score, and of the practical aspects of performance, one has to solve the problems as they arise.

In a more radical position, John Rink has argued against the validity of the idealistic practice of analysing prior to performing. He proposes that

> a more propitious transfer of procedural and evaluative criteria from one of these musical activities to the other might be accomplished in the opposite direction, that is, from performance to analysis, whereby the fundamental aims and approaches implicit in performing a piece were established as part of one's analytical premise in studying that work.[18]

Rink says that performers aim at ever more 'musical' performances and proposes that if the same criteria were applied to analysis the results would be "more 'musical', analytical observations and conclusions." [19]

As seen above, no one argues the relevance of knowledge in molding a performance. What has been argued is the type of data that helps performers achieve expressive and effective performances.

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[18] Rink, "Review of *Musical Structure*," 321.

[19] Rink, "Review of *Musical Structure*," 322.

Cook considers the issue from the point of view of the listener, and says that

> we expect an analysis to tell us something about the way we experience music: we judge whether it is good or bad according to whether it seems true to experience or not, and the objection to old-fashioned harmonic and formal labeling was precisely that they were not true to experience.[20]

Authors trying to understand how to bridge the gap between what analysts think 'should be heard' and what performers offer to the listeners have turned to recording analysis. The approaches and methods to recording comparison are discussed in the following chapter.

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20 Cook, 219.

CHAPTER II

RECORDING COMPARISON: SELECTED APPROACHES

Listening to recordings as part of a performer's preparation is not unusual. On the contrary, it is a widespread practice. I once heard a renowned piano teacher say: "I tell my students to listen to as many recordings of a piece as they can, and copy what they like most in each one; this way their performances will be original." I am sure that this teacher guided students beyond the mere assembling of a "Rubinstein" ritardando followed by a "Horowitz" fermata—neither one to be found in the score. Nevertheless, this teacher's remarks do illustrate a common method of recording comparison. At the present time, scholars are looking into several alternatives to this simplistic approach.

The philosopher Peter Kivy, writing about the individual features of each performance says:

> We know, however, that there are many differences other than those of dynamics between a performance by Casals and one by Janigro, a performance by Serkin and one by Horowitz, a performance by Toscanini and one by Bernstein: differences in note grouping, in phrasing, in breathing, in articulation, in rest value, in note value. [21]

These differences are the essence of what we perceive as unique interpretations. Performers listen to recordings to learn how other musicians, interpreting the same score, arrive at distinctive interpretations. If these statements are true, then why not copy the unique features in the interpretations of different artists and assemble them to create an "original" performance?

Peter Kivy, discussing authenticity and the art of performance, has eloquently

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[21] Peter Kivy, *Authenticities* (Ithaca: Cornell University Press, 1995) , 133.

answered that a performance as artwork must emanate,

> as a direct "extension" (so to say) of the artist's own personality, rather than a derivative imitation of some other artist's work. And . . . only through such personal authenticity can the artist achieve two of the most admired qualities of works of art: *style* and *originality*. If an artist. . . is true to her own values and tastes and aesthetic intuitions, [and] . . . her values and tastes and intuitions are interesting and viable ones, her works may turn out to have an individual, unmistakable style all their own, and be original ones as well. But if she slavishly *follows the works of others, whatever other admirable qualities her artworks might have, their style will be derivative, and they will be unoriginal works*. [Italics added][22]

If we accept Kivy's position—copying will produce nothing more than derivative art—why should performers listen to recordings? What can performers learn from recordings that cannot be learned from score analysis?

This leads us to questions such as: What is a score? What data is encoded in a score? Is the score a prescription for one true performance or the recipe for multiple versions?

Cook answer's the first of these questions saying that:

> the score of a piece of music, then, is in no sense a direct representation of its musical sound but rather combines certain characteristics of the musical stimulus with those of the listener' s response, and combines them in a quite informal manner.[23]

Cook's discussion of the score includes the listener's response. If a score conveys "certain characteristics of musical stimulus" to the listener, recordings as a medium function in a similar way. The issue here is not whether the listener likes the interpretation of an artist better than another; rather, what interests us is that recordings—which are also a "representation of the musical sound" of a work—can be a complementary tool in score reading. Cook questions the true value of information one

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22 Ibid. , 123.

23 Nicholas Cook, *Musical Analysis and the Listener* (New York: Garland, 1989) , 154.

can gather from texts. For him scores are

> not an objective representation of musical data. On the one hand they cannot be related to the physical sound of music except by means of some kind of contextual analysis involving psychological attributions of pitch; but on the other hand they are no more than an approximate guide to the judgments of pitch performers and listeners actually make, so that the deductive analysis of a score probably reveals more about the properties of notation than the particular music in question.[24]

If, on the one hand, scores offer only an approximate guide to pitch and rhythm, recordings, on the other hand, offer a fixed source for study of how these parameters are performed. For example, one can learn more about Heifetz's approach to issues of intonation and timing from his recordings than from his personal scores.

The possibilities for recording studies are enlarged when we consider other musical parameters. For Cook,

> when a composer writes down music he is relying heavily on the reader's musical ear and imagination in supplying the precise intervallic, rhythmic and dynamic values that the notation omits, just as he has to contribute sonorous, dramatic and emotional values that cannot possibly be specified in the score."[25]

In order to detect and comprehend the subtle differences in score reading described by Kivy, performers need guidelines to direct the study of recordings. Recording comparisons will not provide definitive answers—unless used as models for copy—but they can offer valuable support for understanding the changes of taste across time, or to understand what performance traits make up the individual style of a great performer. Understanding what makes one performer "original" can help another performer shape his/her "values and tastes and aesthetic intuitions", which in turn will lead to an individual style.

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[24] Ibid. , 207.

[25] Ibid. ,.227.

The growing number of scholars dealing with recording comparison indicates that there is, indeed, a wealth of knowledge to be gained through this venue. Their writings are not just critiques for recording magazines. Recording analysts explore many issues such as: Who benefits from these studies? Is a composer's choice of tempo in a recording of his/her own music as binding as the notes in the score? What are the changes in conducting styles? Is the erratic rhythm in early recordings due to careless playing, or was it a convention of style that sounds "wrong" if compared to our present day standards?

Some of the ideas and methods discussed by selected scholars are summarized in the following pages. Their approaches cover a large spectrum of possible research topics from a variety of view points. Their thoughts and procedures provided the incentive for the recording comparison of Villa-Lobos's *Bachianas Brasileiras No. 9*.

José Bowen

José Bowen has written extensively on the subject of performance analysis. In the article *Performance Practice versus Performance Analysis: Why should Performers Study Performance?*, [26] he considers the differences between performance practice studies and performance analysis. For him, the former is concerned with the study of repertoire for which there is no recorded evidence, while the latter concentrates on the study of recordings. Even though early recordings, due to their poor sound quality, offer unreliable data as to how performers did in fact sound, Bowen believes that one should not ignore their existence when researching past practices.

Twentieth-century performance practice researchers have used recordings to trace changes in performance style as well as changes in the interpretation of a particular work

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[26] José Bowen, "Performance Practice versus Performance Analysis: Why should Performers Study Performance?", *Performance Practice Review*, Vol. 9-1(1996) , 16-35.

over a period of time. Recordings of composers performing their own works have served as supplementary sources for critical editions. In Bowen's view, performance analysis is much more complex as " it includes the study of how the music sounds, but it also considers performance attitudes, gesture, social context, and audience response."[27] He suggests that recording studies should be both horizontal—comparison of recordings made in the same time period, and vertical—comparison of recordings made in different time periods.

For Bowen, it is difficult to evaluate the unique aspects of a performance because many decisions are influenced by conventions of style and traditions, not by individual choice. A performer's decision to move an *a tempo* to an earlier or later point than indicated, for instance, might be based either on multiple interpretative options or dictated by tradition.

The focus of mainstream performance practice research has been the study of styles, periods and geographic regions. The great number of recordings available in recent times, has made it possible to study individual interpretations and specific performance traditions, which would otherwise be impossible. While performance practice studies have been the field of musicologists and historically-minded performers, performance analysis studies have been conducted by theorists and psychologists. Bowen states that while psychologists focus on "what a performer can do and why they do it, many theorists (and musicologists) want to tell performers what they should do."[28]

Later he says that: the performance practice musicologist

> often concentrates on period style and not on oral traditions associated with specific works . . .[and] when we discuss works, we usually only discuss the score. We rarely look at performance practice, much less the

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[27] Bowen, "Performance Practice," 19.

[28] Bowen, "Performance Practice," 24.

> performance culture which surrounded the creation of a new bit of musical sound. We usually consider performance practice a separate subject from the discussion of the work and thus our very methodology tends to undercut the position we want performers to take, namely that performance practice matters.[29]

For Bowen, theorists are "more honest about the subservience of performance to analysis." In their studies, performances are considered "good" only if in agreement with the analysis. In spite of the proliferation of historically-informed performances, studies of performance practices and performance analysis have been of a restrictive nature. Such studies have "attempted (and in some cases succeeded) to limit the possibilities for performers."[30]

Bowen believes that performers should not study performance to learn the "correct" way to play and that musicologists have to meet performers half way. He proposes that research should focus more on performance practices and less on the text; in other words, on what contemporaries of a work valued as beautiful playing rather than on early editions and ornamentation rules. He addresses the question of period styles with an analogy to the accent that characterizes the language in a particular region, or which identifies the foreigner. In the same manner that we regard our own accent as natural (it is the others' that sound different to our ears), the performances of our time sound natural while early ones show an accent. By studying texts, we cannot definitively know what particular "accent" would have colored a performance, but early recordings offer a variety of accents for comparison.

Continuing with the language analogy, Bowen reminds us that learning a new language opens doors in both directions. One learns that there are alternative ways of expressing ideas.

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[29] Bowen, "Performance Practice," 25.

[30] Bowen, "Performance Practice," 26.

In performance it means that some of the rules of performance style of our times should be re-evaluated. He mentions tempo fluctuation as an example of a parameter that has been off limits in recent times. He encourages experimentation with early styles of performance as a way to learn a new "accent". For instance, one should not discourage performers from speeding up as the music gets loud, just because it contradicts today's "accent".

Commenting on the current state of affairs he says that the irony of the situation

> is that while we have insisted that some performance practices (like the proper instruments, ornamentation, rhythmic structure, pitch, and tuning systems) are essential for the music to be fully understood, we have equally insisted that other (equally historically accurate) performance practices like flexibility of tempo, re-orchestration, portamento, singing in the singer's language, adding octave doublings and interchanging movements) are bad and distort the music.[31]

For Bowen, performance style is a guide that determines the space allowed for individual expression in a given period. Today's performers are the first to have a variety of styles at their disposal. In previous times they played in the current style molding expression to their own taste. He concludes affirming that, mimicking the accent is not sufficient to become an actor in a foreign language; likewise, one must understand the conventions of expressions of a period before imitating its performance style. Therefore, the researcher should "convey to performers what nuances were historically available in different styles and why", while performers should "demonstrate how the conventions of style and tradition make space for further expressive freedom."[32]

In another article, José Bowen discusses the difference in approaches between ethnomusicologists and music critics on the one side, and musicologists and theorists on

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[31] Bowen, "Performance Practice," 33.

[32] Bowen, "Performance Practice," 35.

the other. While the former study the difference between performances of a same work, the latter concentrate on the score.

He states that:

> a performance is an example of a musical work while a score is either a crude translated sample (a transcription of a single performance in all of its particularity) or a summary (a unique and personal attempt by the summarizer to establish certain essential qualities for an idealized performance) of the musical work. At best, a score is only a spatial representation of *some* [italics in original] of the elements of the temporal phenomenon we call music. [33]

He continues saying that the difficulty in studying performance, as opposed to scores, is that the qualities that distinguish one from another are not fixed or tangible. Hence, the fear of falling prey to subjectivism has kept research attached to scores. Nevertheless, even though the differences between performances might seem to be "entirely intangible, it is in fact possible to identify and analyze some of these differences."[34] Elements such as: tempo, tempo modulation, duration, proportion, and flexibility can be quantified in numbers for comparison. This does not mean that the less measurable features of performance should not be studied.

Historical trends in tempo

Bowen suggests that studies of historical trends in tempo can substantiate or rebut the contradictory claims regarding tempos made in the past. The goals of such studies should be to determine if tempo changes did in fact occur over time. Whether these changes are for better or worse is not a matter of historical judgment, but of aesthetic evaluation.

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[33] José Bowen, "Tempo, Duration, and Flexibility: Techniques in the Analysis of Performance", *The Journal of Musicological Research,* Vol. XVI/2 (1996) , 111-156.

[34] Bowen, "Tempo, Duration, and Flexibility," 112.

While one can argue endlessly if composers' tempos are the best, one can objectively measure whether other performances are faster or slower.

He mentions two main trends regarding conductors' opinions toward tempo and tempo modulation. Those considering that fast and steady tempos "let the music speak for itself" (Mendelssohn, Toscanini, Norrington) and those that "breathed life" into the music (Wagner, Furtwängler, Walter). Nevertheless, he observes that all performers at all times believe they are "transforming scores into sound in the most "natural" or "authentic" way."[35]

The study of performance tempos across decades of recordings allows an insight into whether performances are getting faster or slower. Other possibilities for study include, tempo in studio versus live-performance recordings, the collaboration of a soloist with different conductors or orchestras, or changes in chamber music partners. These studies of performance styles have to account for a number of factors. A soloist with varying tempos in recordings made at different times, for instance, might be adjusting to a conductor, to the style of a decade or to his own age. These factors have to be considered together, in order to recognize the changes of individual, geographic, historical and institutional styles.

Tempo and duration

The relationship of tempo and duration is more complex than the logical assertion that a slower tempo will yield a longer performance, and a faster tempo a shorter one. Bowen organized a study of a large number of works recorded by different conductors. He projected the duration of the performances and had them compared to actual performance time. In order to determine the initial tempo he examined each piece, taking

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[35] Bowen, "Tempo, Duration, and Flexibility," 113.

into account that fermatas and section changes relate to the overall duration and not to the initial tempo. Hence, the initial tempo will not be that of the opening measures for all pieces. Mahler's Fourth Symphony is given as an example. The initial tempo, which starts in measure four, is performed with varying tempos and relates to overall duration. While one would expect that performances starting with a faster tempo would be shorter, the results show otherwise. Bowen reports that conductors using a faster initial tempo can actually have longer performances.

Another facet of his study is the comparison of projected duration versus actual duration. Bowen compares the first 50 measures in the second movement of Beethoven's Fifth Symphony in six distinct performances. Since there are no indications of tempo changes in these fifty measures, he anticipated that all performances would be slightly longer than the projected duration, allowing for slight ritardandos to end phrases. The results showed that four of the conductors followed this model (Harnoncourt, Hogwood, Mehta and Solti). Masur ended ahead of the expected time, while Norrington was the only one to finish on time. For Bowen this means that "duration is clearly not simply the inverse of tempo; internal fluctuation is a crucial factor."[36]

Duration and proportion

The question of proportion between movements of a large work has been the subject of many discussions. For Bowen, proportion is related to duration and not to tempo. In multiple-section works the average tempo has no meaning; it is proportion between sections that will yield relevant data. He bases his study on the first movement of Tschaikovsky's Symphony No. 6. He compares the proportion of sections in different performances by measuring the duration of each section. The analysis of his data shows

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[36] Bowen, "Tempo, Duration, and Flexibility," 121.

that “despite the variety of tempos, all of the conductors ultimately produce performances of similar proportions”[37] He proceeds to compare the proportions of the projected durations based on the metronome indications in the first edition. Finding that “despite their wide differences in tempo and total duration, the real performances correspond very closely to the proportions implied by the metronome marks.”[38]

He concludes that proportions should not be inferred from tempos but measured directly. Furthermore, "measuring tempo to discuss proportion and vice versa are flawed techniques.”[39]

Tempo tolerance

Bowen states that even though tempo changes do not alter proportions, they do affect our perception of a work. A change in tempo may actually have a greater impact on the listener than a change of proportions. In spite of the prescriptive rhetoric of recent musicologists advocating that only the return to “authentic” tempos restore a work, the evidence supports that there is a cultural “tempo tolerance”. Furthermore, this tolerance can be measured for each work within a determined period or culture. The question is how much tempo alteration is allowed before it becomes unacceptable.

Performers are always innovative and while some of their new ideas are accepted others are rejected. For this reason, “it is ultimately audiences who determine whether a performance at a new tempo is still a performance of the work.”[40] The tempo tolerance of our century is 30%. That is to say, for instance, that we accept performances of the

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[37] Bowen, “Tempo, Duration, and Flexibility,” 124.

[38] Bowen, “Tempo, Duration, and Flexibility,” 124.

[39] Bowen, “Tempo, Duration, and Flexibility,” 125.

[40] Bowen, “Tempo, Duration, and Flexibility,” 128.

second movement of Beethoven's Fifth Symphony at tempos ranging from 60 to 85 beats per minute.

Bowen uses computer generated graphs to show tempo maps. These maps display tempo fluctuations and can be used to check the accuracy of critic's descriptions of conducting styles. For instance, contrary to widespread belief, Toscanini's performances are full of tempo fluctuations and accelerandos in closing sections. The maps also show that all pre-Karajan conductors used tempo to delineate structure, confirming the tradition of slower tempos for second themes, and faster tempos for transitions and closing sections.

Tempo flexibility

For Bowen, there are "two possible sorts of tempo flexibility: dramatic section shifts (large-scale flexibility) and tempo variation within a single section (small-scale flexibility) . . .." [41] As an example of large scale flexibility he offers the exposition of the first movement of Beethoven's Fifth Symphony. According to his comparison, the average duration of the first and last sections of the exposition have not changed over time. However, because the tradition of slowing down for the second theme is no longer fashionable, the overall duration of the exposition has been shortened. For him, the faster tempo for the second theme indicates a loss of large-scale flexibility. A study of the first movement of Tschaikovsky's Sixth Symphony provides the examples for small-scale flexibility. In this study, Bowen uses the computer generated maps to compare not only "the average tempo per bar but the actual time from beat to beat."[42] His findings show, for instance, that Mangelberg used an increase and then a decrease of tempo to shape

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41 Bowen, "Tempo, Duration, and Flexibility," 134.

42 Bowen, "Tempo, Duration, and Flexibility," 137.

each eight bar phrase, while Muti favors extreme variations between sections but very little flexibility within sections.

Bowen suggests that flexibility (large and small) should be measured by direct comparison of tempo and duration in a single performance. I summarize his procedures as follows:

a) Time the actual performance duration of the section.

b) Calculate the initial tempo for the section by averaging the tempo in its initial measures.

c) Calculate the projected duration of the section dividing the number of beats in the section by its initial tempo (beats per minute).

d) Compare actual and projected durations.

This method measures the degree of flexibility a performer takes in relationship to the initial tempo. Performers deviate from the "metronome line" (projected duration) in both directions. According to Bowen, performances of Beethoven's Fifth Symphony first movement exposition are expected to take longer than the projected time due to fermatas and ritardandos. Therefore, a performance longer than the projected duration will sound more relaxed, while one taking less time will seem compressed.

Plotting the results of various performances against each other permits us to evaluate the degree of flexibility used by different performers. Performances that have a similar degree of flexibility tend to sound alike, but other factors must also be considered. A Mangelberg recording of Beethoven's Fifth Symphony, for instance, falls exactly on the metronome line but is far from being metronomic. It merely balances relaxation with compression. Another interesting example shows that Furtwängler's five recordings of this same work display different durations for each performance. [43]

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[43] Bowen, "Tempo, Duration, and Flexibility," 135.

The study of tempo flexibility can, on the one hand, help in the understanding of past conducting styles. On the other hand, it can be used to understand how one particular piece was shaped through tempo modulation in different decades.

Bowen's states his conclusions about methodology and the nature of data as follows:

> 1. While detailed listening to individual performances is crucial, historical investigations of performance traditions must use data sets as large as possible .
>
> 2. Tempo and duration are only generally inversely related so duration and durational proportions should be measured directly.
>
> 3. Tempo data should be measured in the most accurate way possible and on the smallest level. While there is human error in the method related here, it is not cumulative, and accuracy of averages increases with the number of data points.
>
> 4. There are two, perhaps three, unrelated levels of flexibility: sectional, phrase, and bar. Sectional or large-scale flexibility alters the tempo of an extended passage like a second subject. Small-scale flexibility involves smaller adjustments that take place either on the phrase or the bar level.
>
> 5. These levels of flexibility can and do change independently; a reduction in the use of small-scale flexibility may or may not be accompanied by a change in the use of large-scale flexibility.
>
> 6. Tempo tolerance (the amount of fluctuation in the average tempo tolerated in a musical culture or period) should be measured and not prescribed .[44]

Some of his conclusions of historic and cultural significance are that:

Even conductors considered to be "improvisatory", maintained a single conception of a work throughout their careers. Conductors in the second half of the century tend to sound more alike. Period style seems to be stronger than ideology (i.e., both Toscanini and Furtwängler, despite opposing rhetoric, used great flexibility). Shifts in performance practice affect how a work is "heard, received and interpreted"; therefore,

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[44] Bowen, "Tempo, Duration, and Flexibility," 145-48.

discussions about works and performance must not be compartmentalized. He suggests that future studies should look at all manifestations of style (geographical, individual, institutional etc.), as well as the traditions associated with individual works.

Eugene Narmour

Eugen Narmour, Professor of music at the University of Pennsylvania, has written several books and essays on music analysis and its relationship to performance. His position, that of a music theorist, contrasts sharply to Bowen's. The essay *On The Relationship of Analytical Theory to Performance and Interpretation,*[45] summarized below, offers a view into his approach to performance analysis. He considers that comparing recordings is useful to

> discuss both why from an analytical point of view a given performance may be heard as being either good or bad, and why performing a given passage one way or another makes a significant difference to the listener's experience.[46]

For Narmour, the musical process is dependent on the "triarchical" relationship between composer, performer and listener. Performers, being in the middle, have a duty to composers and listeners. For this reason, performers must not only understand the aesthetic demands of composers, but also place themselves in the listener's place before making musical decisions. He proposes that performers should ask themselves: "what are the implications of this passage *for the listener* [italics in original] if I perform the music like this? What perceptually follows from my presenting these notes in this particular way as opposed to another special way?"[47]

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[45] Narmour, Ibid. , 317-40.

[46] Ibid., 318.

[47] Ibid.

Contrary to Bowen's position, that aims at understanding tastes and individual performance styles, Narmour is prescriptive and judgmental. For instance, Katchen's performance of Brahms's *Intermezzo* op. 118 No. 1, is found unacceptable; because it does not bring out motivic relationships found in Narmour's analysis. He concludes that "Katchen's performance lacks analytical insight and therefore perceptual consistency."[48] Is the performance really at fault, or does Katchen's analysis differ from his? Narmour does not even consider the possibility that, for Katchen, there might be other features worth bringing out.

Reading on, one doubts that any performance can live up to Narmour's analytical observations. For instance, he considers Glenn Gould's performance of the first measures of the aforementioned Brahms's *Intermezzo* as acceptable, but concludes that "Gould ruins the form in other ways: by ignoring the repetition of the phrase he throws the form all out of proportion."[49]

Narmour's "right or wrong" approach minimizes the benefit of his comparisons. Nevertheless, some of his findings are very interesting. In other words, his observations are relevant, it is his close-minded stance that undermines his conclusions. His remarks on the role of closure in music, for instance, clarify the inter-relationship of parameters. He asserts that:

> 1. For the listener, structure is a result of closure.
>
> 2. Closure occurs in various degrees and thus on all levels of music, from low-level motives to the highest levels of musical form. (Indeed, closure is responsible for the emergence of hierarchical levels.)
>
> 3. Each parameter of music—melody, harmony, rhythm, dynamics,

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[48] Ibid., 319.

[49] Ibid., 321.

> tessitura, timbre, tempo, meter, texture, perhaps others—carries with it its own internal means of closure.
>
> 4. Since at any given moment many different parameters are simultaneously operative in music, the closure in one may or may not coincide with the closure in another.[50]

Let us consider each one of these precepts and its applicability to recording comparison:

a) Structure can be projected in performance through emphasis of timing and/or dynamics. Recording comparison can help a performer understand how other performers approach the issue.

b) Excessive attention to motivic relationships and hierarchical levels may result in pedantic performances—an issue that seems to have escaped Narmour's attention. Recording comparison can reveal how performers succeed or fail to find effective solutions.

c) Not all parameters of music are equally relevant to all works. A performer's evaluation of the complex inter-relationships of these parameters will influence performance. A decision as to which parameters affect the performance of a particular work should precede the design of an effective comparison of recordings.

d) Variations on interpretation exist, precisely, because "the closure in one [parameter] may or may not coincide with the closure in another"—another point that seems to have eluded Narmour's argument. Performers will solve closure incongruences in many different ways. I do not contend that all solutions are successful. Nevertheless, performers are perceived as "talented" if they bring persuasive answers to these problems. Determining these parameter-congruence

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[50] Ibid. 326.

problems in a composition and comparing their realization in recordings, may clarify why we, as listeners, perceive performances as varying in degree of musicality.

Narmour also points out that minute changes in note duration, as in rubato or the choice of shorter or longer bow strokes, affect our perception of closure. In other words, if we perceive that leaning on a note intensifies our perception of closure, as in feminine endings, we perceive the performance as correct.[51] He offers the modern—historically "correct"—practice of double dotting in baroque music as an example of how note duration affects our structural perception. For him, the 7:1 ratio of double dotting gives more weight to the structural tones than the 3:1 in the old practice.[52]

He concludes his article with an in-depth study of a short passage from act two of Strauss's *Der Rosenkavalier*. John Rink, in the aforementioned review of Wallace Berry's *Musical Structure and Performance*, contested Narmour's conclusions.[53] For Rink, if one considers his claim "that performers must understand 'theoretically and analytically how function relates to form', it is astonishing that so many good performances have been achieved by musicians who do not 'analyse' as analysts analyse."[54]

I agree with Rink that Narmour's biased stance leads to questionable conclusions but his writings do offer an alternative frame of thought for recording comparison.

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[51] Narmour still employs the term "feminine cadence".

[52] Ibid., 331.

[53] Rink, "Review of *Musical Structure*," 322-23.

[54] Ibid.

David Epstein

David Epstein has devoted two books to the study of time in music: *Beyond Orpheus*: *Studies in musical structure* [55]and *Shaping Time*.[56] An attempt to summarize his conclusions would certainly fail to do justice to the complexity of issues addressed in both works. Nevertheless, his use of recordings to study tempo flexibility and proportion is worth mentioning. While Bowen is concerned with the cultural and aesthetical significance of performance analysis, Epstein studies performances to determine the psychological foundations of performance. Hence, he adopts procedures better suited to his scientific goals. After transferring recording excerpts to magnetic tape he obtains measurements of durations by dividing the length of the tape, for each note or section, by the speed of the tape recorder.

In Epstein's study of tempo,

> neurophysiology has been a premise throughout. The periodic aspect of neurophysiological time clocks, the apparent basis of the periodicity seen in music (the "beat"), is primary. A stable beat not only structures tempos; from it arise[s] the relationships of beat that constitute proportional tempo.
>
> The stable beat is also a factor in rubato. The seemingly free phrasing of rubato is coupled to the periodic grid established by the beat, with the heard phrase departing from that beat and ultimately returning in-phase with it; the process is one of dual, coupled time systems running in parallel.[57]

His study of rubato determined the existence of a predictable cubic curve that controls acceleration and retard. To test his hypothesis he analyzed five performances of Schumann's "Traumerei", with the use of the Yamaha Disklavier. The results indicated that the concert artist performance follows the cubic curve very closely while amateurs

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[55] David Epstein, *Beyond Orpheus: Studies in musical structure* (Cambridge, MA: MIT Press, 1979) .

[56] David Epstein, *Shaping Time* (New York: Schirmer Books, 1995) .

[57] Epstein, *Shaping Time*, 449.

and students deviate in varying degrees.[58] He concludes that:

> The predilection for cubic-shaped curves, also a neural function, appears [to be] the basis for accelerations and ritards. . .. Intrinsic neural latencies of timing imply other, possibly universal, aspects of innateness: competence, performance, giftedness. . .. Questions arise. Is gifted performance, for example, one that most closely adheres to an innately determined model. . .? Or would high gifts stimulate a "playing with," or "around," that model, . . .? Both perspectives may characterize gifted performance. Fidelity to a model, its close realization and correlation, are suggested in the ritard/acceleration study (Demus's performance of "Traumerei"). Rubato, on the other hand, in its gamelike playing with time—occasionally "gambling," taking a chance—and in its multiple, potentially selective or preferred levels of control, suggests the second perspective. [59]

The importance of this study rests on its scientific determination of how performers shape time. Epstein effectively measured the actual time added to or subtracted from a note in performances and its effects on the perception of musical events. He has shown that there is a physiological model that can be represented by a cubic curve. The cubic curve is determined by the performance itself. Therefore, the expectations raised by the performance of one event, determines our perception of subsequent events. Epstein has also shown that tempo modifications that do not follow the cubic curve are perceived as unnatural. [60]

Performers do not have to replicate Epstein's studies to benefit from his findings. His conclusions allow performers to direct their attention to matters of time knowing that there is scientific evidence to support such perceptions. For example, if the performance of an accelerando feels awkward, there is no need to quantify the rate of acceleration to prove it wrong. The purpose of performance is not to follow a cubic curve. Hence,

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[58] Epstein, *Shaping Time*, 443.

[59] Epstein, *Shaping Time*, 449.

[60] Epstein, *Shaping Time*, 440-44.

performers should concentrate in playing what feels natural—knowing that there is a physiological basis for that feeling—and leave measurements to physiologists. This is in no way an apology to the "play as you feel" approach. On the contrary, it demonstrates that if what one feels does not fit the physiological model, it will be perceived as wrong or unmusical. It shows in a tangible way why the thorough knowledge of the tempo relationships indicated on the score leads to natural timing in performance. Here is hard evidence why copying the ritardando of a recording and the accelerando of another will not sound like an original performance.

Bowen has used computer programs, and Epstein has measured the actual length of tape to determine the length of notes. Neither method is readily available to performers. Narmour, on the contrary, relied on his own perception. He mapped the dynamics in the Strauss passage after repeated hearings of the recordings. As for the duration of the notes, he used a digital stopwatch to calculate the average of several measurements taken through headphone listening. He considers that, even if these measurements are not perfect, averaging the results minimizes the errors and is adequate for the purposes of the study.

The advantage of this simple method is its accessibility to performers. As for errors, I believe that multiple readings for each recording, done by the same person on separate occasions, and the averaging of the results will even out possible bias toward a single performance. This method introduces the same 'error' in the measurement of all recordings. As the purpose of the study is to compare the differences in performances rather than to measure absolute data, it is adequate.

CHAPTER III

BACHIANAS BRASILEIRAS NO. 9

STRING AND VOCAL VERSIONS: A COMPARISON

Villa-Lobos wrote the Bachianas Brasileiras No. 9 in two versions, one for voices and another for string orchestra. The composer referred to the chorus for the vocal version as "orquestra de vozes", an orchestra of voices. The piece, dedicated to Aaron Copland, was written in New York in 1945. The date of the premiere of the version for voices is a matter of controversy. On the one hand, Villa-Lobos's long-time friend Adhemar Nóbrega reports that the vocal version received its first performance around April 1945.[61] According to Nóbrega, a renowned Brazilian musicologist, this version was premiered in the Thursday afternoon meetings at the *Conservatório Nacional de Canto Orfeônico* in the city of Rio de Janeiro, Brazil. Simon Wright, on the other hand, lists the premiere of the same version as October 24th 1975. [62] Nóbrega emphasizes the fact that Villa-Lobos initiated and ended the Bachianas cycle with an innovation in the choice of instrumentation—the Bachianas Brasileiras No. 1 is for an orchestra of violoncellos.[63] Nóbrega's remarks indicate that he considers the scoring for voices as the first version. Wright agrees with him and likens Villa-Lobos's *Bachianas Brasileiras No. 9* to Bach's *Art of Fugu*e, due to the abstract character of both works. Wright considers the absence of Brazilian dual titles and the coexistence of both versions as an

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[61] Adhemar Nóbrega, *As Bachianas Brasileiras de Villa Lobos* (Rio de Janeiro: Museu Villa-Lobos 1971) 121.

[62] Simon Wright, *Villa-Lobos* (Oxford: Oxford University Press, 1992) 86.

[63] Villa-Lobos was criticized for applying the term 'orchestra' to a homogeneous group of instruments. Nevertheless, fifteen years separate the first from the last *Bachianas;* his usage of the term to close the series implies that it was a deliberate choice.

indication that this work marks the achievement of "syntactical purity" in Villa-Lobos compositions. [64] He also speculates about the programmatic content in Villa-Lobos's works. For Wright,

> the dominant theme in Villa-Lobos's entire output, that of mankind living and moving in vast, untamed, tropical landscapes, and encountering dangers physical, magical, and spiritual, continued as an undercurrent in his works . . .. The Bachianas themselves are not entirely devoid of this theme, particularly in the dry landscapes of no. 2. . ..[65]

Wright's image of mankind moving through dry landscapes also describes the motionless ambiance of the Prelude's first half. Following his metaphor, one can say that the chorale harnesses the strength of the individual to form a collective society—an idea in keeping with Villa-Lobos's social-political beliefs. The Fugue's rhythmic vitality, and its relentless drive toward the final unison, suggest man's victory over all dangers.[66]

In the preface to his book *As Bachianas Brasileiras*, Nóbrega discusses the theme of "internationalism" vis-à-vis nationalism in Villa-Lobos's works. He points out that, for each one of the *Bachianas Brasileiras*, Villa-Lobos created and developed his own themes. Although these have a distinct national flavor, none are directly extracted from any known folk tunes. Nóbrega links this strategy to the need to transcend the nationalist label which had consistently been attached to the composer. The premiere in the afternoon meetings at the *Conservatório Nacional de Canto Orfeônico* in Rio de Janeiro, as mentioned above, brought the version for voices into a nationalistic, almost domestic, frame. The innovative idea of an orchestra of voices was also a limiting factor for

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64 Ibid. , 98.

65 Simon Wright, Ibid. , 99.

66 My personal scenario for this piece relates to Mário de Andrade's novel *Macunaíma.* Macunaíma, the main character, represents all Brazilians; his story symbolizes the birth of Brazilian culture. A discussion of this idea would demand an exposition beyond the scope of this essay. Nevertheless, I have a strong feeling that the ending on the unison C represents Villa-Lobos's cry of independence from European models represented by the Fugue.

international dissemination. The string version, given its traditional instrumental formation, could be prepared for performance in a short time with professional orchestras around the world. It is not a coincidence that, in 1956, Villa-Lobos recorded this version in France.[67] In this respect one can say that the string version transcends the domestic limitations of the *canto orfeônico* movement and strives to achieve international status.[68]

The scoring of both versions of *Bachianas Brasileiras No. 9* is closely related, yet Villa-Lobos's writing explores the full potential of both ensembles. The orchestra of voices calls for bass, baritone, tenor, alto, mezzo-soprano, and soprano. The string orchestra version employs multiple divisi in all sections. The six-part vocal writing brings about a variety of sonorities and textures. The orchestral treatment given to the voices is highlighted by the use of abstract syllables in lieu of lyrics, as well as the indication to sing with closed mouth (*boca fechada*). The string writing employs idiomatic characteristics such as harmonics, doublings at the octave and double stops which accounts for its full and distinctive sound.

Granted that each one of the two versions generates its own peculiar performance problems, a discussion of the several aspects involved in the re-scoring from voices to strings can be elucidating. The following comparison of the two versions aims at resolving performance issues. The manuscript copies used for this comparison were obtained from the Museu Villa Lobos. The string version is in the composer's hand and the vocal version is F. Paes de Oliveira's copy dated 1971.[69]

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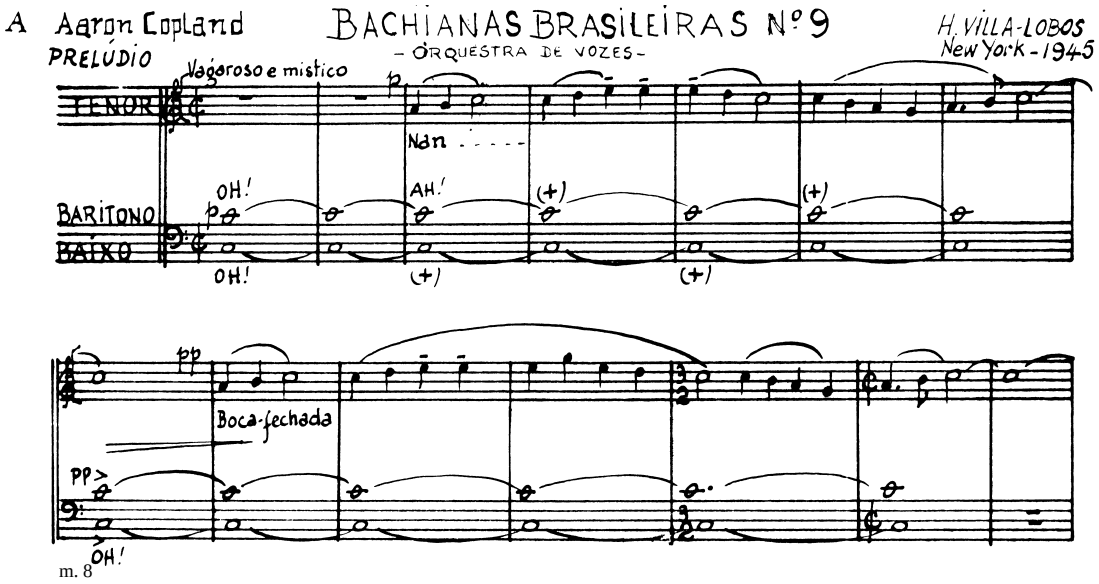
67 *Orchestre National de La Radiodiffusion Française*—EMI 7243 5 66964 2 6

68 A discussion of the "Canto Orfeônico" movement in Brazil is beyond the scope of this essay. Suffices to say that it was a movement infused with patriotic fervor which lasted for over two decades preceding and during World War II. Villa Lobos was the proponent of the idea that brought about the creation of choruses throughout Brazil.

69 The Xeroxed copies obtained from Museu Villa-Lobos are uneven in quality. I opted for using reproductions of these copies when preparing the following examples rather then computer generated ones, in order to remain close to the source.

Prelude

The vocal version, henceforth referred to as **vv**, starts with basses and baritones singing the pitch C in octaves to the syllable "oh" [o][70](Example 1, m.1).[71]



Example 1. *Bachianas Brasileiras No. 9*: vocal version, Prelude mm. 1-14

The string version is henceforth referred to as **sv**. As shown in Example 2, the first chord (m. 1) has its register expanded with the pitch C now encompassing three octaves to which g^4 is added. The explosive eight-note chord, (*m.* 1, first beat) marked *sforzatto*, is an instance of how Villa-Lobos used the idiomatic possibilities of the strings to enrich the score.

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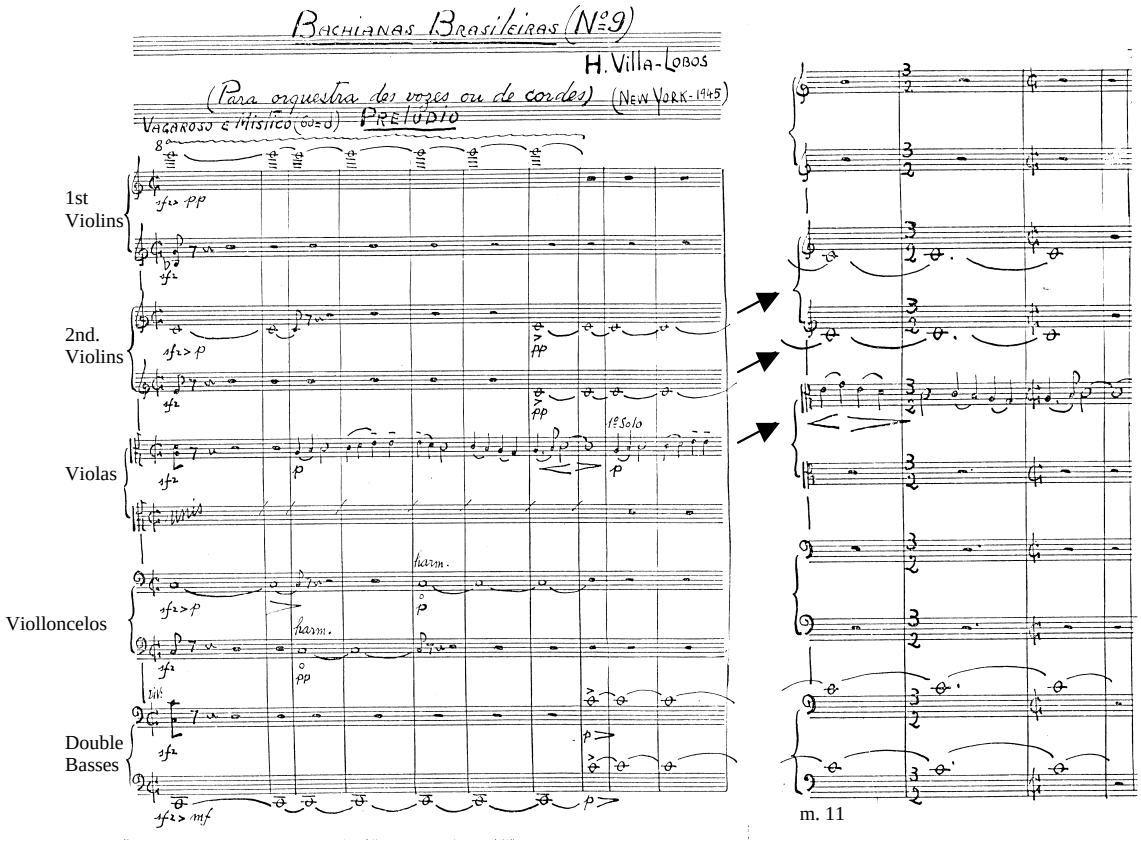
70 Brackets indicate international phonetic pronunciation.

71 The word "pitch" accompanies upper case letters to designate a pitch class in any register. When referring to specific registers, upper case or lower case letters are used in accordance with the system that designates the pitch C two octaves below middle c as " Great C"



Example 2. *Bachianas Brasileiras No. 9*: string version, Prelude mm. 1-14

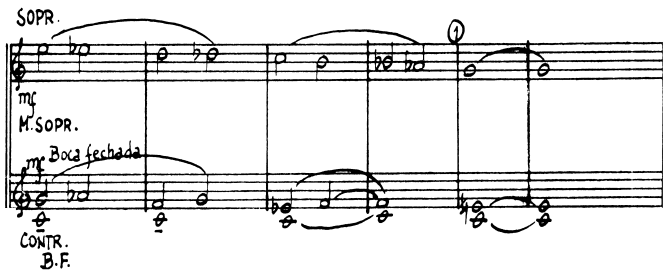
The most distinctive feature common to both versions is that of register expansion. The register extension at the beginning of **vv** is limited to the bass/baritone octave c-c^1. The successive entrances of voices extend the register upward but keep it within the range of the human voices. The orchestration in **sv**, from the very first chord, expands the boundaries of the sound space. In mm. 1-7, g^4 and CC define the extreme registers. The reiterations of the pitch C in different octaves (mm. 5, 7 and 8) bring about

a shifting of sonorities in the manner of a kaleidoscope and contribute to the closing of the registral gap.

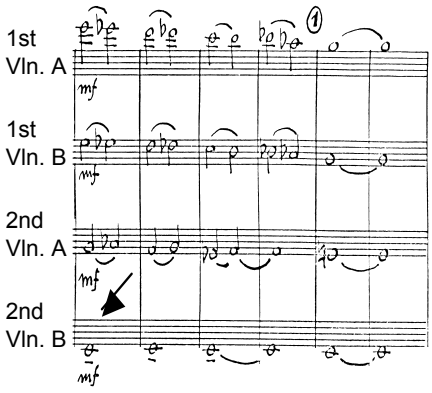
As it can be seen by comparing Example 1 with Example 2, the pitch C is reiterated more times in **sv** than in **vv**. Initially, it appears as an unaccented exchange in the divided violoncellos, m. 2 and m. 5. Later, the second violins reiterate c^1 with an accent in m. 7, and finally, basses leap up from CC to C in m. 8. While in **vv**, the sustained pitch C is articulated with an accent only in m. 8, in **sv** it occurs one measure earlier. The second violin entrance, in m. 7, anticipates the bass change of register in m. 8. The CC-C octave leap in the bass coincides with the sudden termination of the g^4 in the first violin, directing the listener's attention to the solo viola, m. 9. The tenor part in m. 9-14 is marked *boca fechada*, in **sv** it is written for the viola solo.

As shown in Example 3, the first violins doubled at the octave, take the soprano part in measures 15-18.

Vocal Version



m. 15

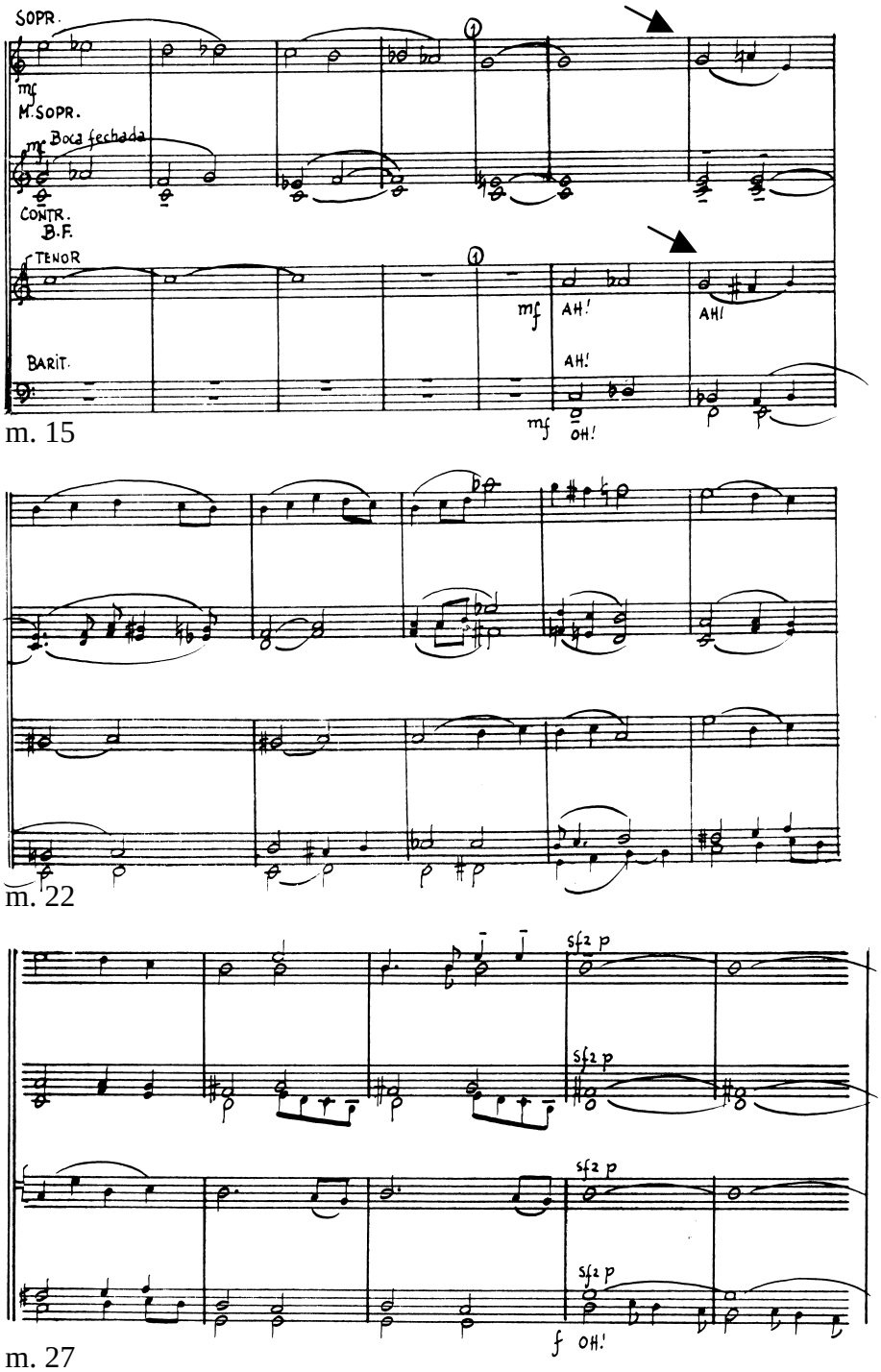


m. 15

Example 3. *Bachianas Brasileiras No. 9*: vocal and string versions, Prelude mm. 15-20

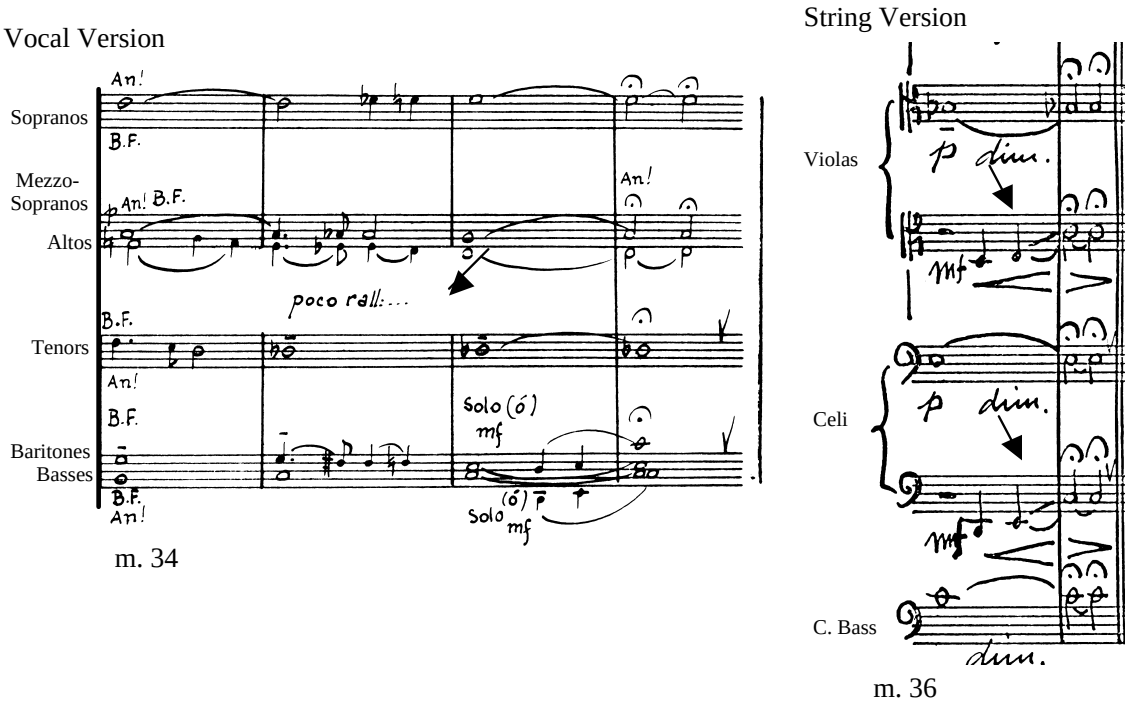
The slurs in mm. 15-18 differ between the two versions, **vv** has the phrase slurred in groups of two bars, while **sv** has one slur for each bar. Discrepancies in slur indications such as these, present throughout the remaining of the prelude, raise questions concerning appropriate bowings. In this particular case, the violins have the option of minimizing the bow changes, trying to imitate the slurs in **vv**, or to follow the inflection implied by their own slurs. A clue for this decision can be found in the second violin lower divisi (Example 3). The reiteration of the pitch C suggests that the upper parts should be inflected in the first two bars in order to articulate the repeated notes and less so in the following two measures. This is one instance of the different performance problems that each medium presents. The human voice naturally inflects the descending minor seconds in mm. 15-18 as a sighing gesture. Articulating each measure in a vocal performance would interrupt the flow of the phrase. In a string rendition, slurring two bars would lead to a continuous line that would obscure the repeated Cs. The choral style of mm. 21-30, on the contrary suggests that the discrepancies of slurs between **vv** an **sv** should be treated as bowing suggestions rather than inflections of articulation (Example 4).

A distinctive feature of the vocal writing is the use of the *boca fechada* effect as the prevalent sonority in the first nineteen measures of the Prelude. Harmonics and *pianissimo* are the composer's choice in **sv**, not the muted strings as one might expect. After the C major cadence in m. 19, Villa-Lobos indicates the vowels "ah" [a] and "oh" [o] as the articulating syllables for the choral passage, mm. 21-30 (Example 4). The first violin octave doublings expand the upper register, conferring to this passage an open sound analogous to the vowel sounds in **vv**. Doublings are used in **sv** either to create an idiomatic string sound or to imitate a vocal effect.



Example 4. *Bachianas Brasileiras No. 9*: vocal version, Prelude mm. 19-31

Example 5 shows that, although printed in two staves from m. 28, the actual viola and violoncello divisi happens only at the final cadence. The divided strings replace the solo voices in **vv**. The *glissando* between the pitches E-C, present in **sv** but not in **vv**, seems to indicate that the ascending minor sixth should emulate a vocal inflection. The syllable "an" [ã] brings to the last four bars of **vv** the dark sonorities of the beginning, (see Example 5 below). The choice of the syllable "ó" [ɣ] for the final bass and baritone *soli*, an exclamation of either surprise or anticipation in Portuguese, is well suited to the character of unfulfilled expectation in which the Prelude ends.



Example 5. *Bachianas Brasileiras No. 9*: vocal and string versions, Prelude final measures

Fugue

An examination of the Fugue in **sv** calls attention to the profuse and, at times, inconsistent divisi for all sections. The divisi scoring reduces the six voices of the chorus into five string parts. As one looks further into the matter it becomes clear that the correspondence of chorus sections to string sections is not strict. As the examples below will show, the tenors are, at times, substituted for cellos and at other times for violas, while second violins or violas, by turns, replace the contraltos or the mezzo-sopranos. Some of these discrepancies can be attributed to haste and lack of revisions.

Michael Round comments on the difficulty to prepare Villa-Lobos's works:

> The simplification of style evident in the *Bachianas Brasileiras* did not in any way alter Villa-Lobos's frequently-reported method of working in which compositions were dashed off in feverish haste (often to the accompaniment of radio, conversation, and other music in the house) and their revision waived in favor of successions of new pieces. The inescapable corollaries - slips *of* the pen, miscalculations of orchestral balance, impracticalities or even impossibilities in passage work, imprecise notation of special effects, uncertainty in specification of the required orchestral forces, and inadvertently inexact reprises - remain to a large extent in the printed scores, despite the *efforts* of a series of intermediate copyists of varying degrees of editorial skill. [72]

The score for the fugue in its string version is clear in terms of voice entrances and hierarchy, but the divisi indications are misleading. As one studies the score in preparation for performance, many decisions have to be made as to the number of players needed in each part—a critical problem with small ensembles. However, a detailed examination of the two version clarifies the correspondence of vocal to string sections, thus helping to decide the allocation of players to the parts.

The soprano part, invariably assigned to the first violins, is written in octave divisi, as at rehearsal [6](Example 6).

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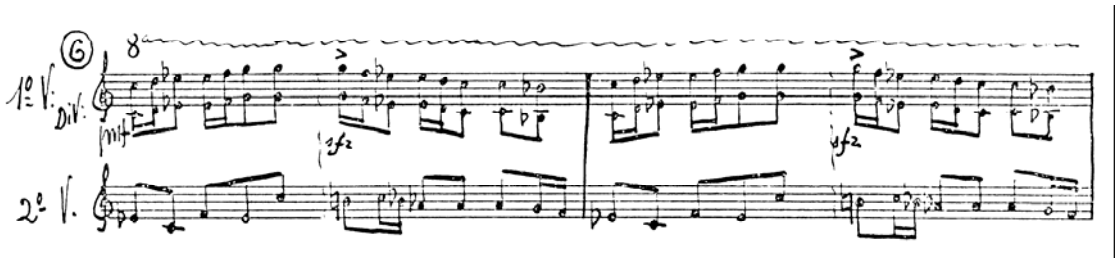
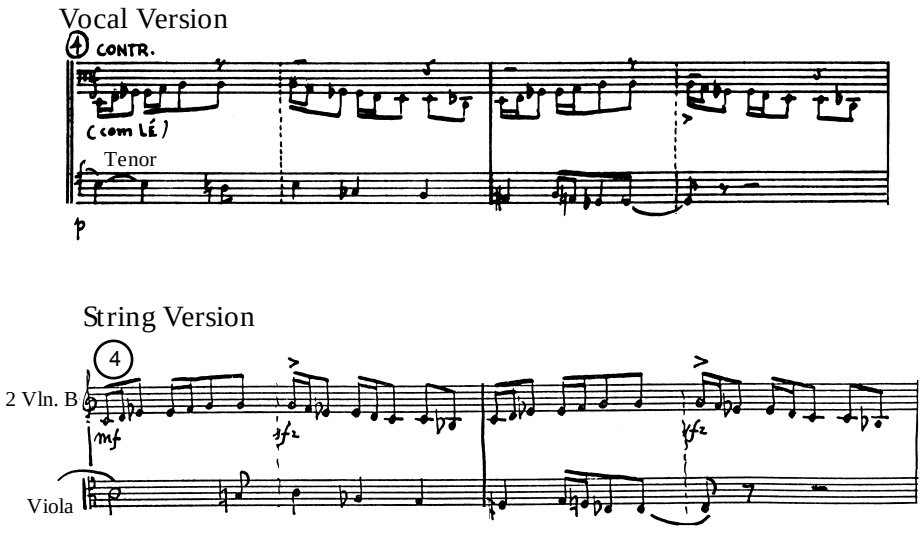
[72] Michael Round, "Bachianas Brasileiras in Performance", *Tempo: A quarterly review of modern music*, Issue 169 (June 1989) 34-41.



Example 6. *Bachianas Brasileiras No. 9*: string version, Fugue rehearsal [6]

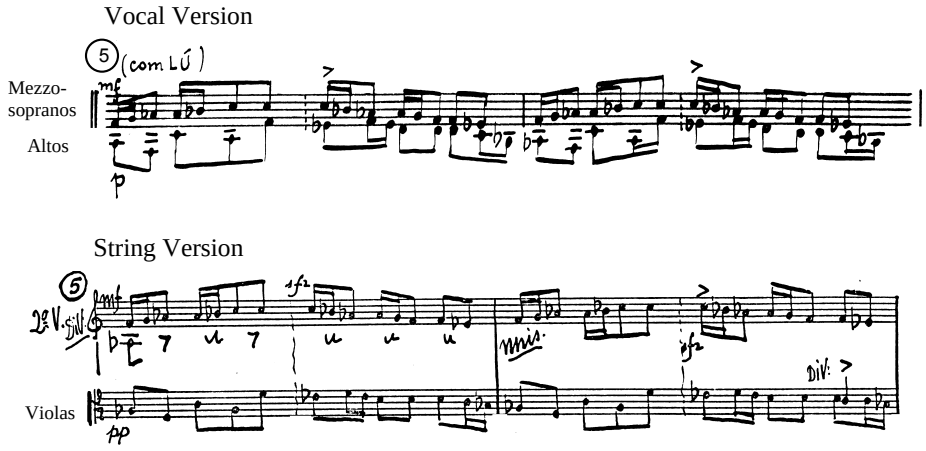
An illustration of the manner in which second violins replace the contraltos occurs at rehearsal [4] (Example 7).



Example 7. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue rehearsal [4]

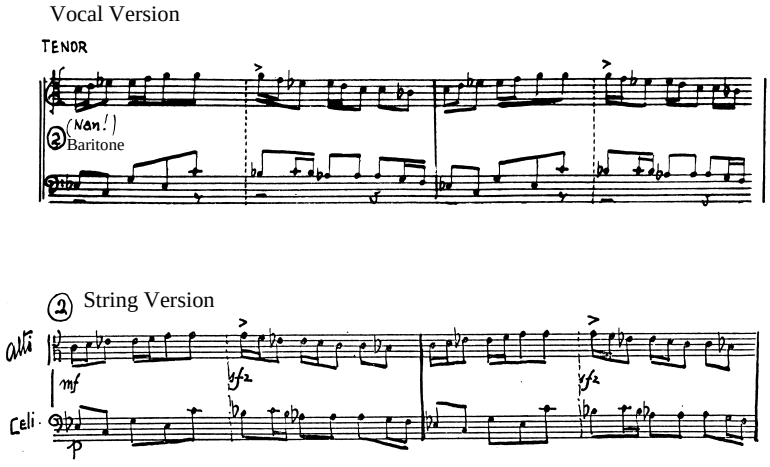
An instance of the variance in correlation of the sections between the two

versions can be seen in Example 8. This time, due to the low tessitura of the passage, the violas take the part of the contraltos.



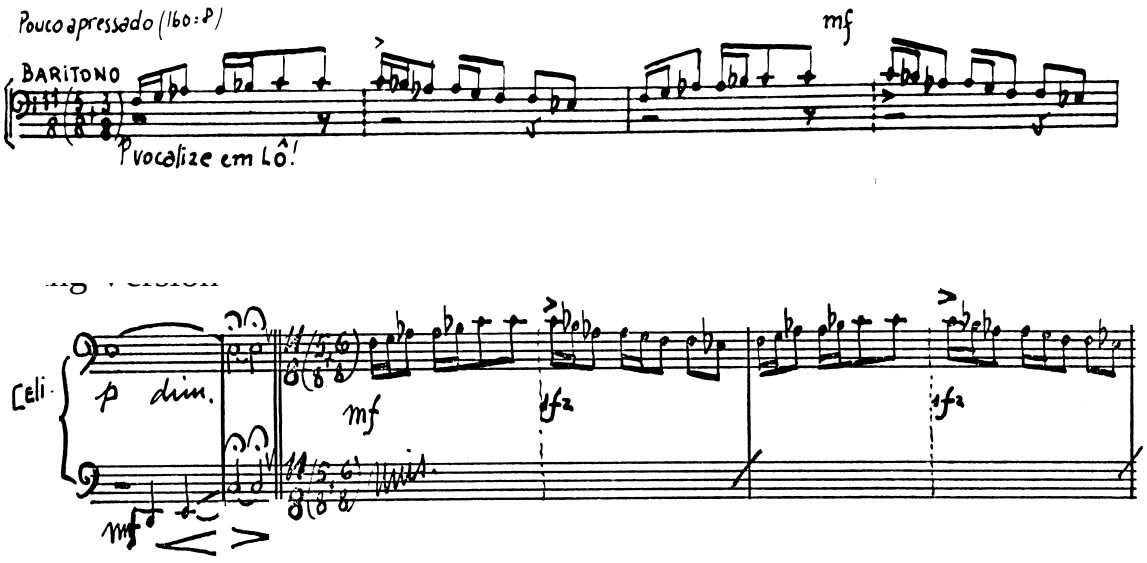
Example 8. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue rehearsal [5]

The violas are also used as substitutes for the tenors, as at rehearsal [2] (Example 9).



Example 9. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue rehearsal [2]

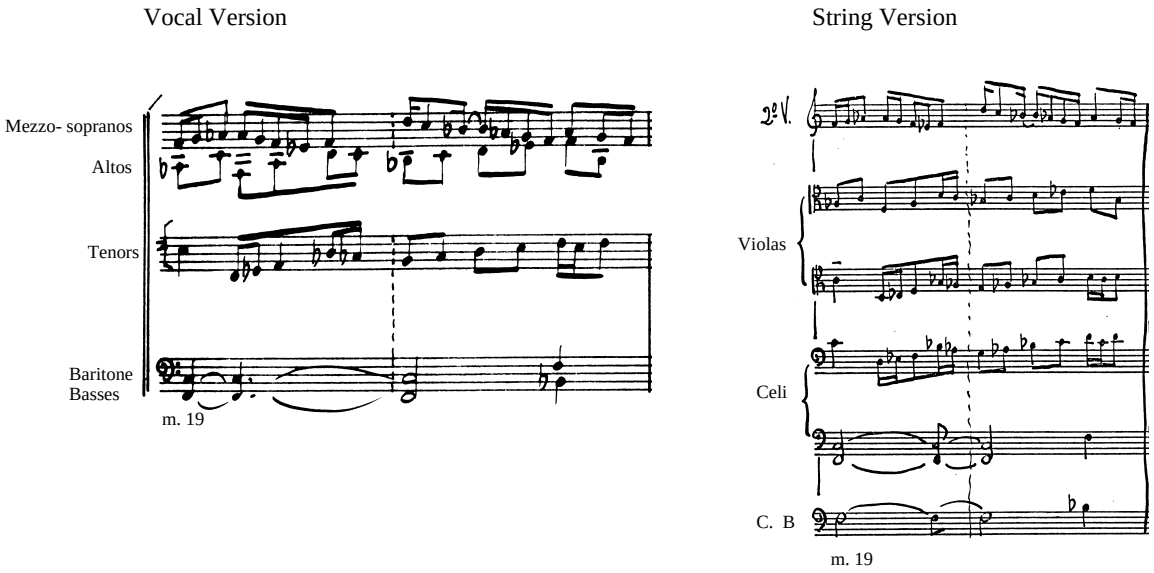
The cellos are utilized in place of baritones as in m. 1 (Example 10); but can also appear as substitutes for the tenors as in the third bar after rehearsal [5] (Example 11).



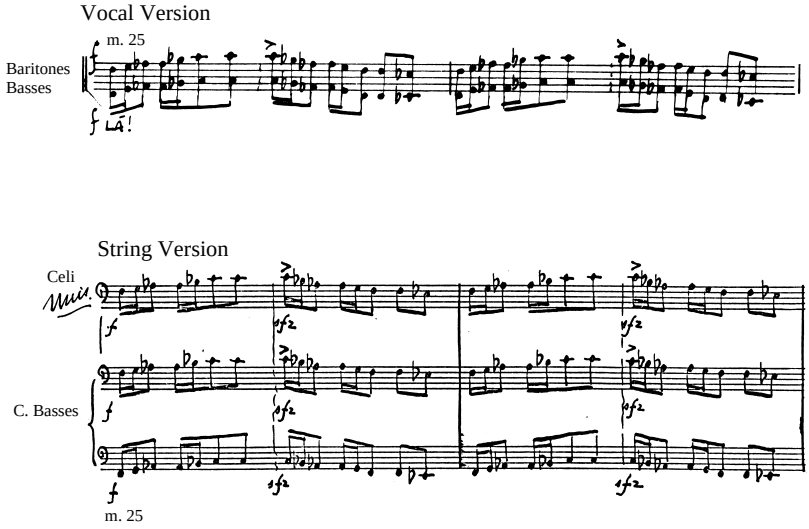
Example 10. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue mm. 1-2

Example 11 shows another instance of Villa-Lobos's choice of replacing the tenor part in **vv** with the divisi violas doubling the cellos.

The double basses are used only as the equivalent of the bass voice, but at times bass parts are written in octave divisi. This procedure, shown in Example 12, extends the low register in the same way the octave doubling in the first violins expands the high register.

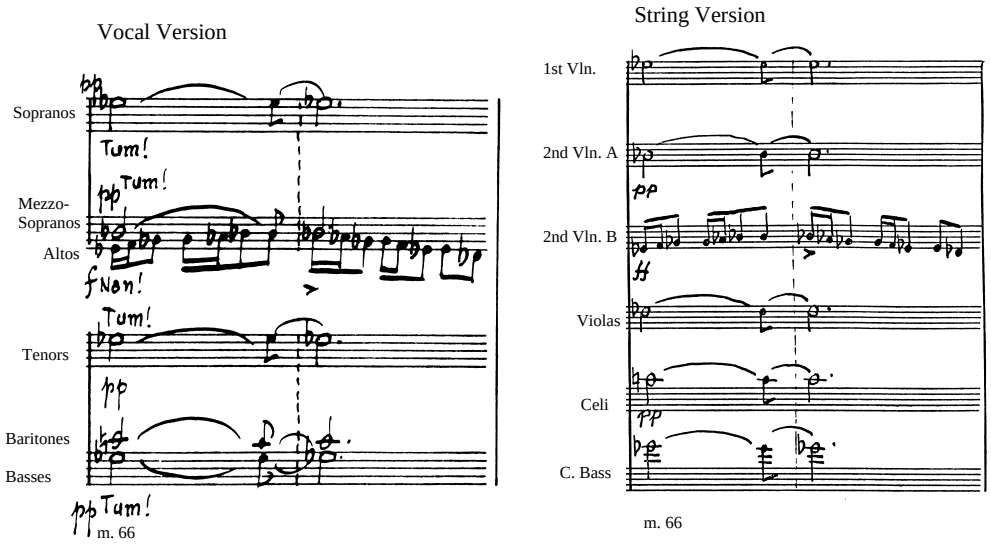


Example 11. *Bachianas Brasileiras No. 9*: vocal and string versions, third bar after rehearsal [5]



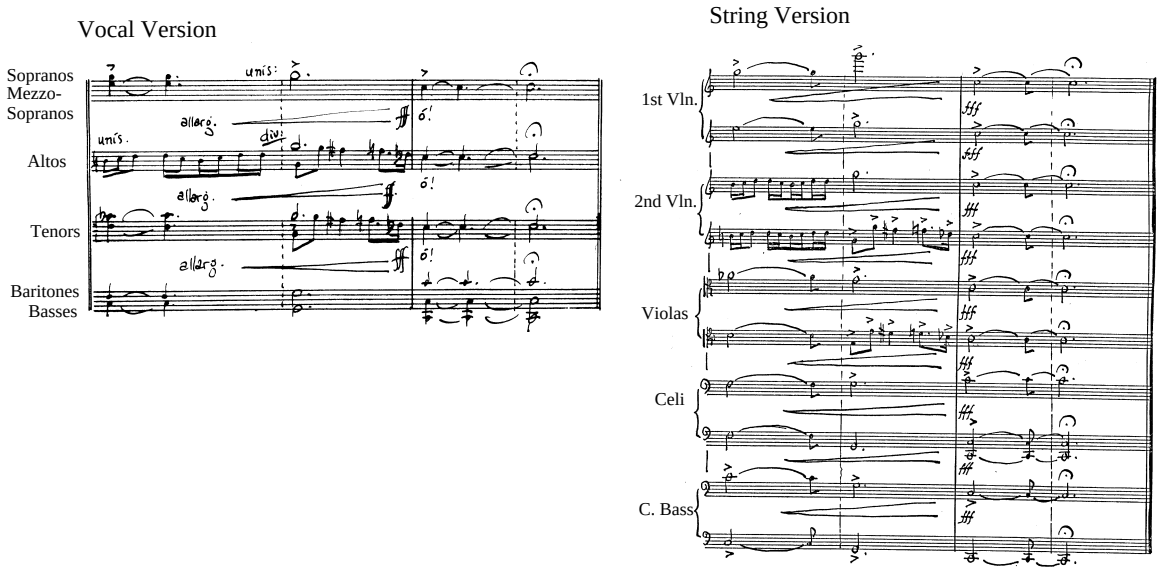
Example 12. *Bachianas Brasileiras No. 9*: string and vocal versions, Fugue mm. 25-26

A comparison of the two versions yields relevant clues to the balance of voices. Dynamic indications in **sv** are effectively used to clarify the relative importance of voices, but the instrumental parts are not always scored in a practical manner. Example 13 shows one such occurrence, five measures after rehearsal [13]. The second violin lower part is marked *fortissimo* while the upper second violins and first violins hold a sustained note marked *pianissimo*. A more idiomatic solution would be to use the entire second violin section for the thematic material while assigning the sustained notes to divisi first violins. Looking at the equivalent passage in the vocal version, it becomes clear that the lower second violin part stands in for the contralto section, the upper second violin part replaces the mezzo-soprano and the first violins substitute the soprano. This need for re-orchestration is a clear example of what Round refers to as Villa-Lobos's "miscalculations of orchestral balance". I believe that if Villa-Lobos had first thought of this work as a string piece, the divisi would be somewhat different.



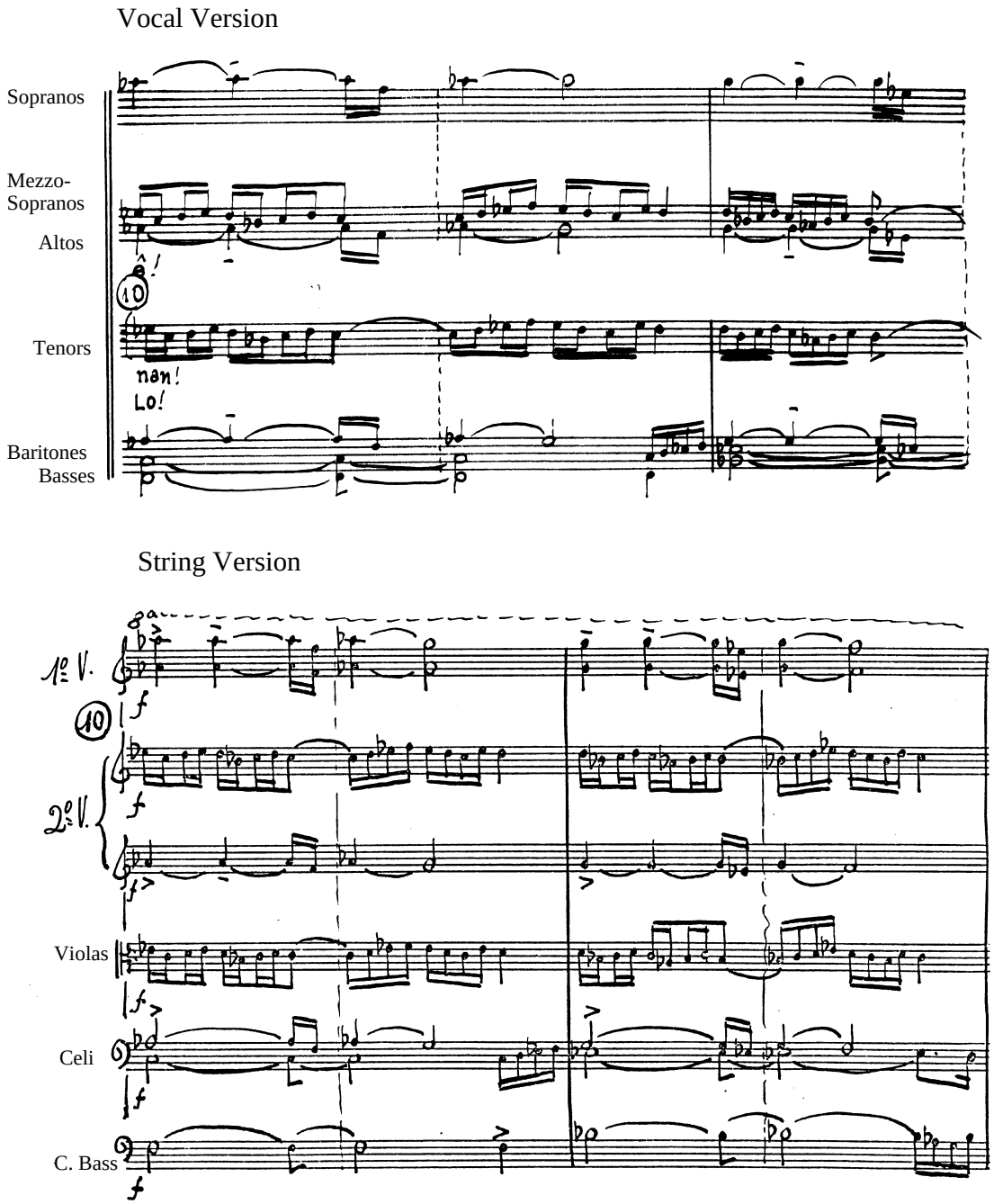
Example 13. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue m. 66

Another example of a similar miscalculation occurs at the penultimate bar of the piece (Example 14). In **vv**, the lower tenors and the lower altos sing the descending line that leads to the final cadence. In **sv**, the second violins and viola lower divisi play the passage. This orchestration is clearly unbalanced because if the divisi is followed, the majority of players will be assigned to the sustained notes.[73] A better solution for projecting the moving line is to use the entire second violin section and part of the cellos to reinforce the lower violas. This procedure is justified as a parallel to the third bar after rehearsal [5], a place where Villa-Lobos substituted the tenors in a comparable way (Example 11).



Example 14. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue final measures

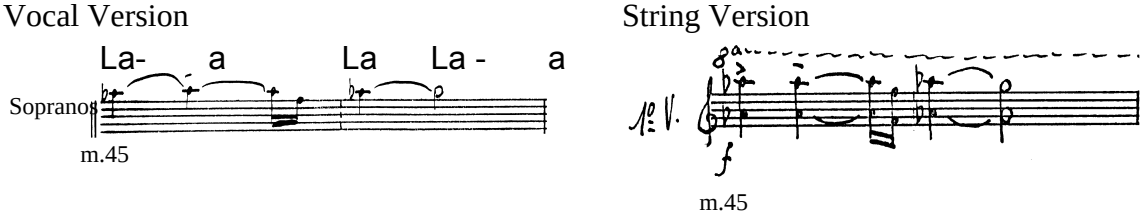
[73]Another point to consider is that inside players in the second violins and viola sections may be less accomplished players in student or amateur orchestras.



Example 15. *Bachianas Brasileiras No. 9*: vocal and string versions Fugue rehearsal [10]

As mentioned before, register expansion is an important factor in conferring distinctive features to each version. A new theme is presented at rehearsal [10], shown in Example 15.[74] It spans a four-octave range in **sv** as opposed to only three in **vv**. The use of syllables as means of articulating pitches bears a direct relation to tone production. Pitches are articulated in **vv** with syllables of varying vowel/consonant qualities. As previously mentioned, these syllables help in the creation of the appropriate atmosphere and character of the Prelude. Articulation in string performance, is primarily a matter of bowing; therefore, the choice of syllables used to articulate pitches in the Fugue may help in the choice of bow strokes.

The articulation of this theme differs significantly in both scores. The two initial quarter notes are slurred in **vv** but not in the 1st violin part in **sv**. This discrepancy can be interpreted as an indication to re-articulate the vowel *a* in the **vv** as suggested in Example 16.

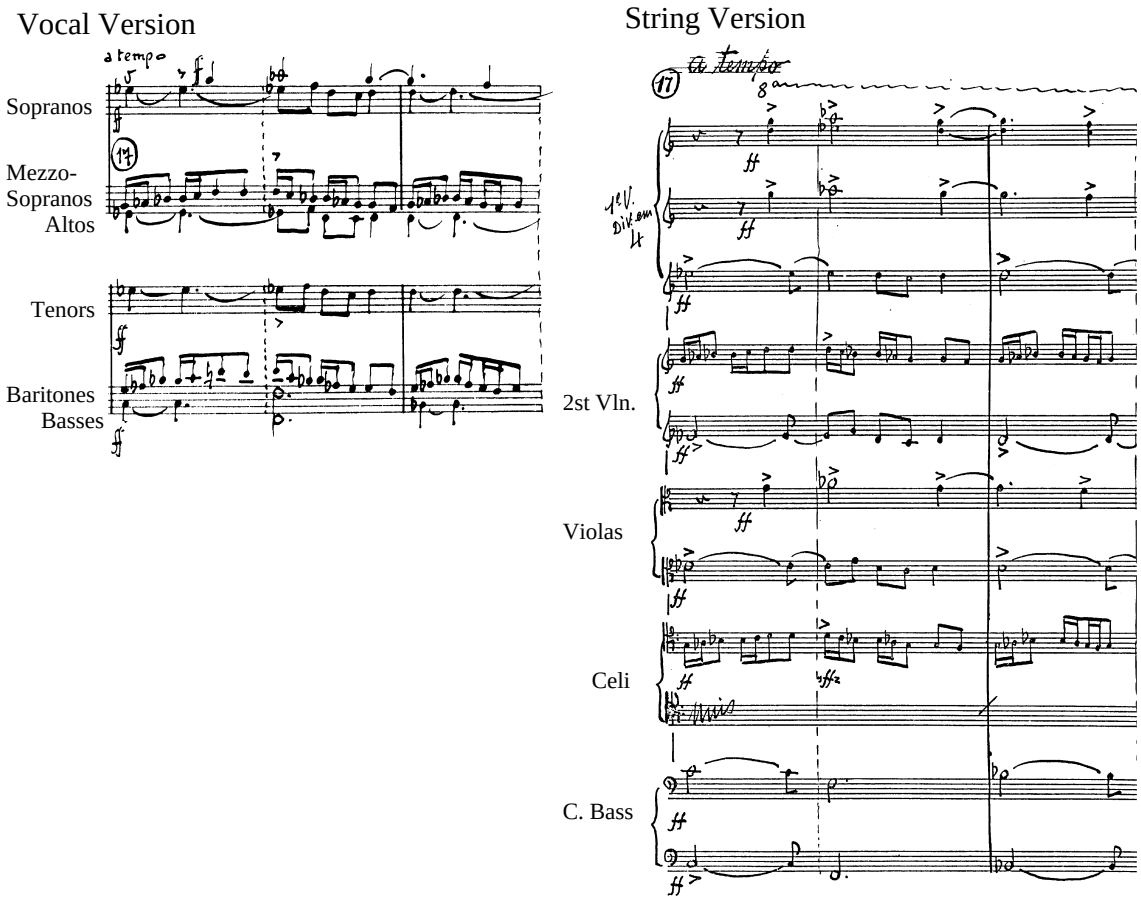


Example 16. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue m. 45

Octave doubling in **sv** also occurs at rehearsal [17] (Example 17). In this instance, Villa-Lobos fills up the octave span with the addition with organum-like

74 Villa-Lobos lists this section as one of two themes, as seen in his 1947 Bachianas Brasileiras thematic material. (Museu Villa-Lobos P.9.3.1) See appendix F.

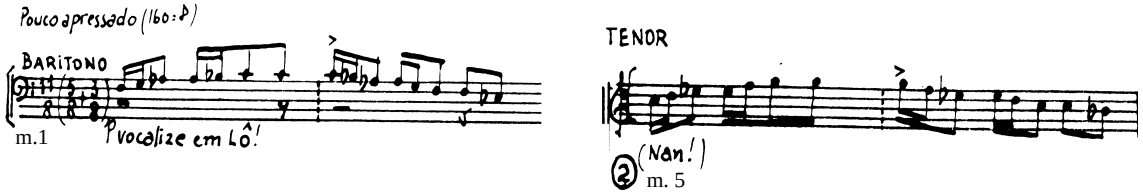
parallel fifths. This eminently vocal effect is possible due to the register expansion in **sv**. The pitches D and E♭ would clash as minor seconds in **vv** due to the polyphonic texture and voice tessitura; but in **sv**, as a major seventh, the added notes create a new sonority enhancing its vocal quality.



Example 17. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue rehearsal [17]

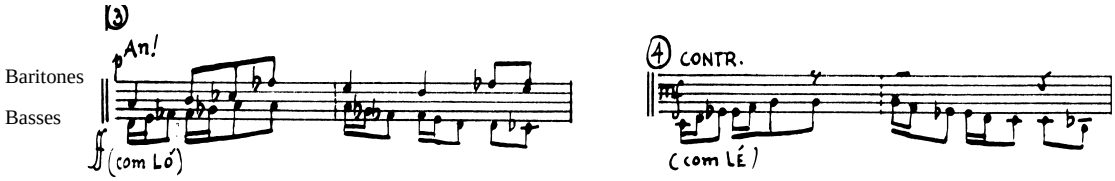
As previously discussed, the syllables in the Prelude have a prevailingly open vowel quality. The following examples show how the syllables in the Fugue, on the

contrary, emphasize the effect of the consonants upon the vowels. The baritones articulate the main theme at the exposition with the dark sounding syllable “lô” [lo] while the tenors answer with the more nasal sounding “nan” [nã] (Example 18).



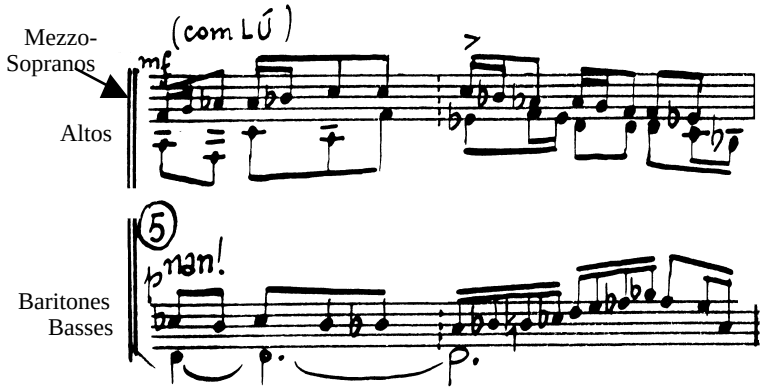
Example 18. *Bachianas Brasileiras No. 9*: vocal version, Fugue m. 1 and m. 5

The syllable “lô” [lo] changes to the open sounding “ló” [ly] when basses enter at rehearsal [3]. The alto answer, at rehearsal [4], is articulated with “lé” [lɛ] (Example 19).



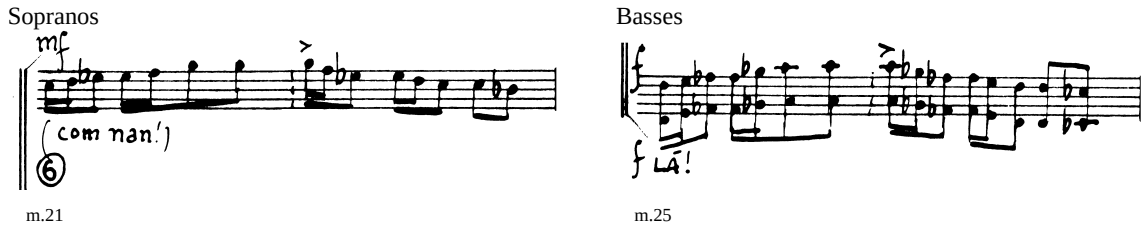
Example 19. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [3] and [4]

The mezzo-sopranos entering at rehearsal [5], carry the theme with the syllable “lú” [lu], while the accompanying voices sing the nasal “nan” [nã] (Example 20).



Example 20. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [5]

There is a discernible pattern at work in the fugal exposition. The theme entrances are articulated with vowel variations attached to the consonant "l", while the subsidiary voices sing the neutral "nam" [nã]. This pattern is broken at rehearsal [6] as the sopranos enter with the syllable "nan" [nã] and the basses answer, four bars later, with "lá" [la] (Example 21).

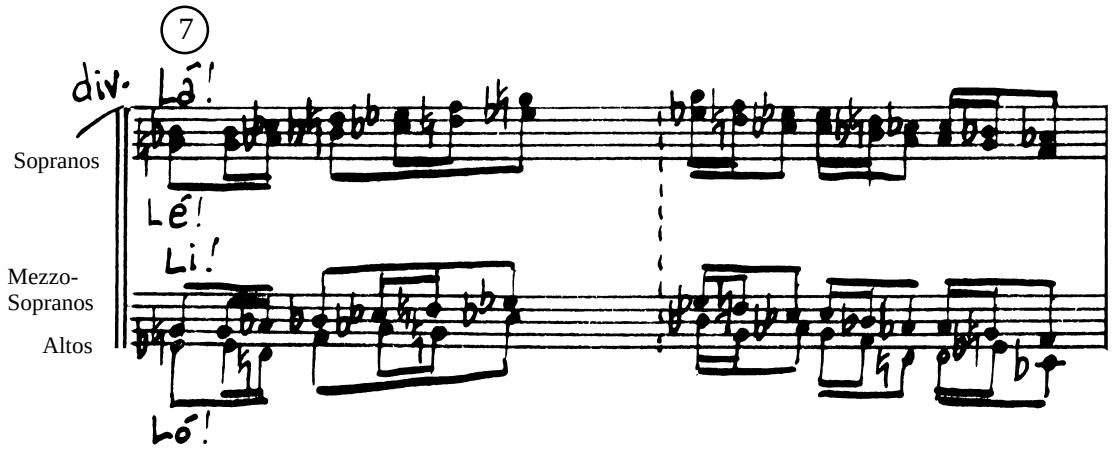


Example 21. *Bachianas Brasileiras No. 9*: vocal version, Fugue m. 21 and m. 25

The break in the pattern points to a larger design which parallels a similar procedure in the Prelude. There, the predominant *boca fechada* sonority gradually

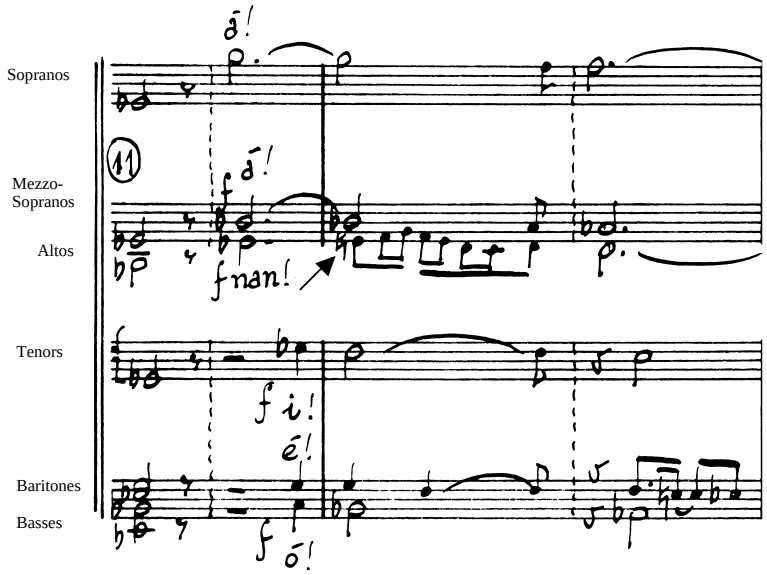
evolves into an open-sounding atmosphere. Here, closed vowels at the beginning of the Fugue slowly change to more open sounds leading to the restatement of the theme on the syllable “lá” [la]. (Example 21)

The fugue progresses as closed vowels gradually yield to open ones used simultaneously as seen below. Example 22 shows how the episode, starting at rehearsal [7], uses the syllables “lá”[la], “lé”[lɛ], “li”[li] and “ló”[lɣ] simultaneously, to underline the coloristic quality of the harmony.

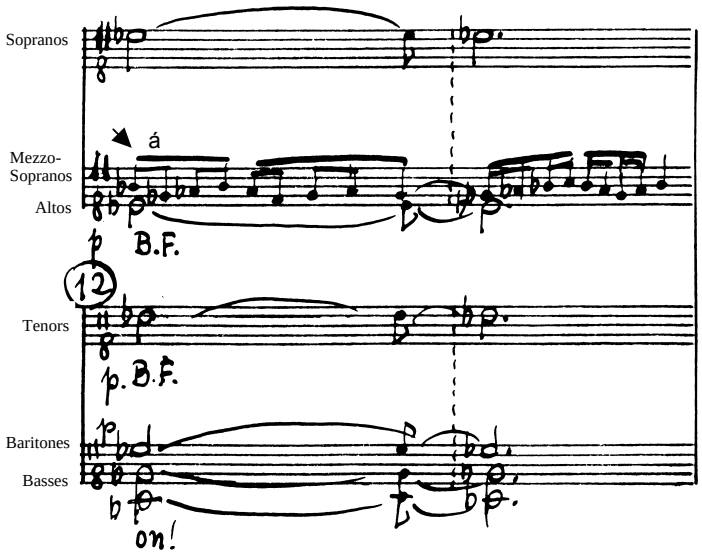


Example 22. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [7]

Villa-Lobos uses the multiple possibilities of syllable combination to produce a variety of sonorities. For instance, at rehearsal [11] the altos sing thematic material with the syllable “nan” [nã] while the accompanying voices use open vowels sounds. (Example 23)



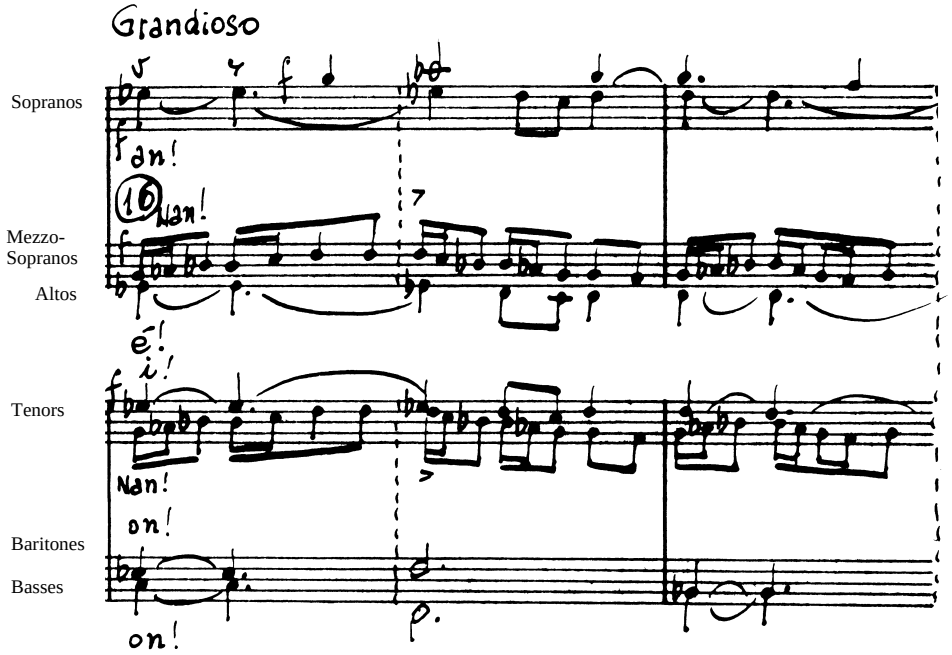
Example 23. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [11]



Example 24. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [12]

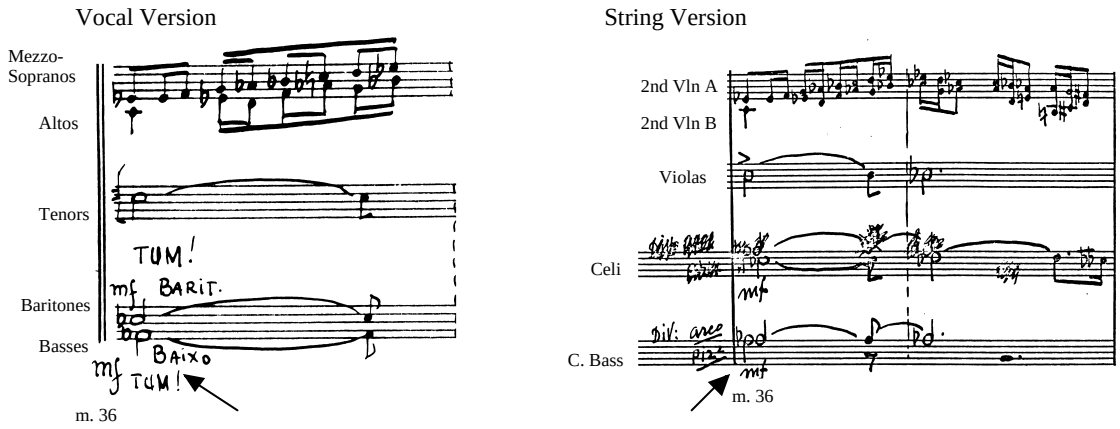
At rehearsal [12], the vowel á [a] articulates the thematic material while the subsidiary lines sing *boca fechada*. The combination of sonorities results in a mellower sound. (Example 24)

The syllable “nan” [nã] gradually replaces the *boca fechada*, building up a more powerful sonority as the piece approaches its climax. The poignant melody introduced at rehearsal [16] and [17] is articulated with “an” [ã]—a nasal sound very much in character with the plaintive quality of this melody. The main theme, stated at the same time, maintains the nasal quality of the sound but uses “nan” [nã] in order to articulate the rhythm (Example 25).



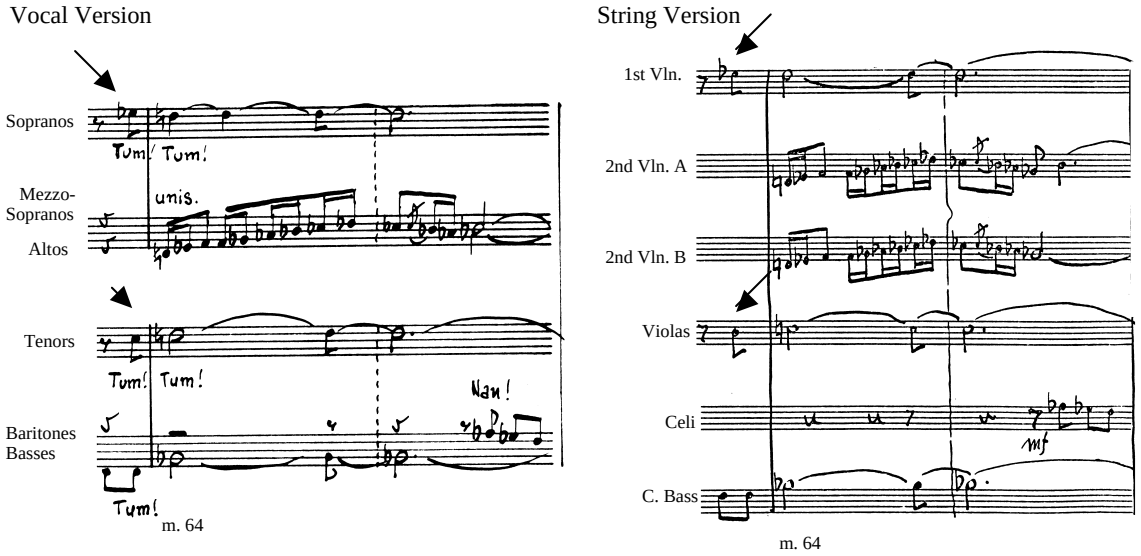
Example 25. *Bachianas Brasileiras No. 9*: vocal version, Fugue rehearsal [16]

Another innovative use of coloristic possibilities of syllables is shown one bar before rehearsal [8](Example 26). The resonant syllable “tum” [tum], is used for the first time with the full power of the baritones and basses, while at the equivalent measure in **sv** the basses are divided to include a pizzicato effect.



Example 26. *Bachianas Brasileiras No. 9*: vocal and string versions m. 36

Following a section in which long notes, sung with open vowels, served as an accompaniment to the main theme in the basses, the syllable “tum” [tum] is used again three measures after rehearsal [13], Example 27. This time in *pianissimo*, its function is to articulate the sustained notes as the sound color darkens and the full ensemble is engaged in a livelier passage preparing the mid-point cadence, two measures after rehearsal [14]. Villa-Lobos did not indicate a pizzicato in **sv** as a parallel to m. 36 (Example 26). Nevertheless, the comparison of the two scores suggests that these notes without articulation marks, could be slightly accented to match the sound of the syllable “tum” [tum] (Example 27).



Example 27. *Bachianas Brasileiras No. 9*: vocal and string versions, Fugue rehearsal [13]

Villa-Lobos's explored the rich possibilities of the human voice throughout his composing career. The celebrated Aria from *Bachianas Brasileiras No. 5*, which has become indelibly identified with his name, is but one instance of his innovative vocal writing. As one studies how the syllables articulate pitches in *Bachianas Brasileiras No. 9*, his unusual designation of the chorus as an 'orchestra of voices' becomes justified. The combination of vowels and consonants afford the chorus a variety of sounds comparable to the variety of bow strokes available to the strings. Villa-Lobos's masterful use of these possibilities ensures the clarity of articulation of the thematic material in the fugue, and creates the mysterious atmosphere of the Prelude. The abstract syllables in place of a poetic text is in keeping with the equally abstract content of the music.

The above comparison of the two version seems to corroborate that the string version is a transcription of the vocal version. The very distinctive characteristics of the

two versions preclude any attempt to match all the nuances of a chorus in a string performance. Nevertheless, insights gained from the study of the vocal score may support decisions for a string orchestra performance. Villa-Lobos set out to explore the full potential of each medium. These two very distinct pieces, in spite of their shared text, attest to his success.

CHAPTER IV

VILLA-LOBOS'S *BACHIANAS BRASILEIRAS NO. 9*: A STRUCTURAL ANALYSIS AS FOUNDATION FOR RECORDING COMPARISON

There are numerous features that can be compared among recordings of a single work. One must decide the scope and goals of such a comparison at the outset, in order to achieve meaningful and practical results. The possible methods and objectives of recording comparison were dealt with in chapter two. The application of those comparative procedures to Villa-Lobos's *Bachianas Brasileiras No. 9* for string orchestra aims at clarifying performance issues. Nevertheless, the choice of which features to compare must be grounded in a clear understanding of the structure of the work.

The accompanying graphs summarize the following analysis. It projects the structure of this complex piece into a horizontal line for the purpose of visualizing its unfolding.

Analysis of the Prelude

The prelude is thirty-seven measures long. A C major cadence, in measure 19, divides the piece into two contrasting halves. The first half, written as an introduction, leads to a full textured chorale. In the thematic catalog, *Bachianas Brasileiras: Material Temático*, Villa-Lobos lists the second half of the composition as the theme for the Prelude.[75]

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[75] Museu Villa-Lobos item P.9.3.1, manuscript listing of thematic material for the Bachianas Brasileiras, (1947) .

Prelude

Tempo marking *Vagaroso e Místico* ♩ = 60

Formal structure Introduction — Choral — High melodic point — Parallel to beginning — Transition to Figue

Phrase structure Asymmetrical ↔ Symmetric ↔

Four bar phrase — Four bar phrase — Four bar phrase — Extended phrase

Instrumentation Violas — Viola Solo — Violins divisi a 4

Texture Homophony ↔ Polyphony ↔ Homophony ↔

Measure numbers 1 — 3 — 9 — 14 15 — 18 — 19 — 21 — 24 25 — 28-29 — 30 — 34 35 — 36-37

II: In Villa-Lobos Recording :II

Note duration Sustained notes — Moving notes over sustained notes — 𝅗𝅥 — ♩ & ♪ — Hyper-measure (4/2) momentum increase — Syncopations

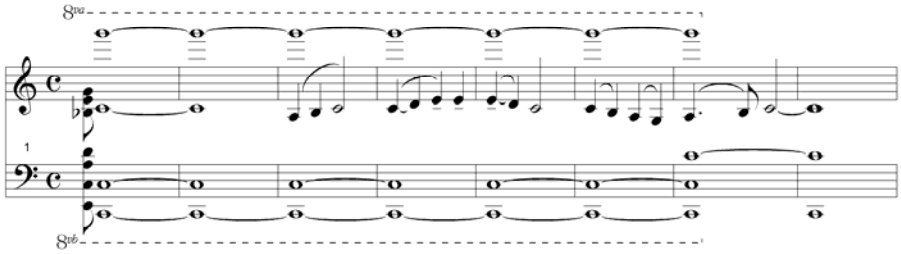
Harmony **Pedal C-G, undefined key** — Chromatic descending line Progression leading to — C Major cadence — Augmented 6th dominant preparation — C/V7 — V+7 — Dissonant F# — V6 V567 — V/IV

Table 1. *Bachianas Brasileiras nº 9*: Prelude

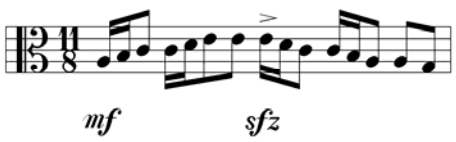
Villa-Lobos's tempo indication for the piece is *Vagaroso e Mistico* h = *60*. *Vagaroso* in Portuguese means slowly. However, *vagar*, the root of the word, has the additional connotation of "walking somewhat aimlessly". *Mistico* means mystically. Villa-Lobos achieves this mystical and somewhat aimless character through harmonic ambiguities and asymmetrical phrase structure.

Harmonic ambiguities in the first half of the Prelude.

The explosive opening chord (C-A-D-Bb-E-G) gives way to a sustained CC-g^4 sonority that functions as a frame to the unfolding of a slow melody in mm. 3-8, shown in Example 28. The violas present this melody, later transformed into the theme for the fugue, as shown in Example 29.

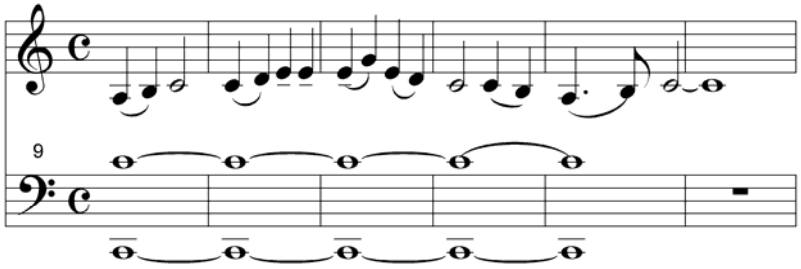


Example 28. *Bachianas Brasileiras No. 9*: Prelude, score reduction, mm. 1-8



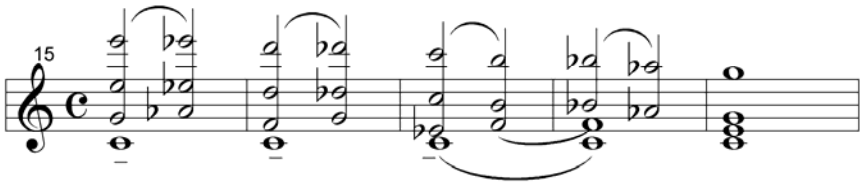
Example 29. *Bachianas Brasileiras No. 9*: theme of Fugue transposed to A minor

The extreme registral distance between the sustained CC and g^4, coupled with the clear A minor outline of the viola melody, impede us to hear the pitch E, in the fourth measure, as the third of a C major chord (Example 28). Furthermore, in spite of the fact that C major is clearly outlined in m. 11 as the solo viola reiterates the melody, (Example 30) the unharmonized ending on c^1, prolongs the vague mood of the passage.



Example 30. *Bachianas Brasileiras No. 9*: Prelude, score reduction, mm. 9-14

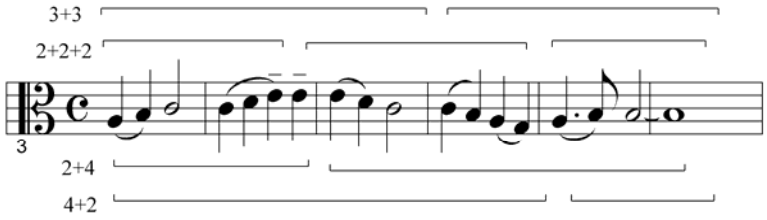
The first complete C major harmony occurs in m. 15, at the beginning of a clear four-bar phrase, shown in Example 31. This descending passage over a pedal on c^1, leads purposefully to the C major cadence that marks the middle point of the movement.



Example 31. *Bachianas Brasileiras No. 9*: Prelude, violins in four-part divisi mm. 15-19

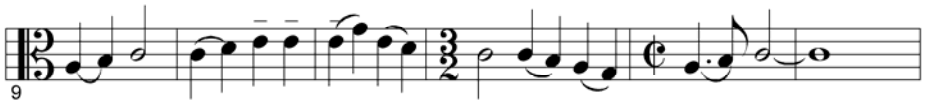
Phrase structure in the first half of the Prelude

The phrase structure also contributes in a significant way to the mysterious atmosphere prevalent in the first half of the prelude. As mentioned above, the violas present a six-measure long melody in mm. 3-8 (Example 32). This melody revolves around the pitch C, and for this reason, has a static quality. Moreover, attempts to sectionalize this phrase, as indicated in the same example, in groupings of 2 + 2 + 2, 2 + 4, 4 + 2 or 3 + 3 measures do not seem musically satisfying.



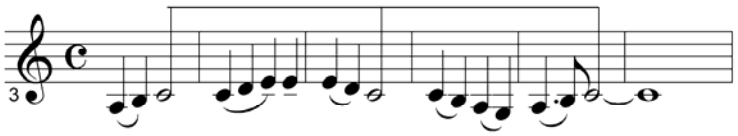
Example 32. *Bachianas Brasileiras No. 9*: Prelude, possible groupings of mm. 3-8

The $\frac{3}{2}$ measure (m. 12) inserted at the solo viola repetition of the theme, adds yet another asymmetrical turn, thus contributing to the unpredictability of the phrase length (Example 33).

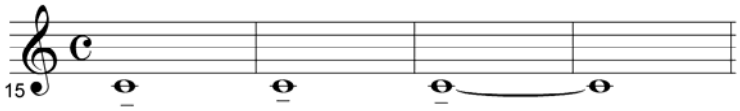


Example 33. *Bachianas Brasileiras No. 9*: Prelude, viola solo mm. 9-14

In contrast to the undefined rhythmic flow of the previous section, the passage in mm. 15-19 presents the first symmetrical phrase structure (Example 31). The brackets in Example 34 show the ingenious way in which the outline of the initial viola melody becomes the lowest violin voice in mm. 15-18 (Example 35).

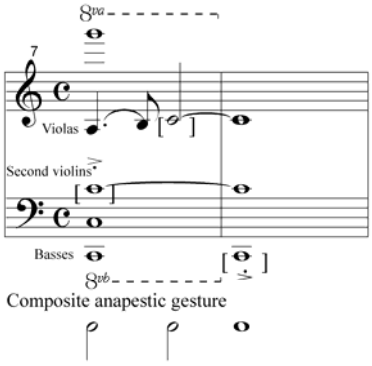


Example 34. *Bachianas Brasileiras No. 9*: Prelude, thematic elaboration mm. 3-8



Example 35. *Bachianas Brasileiras No. 9*: Prelude, second violin B mm. 15-18

The articulation dashes under these repeated Cs indicate that these pitches are not just harmonic common tones, but an intentional anapestic gesture. It is an augmentation of the gesture formed as violins, violas and basses re-articulate the pitch C, in mm. 7- 8. These re-iterations of the pitch C, which mark the sudden end of the sustained g^4 and CC, can also be heard as an anapestic gesture, shown with brackets in Example 36

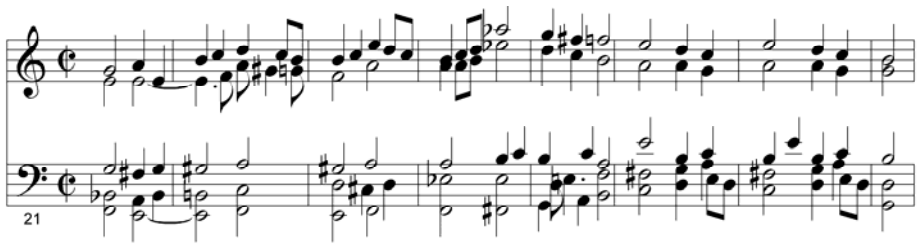


Example 36. *Bachianas Brasileiras No. 9*: Prelude, mm. 7-8

This anapestic gesture calls attention to register shifts. Its first occurrence marks the narrowing down of the eight-octave register span of the opening chord, to two octaves in mm. 7-8, as the g^4 drops out and CC moves up an octave to C. The registral span is further reduced to one and a half octaves as the augmented version of this gesture, supports the harmonic progression leading to the cadence in m. 19.

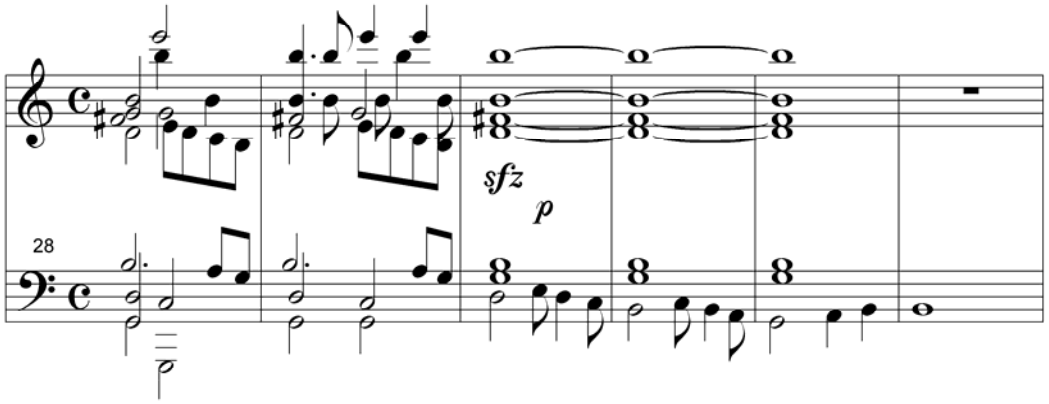
Chorale section

In sharp contrast to the first half of the Prelude, the chorale section (mm. 21-30) unfolds in four bar phrases, full texture, and forceful harmonic motion (Example 37).



Example 37. *Bachianas Brasileiras No. 9*: Prelude, score reduction mm. 21-28

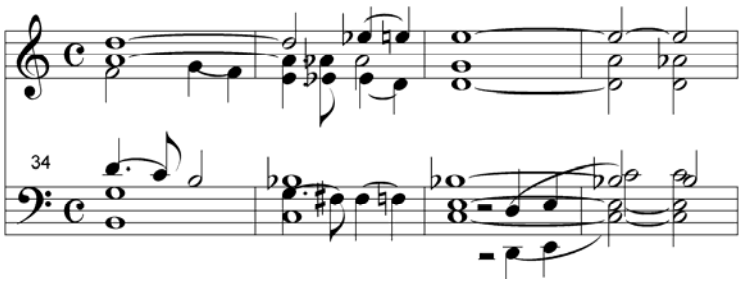
Increasing rhythmic activity (mm. 28-29) brings the chorale to a close with a cadence in m. 30 (Example 38). This cadence, on a GM^7 chord, is evocative of the opening measure. In a clear parallel to the viola melody in mm. 3-8, the *sforzzato* attack precedes the sustained sonority that frames the four-measure phrase played by the double-basses in mm. 30-33.



Example 38. *Bachianas Brasileiras No. 9*: Prelude, score reduction mm. 28-33

The syncopated motive in the bass, mm. 30-31, anticipates the rhythmic character of the fugue (Example 38). This return to a monodic texture prepares the way for the fugal exposition.

Closing the Prelude, Villa-Lobos recreates the mysterious atmosphere of the beginning measures with an unresolved suspension. This final chord is almost identical to the opening chord in **sv**. The pitch G moves to A in m. 36 and then down to A♭ preparing F minor (Example 39).



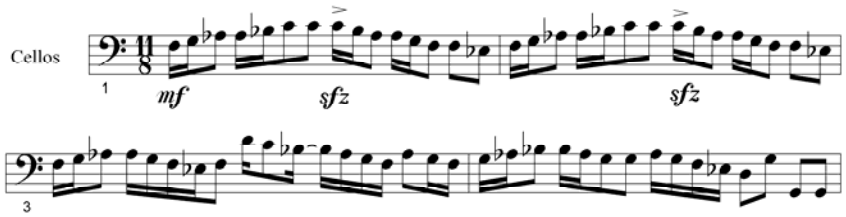
Example 39. *Bachianas Brasileiras No. 9*: Prelude, score reduction, mm. 34-37

Analysis of the Fugue

The fugue is 99 measures long. A second theme, stated in mm. 45-50, divides the work into two halves. The exposition and the first episode occupy the first half. The more intricate second half consist of several short episodes, false entries, new thematic development and a *stretto* like section with the simultaneous exposition of three themes. A final unison on the pitch C brings the Fugue to its dramatic conclusion.

Theme

The twenty-eight-measure exposition comprises six entries. The cellos present the first statement of the theme in F minor (Example 40).



Example 40. *Bachianas Brasileiras No. 9*: Fugue, first entry mm. 1-4

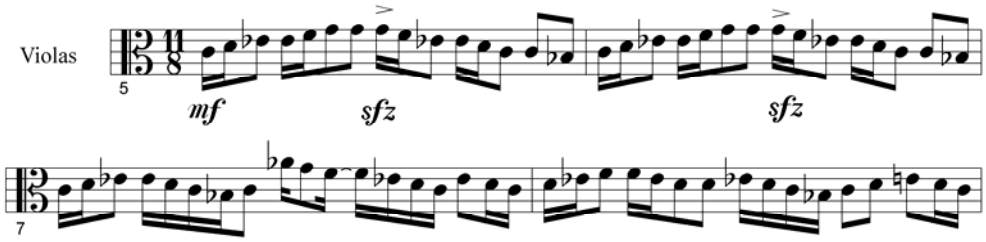
Fugue

Tempo markings	*Poco apressado* ♩ = 90															*Molto Rallentando*		*a Tempo*	*Poco ritenuto*			*Rallentando*	*Grandioso*		*a Tempo*		*Allargando - Meno*	*Allargando*	*a Tempo*		
Structural segment	**Exposition**							**Episode I**				**New Theme**		* (Episode II) **Short Episode**		**Short Episode**		**Short Episode**				**Short Episode**		Simultaneous Statements of Themes			**Short Episode**				
	Entry	Answer					Redundant entry								Middle entry		False entry														
Orchestral section presenting thematic material	Cellos	Violas	Basses	Violins II B	Violins II A	Violins I	Cellos & Basses	Violas, Cellos & Basses	Violins I & II chordal texture	Violins I & II alternating fragments	Violins I & II Antiphonal	Violins I, IIB & Cellos	Tutti	Violins II & Violas	Basses	Violins II, Cellos & Violas	Violins IIB	Violas & Basses	Violins I & II	Violins IIA		Violas	Basses	Violins IIA & Violas B		Violins IIA & Cellos	Violins IIB & Cellos	Violas, Violins I & II			
Theme entering pitch	F	C	F	C	F	C	F								Eb		Eb		G		D	A	G	C	G	C				
Orchestral section presenting secondary material		Counter-subject Cellos	Counter-subject Violas	Counter-subject Basses &	fragments Cellos	Counter-subject divided between Violins II & Violas	Violins I					Violins IIA & Violas Sixteenth-note figure derived from new theme			Tutti, short chords support harmonic progression										Violins IA & Cellos A: variation of theme B in augmentation. Violins IB, IIB & Violas: elaboration of the variation			Texture changes gradually to a single line moving in sixteenth notes, against sustained notes, leading to the Unison C		
Counter-subject entering pitch		Eb	Ab			Eb	Ab																								
Measure numbers	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-38	39-44	45-50	51-55	56-58	60-63	64-65	66-67	68	69	70	71	72-74	75-77	78-81	82-84	85-87	II: 88-90	:II 91-92	93-95	97-98	99
Harmonic events												Incisive Motion towards Eb Major cadence	Undefined harmonic direction	Eb minor			Eb minor	Progression from Eb minor to	A minor	A minor	B minor cadence	D minor with flat 5th	A minor	Progression to	C minor			Eb minor to	G Major	Unison C

* The short episodes (mm. 56-69) are grouped under the heading Episode II for the purpose of recording comparison. Note similarities in number of measures with Episode I

Table 2. *Bachianas Brasileiras nº 9*: Fugue

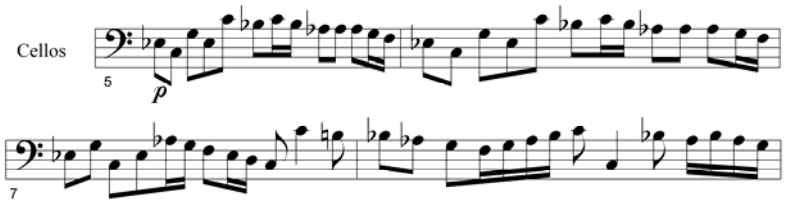
The violas state the answer in C minor, in measures 5-8 (Example 41). Basses and second violins B, entering respectively in m. 9 and m. 13, take turns stating the theme following the same f minor-c minor pattern. The last entering voices, second violins A and first violins, repeat the same harmonic design. The redundant entry, stated with the full power of basses and violoncellos in mm. 25-28, reaffirms F minor at the closing of this section.



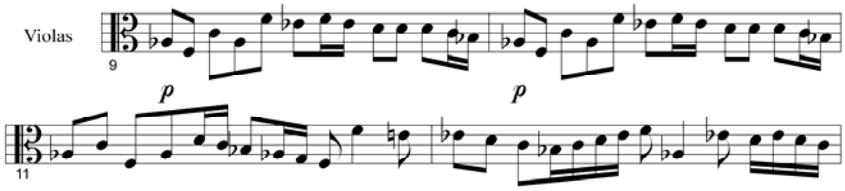
Example 41. *Bachianas Brasileiras No. 9*: Fugue, second entry mm. 5-8

Counter-subject

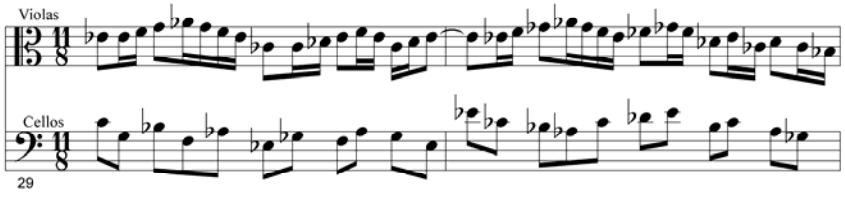
Villa-Lobos uses a counter-subject in varied ways. Violoncellos and violas present the counter-subject in mm. 5-8 and mm. 9-12 respectively (Example 42 and 43). A fragmented version of the counter-subject is coupled with theme entries in mm. 13-20. A full version of the counter-subject returns to accompany the two closing entries, in mm. 21-28. Starting in m. 21 the counter-subject is divided between second violins and violas for its last statement.



Example 42. *Bachianas Brasileiras No. 9*: Fugue, counter-subject mm. 5-8



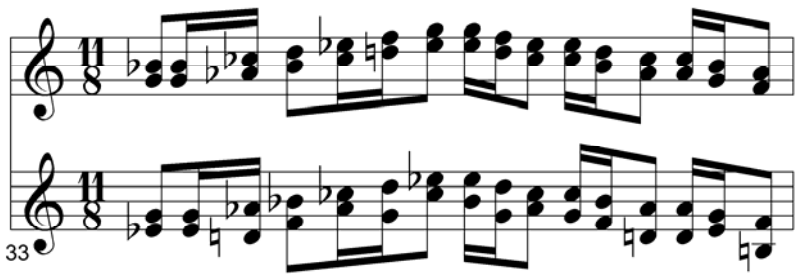
Example 43. *Bachianas Brasileiras No. 9*: Fugue, counter-subject mm. 9-12



Example 44. *Bachianas Brasileiras No. 9*: Fugue, mm. 29-30

The first episode, comprising sixteen measures, is the longest and is divided in three parts. In the first one, the violas present a melody derived from the main theme while cellos and basses accompany with material related to the counter subject (Example 44).

Violas, cellos and basses alternate sixteenth-note figurations in the following two measures while the harmony moves to Eb. In the second section of this episode, mm. 33-36, the first and second violins state a variation of the main theme in chordal texture. This variation, written in four parts, actually has only three, because the first violins B and second violins A have identical parts (Example 45). In the close of the second segment, the full texture gives way to alternating fragments tossed back and forth between first and second violins, mm. 37-38.

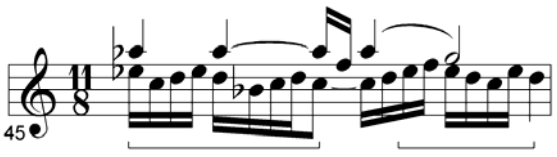


Example 45. *Bachianas Brasileiras No. 9*: Fugue, violins in chordal texture m. 33

In the third part of the first episode the first and second violins have antiphonal sixteenth-note figurations. The increased rhythmic activity of these figurations, lead to the statement of the second theme.

Second theme

The new theme, based on a single gesture, starts in m. 45. This short phrase is repeated six times is accompanied by a sixteenth-note figure built from its own melodic elaboration, shown in brackets in Example 46.



Example 46. *Bachianas Brasileiras No. 9*: Fugue, second theme m. 45

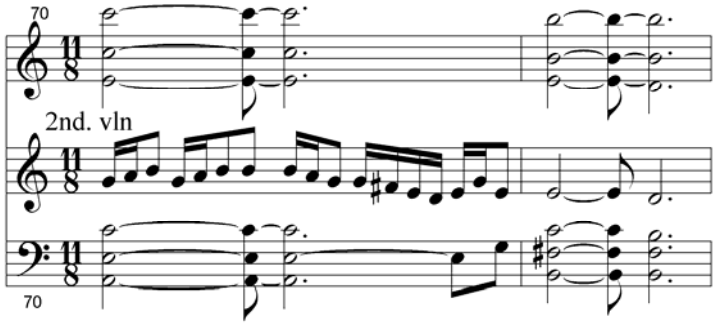
The resolute harmonic progression of this passage leads to an Eb major cadence, in m. 50, marking the middle of the piece. A passage of transitional character shifts the mode to Eb minor in m. 55. The following short episode is built from elaborations of the sixteenth-note figuration used as the accompaniment to the second theme.

Basses state the main theme in Eb minor at the middle entry, starting in m. 59, while violins and violas interject short punctuation chords that define the harmonic progression. Short episodes precede and follow a false entry, in Eb minor, in mm. 66-67.

A transitional episode leads, with a *molto ritardando*, to a false entry in m. 70. This entry, in G major, is stated against a sustained A minor chord and leads to a cadence in B minor (Example 47).

This double suspension on B minor reminds the listener of the cadential suspension at the end of the Prelude creating the same expectant atmosphere (Example 48). The parallel to m. 1 is further reinforced as the violas continue, after the fermata, with a condensed version of the main theme. This viola entry, in D minor with the

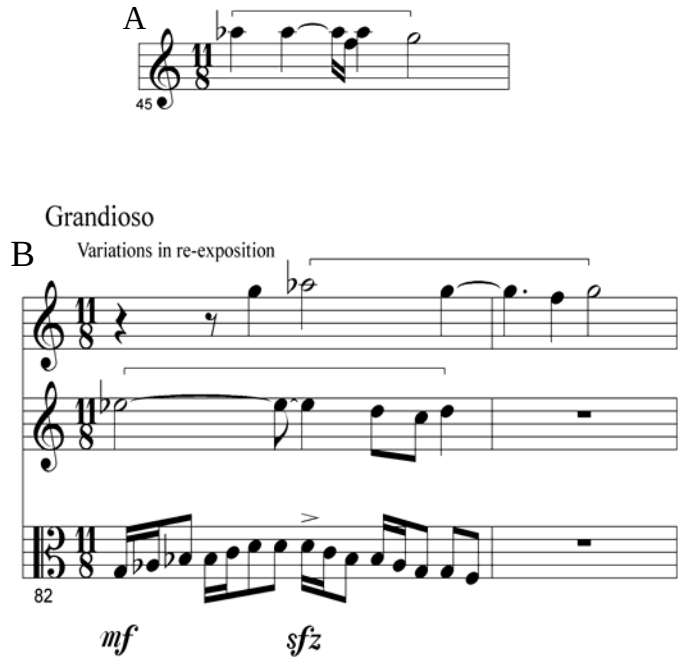
lowered fifth degree (Ab) initiates the re-exposition. The basses, however, continue with an entry in A minor, and the following episode moves to C minor in m. 82, conferring a transitional nature to the section.



Example 47. *Bachianas Brasileiras No. 9*: Fugue, false entry in G major mm. 70-71

Example 48. *Bachianas Brasileiras No. 9*: Fugue m. 71 and Prelude m. 37, comparison of cadences

The following section, designated *Grandioso,* presents the main theme simultaneously with two melodies derived from the second theme, over a circle of fifths in the bass. The brackets in Example 49 indicate how the three themes are derived from the same descending half-step interval.



Example 49. *Bachianas Brasileiras No. 9*: Fugue, second theme thematic elaboration

Villa-Lobos's recording includes a repeat of measures 87-92 not found in the score.[76] As a result of this repeat, condensed entries occur six times between mm. 82-92—the same number of entries as those in the exposition. The entries alternate between C minor and G minor, following the same intervallic scheme of the exposition.

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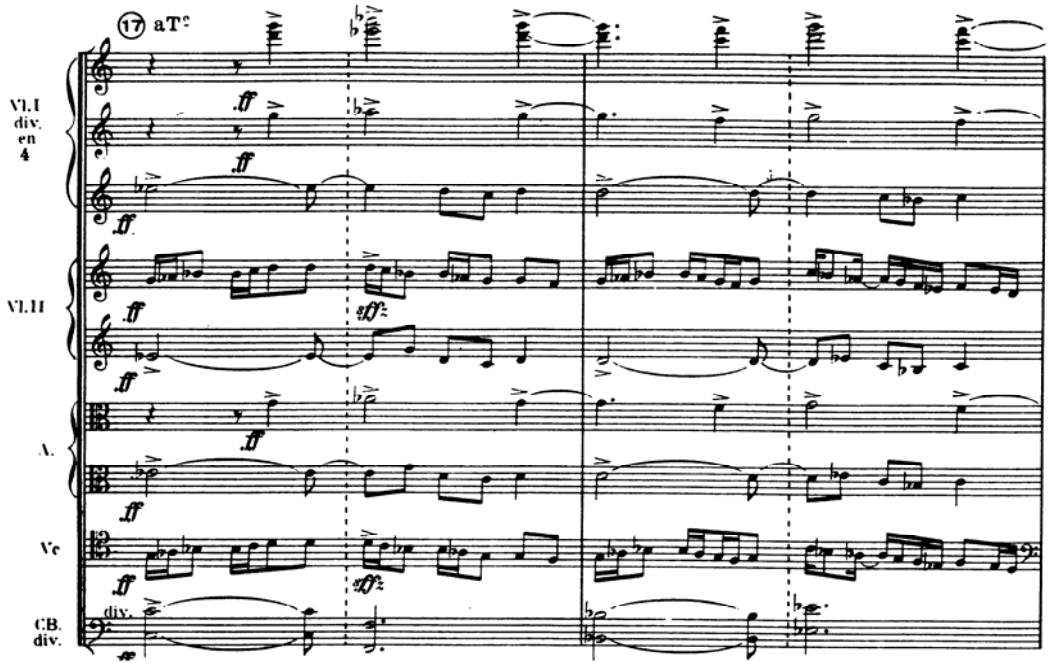
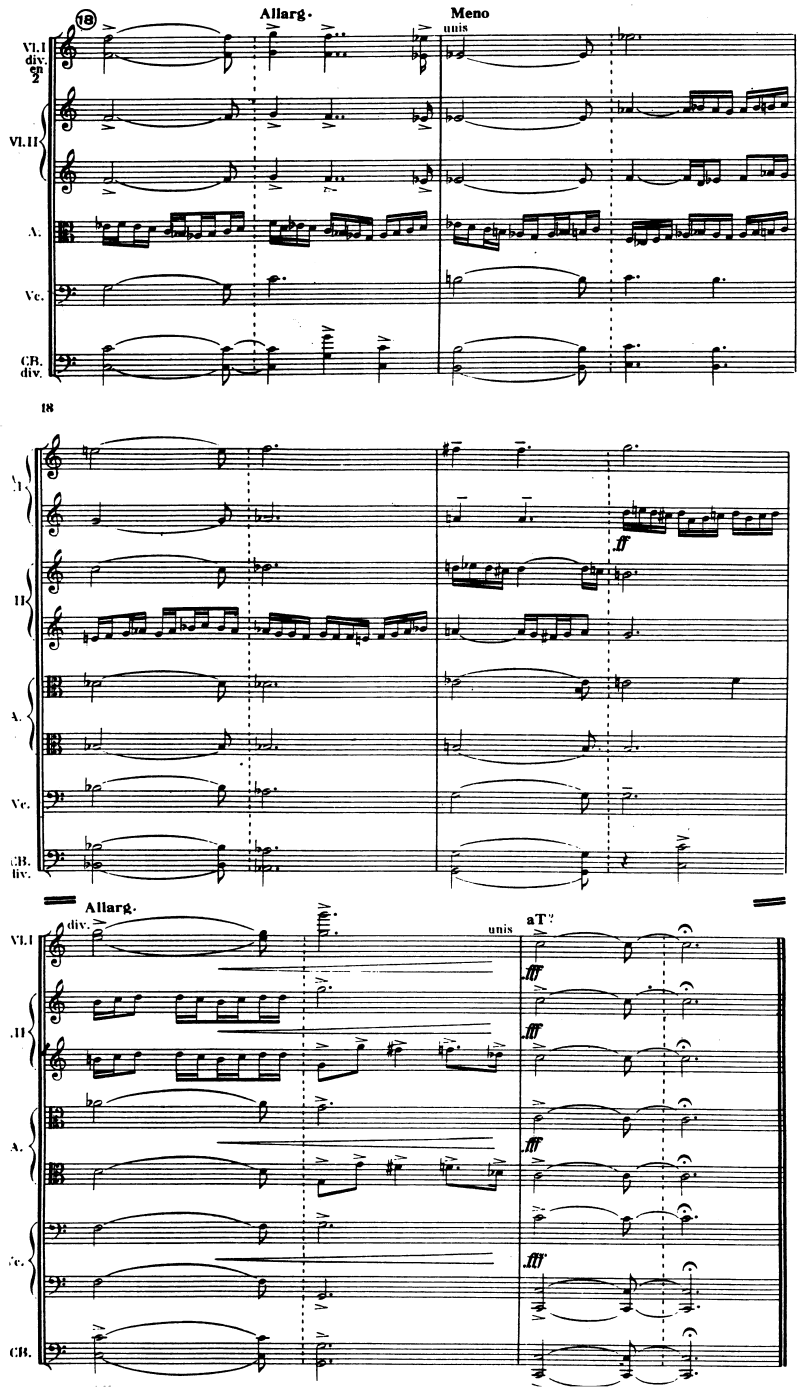
[76] Orchestre National de La Radiodiffusion Française—EMI 7243 5 66964 2 6

The aforementioned circle of fifths plays a major role in building momentum towards the culmination of the fugue; its forceful harmonic drive supports the condensed theme entries, functioning as a *stretto*. These repeated measures are undoubtedly the high point of the fugue. Marked *a tempo,* this section is an expanded repeat of the *Grandioso*. The divided violins introduce doublings at the fifth and at the octave to the subsidiary melodies, expanding the sound spectrum in this climactic passage (Example 50).



Example 50. *Bachianas Brasileiras No. 9*: Fugue, full score, rehearsal [17]

In the section marked *Meno*, m. 95, sixteenth-note figurations forcefully converge all voices into a progressively homophonic texture that leads the work to its powerful conclusion on the unison C (Example 51).



Example 51. *Bachianas Brasileiras No. 9*: Fugue, full score mm. 94-99

CHAPTER V

VILLA-LOBOS'S *BACHIANAS BRASILEIRAS NO. 9*: A COMPARISON OF RECORDINGS

The two versions of Villa-Lobos's *Bachianas Brasileiras No. 9*, as well as key structural elements were examined in chapters three and four respectively. This chapter will describe the findings of a comparison of the following performances: the composer's own recording with the *Orchestre National de La Radiodiffusion Française*;[77] the recording of Michael Tilson Thomas with the New World Symphony;[78] the recording of Odaline de la Martinez with the BBC Singers;[79] and my own recording with the *Orquestra de Câmara Theatro São Pedro*.[80]

The study of these recordings considers the following issues: Villa-Lobos's recording as a complement to the score; the vocal version compared to the string version; and tempo flexibility.

I am grateful to Prof. José Bowen for providing a copy of the software *Tempo* which was used to obtain the data for the study of tempo flexibility in these recordings.[81]

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77 *Villa-Lobos Bachianas Brasileiras Nos. 1,2,5, & 9, Orchestre National de La Radiodiffusion Française*, EMI 7243 5 66964 2 6.

78 *Alma Brasileira*, Michael Tilson Thomas and the New World Symphony, RCA 09026-68538-2.

79 *Villa- Lobos Chamber and Choral Music*, Odaline de la Martinez, Lontano, and The BBC Singers, Lorelt lNT 102.

80 *Construção*, CD recorded live with the *Orquestra de Câmara Theatro São Pedro*, December 11, 1995, Bayreuth, Germany, Limited edition.

81 Tempo Code to time keystrokes. Copyright © 1994 by James Davis -jedavis@cs.stanford.edu

This software calculates the tempo for each beat as well as the average tempo per measure. The program generates a text file, obtained from tapping on any key of the computer keyboard. This file includes tempo data both for beats and for bars which can be used in a spreadsheet application to tabulate the results.

The Prelude and the Fugue were examined according to the structural analysis in chapter four. Segmenting served a twofold purpose: it allowed the plotting of the computer information in an orderly way, and it permitted a better understanding of the results. Listening to the recordings through earphones, I measured each section three times. The data obtained from these readings was averaged to minimize error. The software data files, indicating tempo per bar, were used to obtain the tempos for the Prelude. During trial measurements, the $\frac{11}{8}$ meter in the Fugue presented a problem for the software *Tempo*. The $\frac{11}{8}$ meter is sub-divided as $\frac{5}{8}+\frac{3}{4}$. The $\frac{5}{8}$ portion is further sub-divided as $\frac{2}{8}+\frac{3}{8}$. Calibrating the software for eleven eight-note beats per bar proved impractical; while setting it for five beats per bar did not yield the correct results. The solution was to use only the files with beat information. Subsequent pasting of the beat data onto a spreadsheet previously programmed to recalculate the tempo for the longer second beat, proved to be an effective way to obtain the average bar tempo for the quarter note. Spreadsheets were also used for averaging section tempos and the duration (in seconds) of the opening bars of the Prelude and the last bar of the Fugue. These spreadsheets are annexed as appendix B

The string version score indicates the duration of the work as fifteen minutes long.[82] The total duration of the performances compared in this study are: Villa-Lobos 10’ 56’’; Tilson Thomas 9’ 39’’; Gerling 9’59’’; Martinez 9’ 30’’. The composer’s own

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82 H. Villa-Lobos, *Bachianas Brasileiras No. 9*, Edition Max Eschig, Paris, 1969.

recording is 4' 4" shorter than the printed time, a clear indication that the duration stated in the score is a miscalculation. The string version score and autograph show the tempo for the Prelude as h = 60, and for the Fugue as q = 90. The vocal version manuscript copy has no indication of tempo while the printed score indicates the tempo for the Prelude as h = 60; but both the manuscript copy and the printed score show the tempo for the Fugue as e = 160.[83] Villa-Lobos's own averaged tempo for the Prelude is h = 32 and for the Fugue exposition it is q = 90. Therefore, it seems logical to deduce that he thought of the tempo for the Prelude as q = 60, and perhaps in a slip of the pen, notated a half note instead of a quarter note. I believe the C time signature indicates the binary character of the phrases; not the tempo for the piece.

The Brazilian conductor Roberto Duarte suggests that mm. 9-14 in the Prelude, and mm. 88-92 in the Fugue, should be repeated because Villa-Lobos adds these repeats in his recording.[84] The string version recordings analysed for this essay do indeed include this repeat. Tilson Thomas also repeats the first half of m. 98. There is no evidence, either in the score or in Villa-Lobos's recording, to support such addition. Initially, I thought that the added half measure was the result of a recording editing mistake. Later, I rejected this idea because multiple tempo readings showed that the repeat was played at a different tempo; indicating a deliberate ritardando design.

The comparison of scores for the vocal and string versions raised questions relating to the influence of the medium and the resulting performances. The vocal version has not been recorded as often as the string version. Martinez's recording was included in this study in order to examine how the vocal medium affects the realization of

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83 H. Villa-Lobos, *Bachianas Brasileiras No. 9 pour orchestre de voix*, Edition Max Eschig, Paris, 1984.

84 Roberto Duarte, *Revisão das Obras Orquestrais de Villa-Lobos* (Niteroi, RJ EDUFF 1989) 97.

the score in matters of tempo flexibility. Her reading does not include any repeats therefore not surprisingly, hers is the shortest. It is intriguing to note, however, that her version is only nine seconds shorter than Thomas's—the fastest string rendition. The reasons for this fact can be seen in the averaged tempo chart (see Table 3).

Prelude Averaged Tempo Chart

		Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Middle Cadence 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Ending 34-37	Average for the piece	Average 1st half	Average 2nd half
Gerling	♩.	25	29	32	28	26	25	25	23	24	22	**27**	28	24
Martinez	♩.	37	36	37	no repeat	31	32	28	27	25	14	**32**	34	25
Tilson Thomas	♩.	39	34	36	36	35	38	31	30	30	24	**35**	36	31
Villa-Lobos	♩.	35	32	31	31	35	29	35	37	27	29	**33**	32	31

Fugue Averaged Tempo Chart

		Exposition 1-28	Episode 1 29-44	Second theme 45-50	51-55	Episode 2 56-68	Molto Allargando 69-70	Re-exp. 72-77	78-81	Grandioso 82-87	All Themes 88-92	93-94	Meno 95-97	Ending 98-99	Average Tempo
Gerling	♩.	96	94	84	62	94	65	97	93	84	93	86	82	39	86
Martinez	♩.	93	88	78	66	85	58	90	80	81	82	76	78	63	80
Tilson Thomas	♩.	99	99	91	55	92	66	97	96	88	87	87	74	36	86
Villa-Lobos	♩.	90	90	73	57	77	48	87	79	69	73	75	63	17	73

Table 3. *Bachianas Brasileiras No. 9*: Averaged tempo charts

Martinez's average tempo, ♩. = 35 in the first half of the Prelude, drops to ♩. = 25 for the second half, thus compensating for the repeat of mm. 9-14 in the string version. Martinez does not repeat mm. 88-91 in the Fugue. Nevertheless, her average tempo for the whole Fugue , ♩. = 80 as opposed to ♩. = 86 for Gerling and Tilson Thomas, brings the total duration of her performance close to that of the faster string versions.

Averaging the tempo for the whole movement indicates the overall pace of each recording. Averaged tempos are not absolute measurements but provide a variable that can be used to compare the recordings. They do not give a clear picture of the flexibility within sections; nevertheless, the average tempos relate to the total duration of the recordings studied.

Villa-Lobos's recording is the longest in total duration. His average tempo for the Fugue is q = 73. He infuses the opening statement of the Fugue with a high energy level that is not sustained throughout. The rhythmic complexities of the episodes seem, at times, to baffle the orchestra, resulting in tentative playing. I believe that the slowing down in his performance is due, at least in part, to insecure playing. Tilson Thomas's and Gerling's similar tempos and duration can be attributed, in part, to the contemporary style of string playing.

Comparing the total duration of these performances indicates their overall pacing, but it shows neither how time is shaped within each section nor how sections relate to each other. Timing fluctuation within a phrase affects how we perceive its direction. Time fluctuation between sections influences how we perceive structure. The following considerations take a closer look at time flexibility both in the Prelude and the Fugue.

Prelude

The opening chord, mm. 1-2, was measured with a digital stopwatch with a precision of one hundredth of a second. Dividing the number of seconds by four gave us the duration of the h. The metronome mark was found by dividing 60 by the duration, in seconds, of the h . This metronome mark is the expected tempo. The actual initial tempo occurs at m. 3 (see Table 3).

Comparing this expected tempo with the actual tempo of the performance shows the degree of flexibility of each performance. The following graphs show the expected

tempo for each performance as a straight line. The curve shows the deviation for each recording.

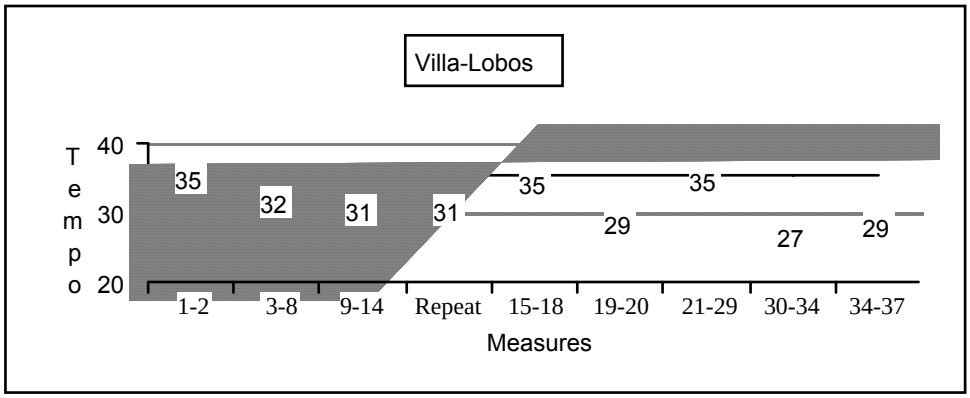

Figure 1. Prelude: Villa-Lobos, expected / actual tempo

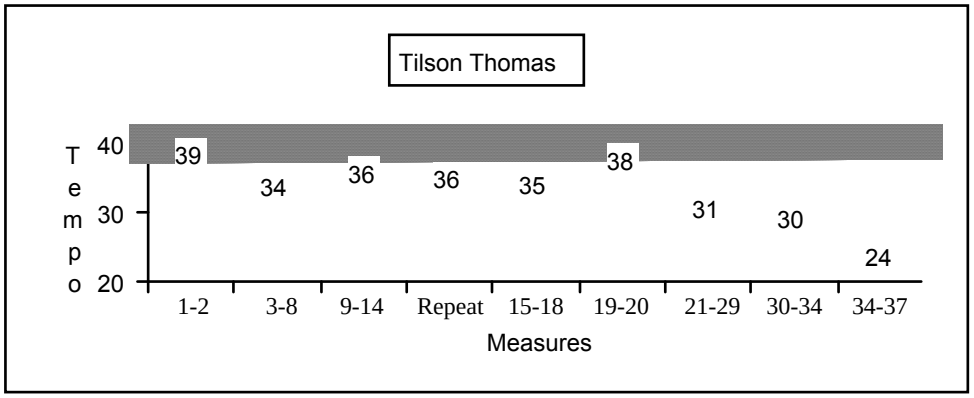

Figure 2. Prelude: Tilson Thomas, expected / actual tempo

Villa-Lobos (Figure 1) starts at h = 35 and returns to the initial tempo for the chromatic descent in mm. 15-18, and at the middle of the chorale in mm. 21-29. The middle-point cadence at m. 19, and the final cadence are played at h = 29. The last measures, starting at m. 32, move forward from h = 27 as a way to connect the Prelude to the Fugue.

Tilson Thomas (Figure 2) starts at h = 39 and gradually slows down to the end. At mid-point of the chorale he returns, momentarily, to h = 38; but as he continues, the tempo slows down again to h =24.

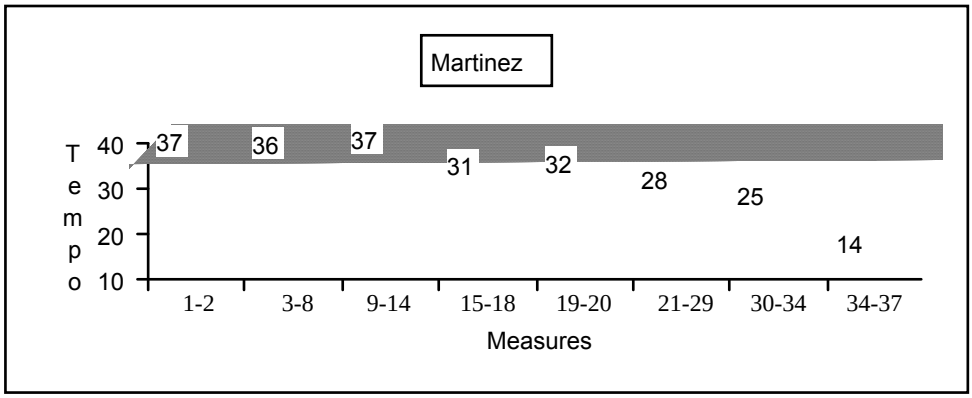

Figure 3. Prelude: Martinez, expected / actual tempo

Martinez (Figure 3) starts at h = 37 and maintains the first half at a very steady pace. The chromatic descent in mm. 15-18 marks the beginning of a gradual slowing down, which continues to the end of the Prelude. It is important to note that due to singers' need for breathing, some of the phrasing breaks are longer than in the instrumental performances; hence, the slower tempos at the end.

Gerling, starting at h = 25, is the slowest (Figure 4). The first half moves forward for the viola solo in mm. 9-14, and relaxes into the middle cadence in m. 19. In this performance it is the chorale, mm. 21-29, which is performed at the expected tempo. The final measures relax into h = 22.

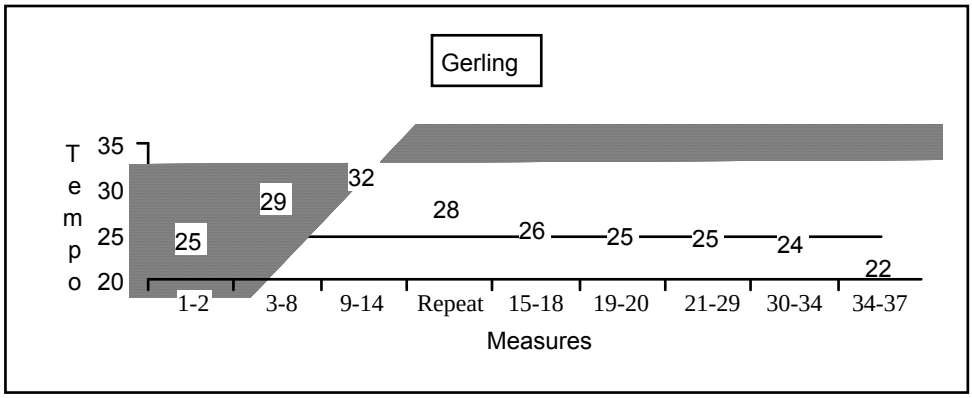

Figure 4. Prelude: Gerling, expected / actual tempo

This comparison shows that all of the recordings use tempo to delineate the structure of the piece. The above graphs show large portions of the piece based on averaged data. The closer one moves to the beat by beat level, the clearer the picture of rubato becomes. Unfortunately the margin of error also increases. Nevertheless, averaging the readings at the beat level, introduces the same amount of 'inaccuracy' in all performances, thus making the comparison feasible.

The graph in Figure 5 superimposes the four performances of the opening theme. Although starting at a very close tempo each performance has a different design. Villa-Lobos shapes the phrase with a continuous thrust towards m. 6 and relaxes at the end. Tilson Thomas and Martinez follow, albeit more flexibly, the same overall design, but at

different tempos. Gerling shapes the phrase as a gentle ritardando with a small upturn at m. 6. All performances speed up in m.6. Gerling's varies only two metronome degrees, while Martinez moves up fifteen metronome steps. Villa-Lobos and Tilson Thomas stay in the middle range with four and seven points respectively.

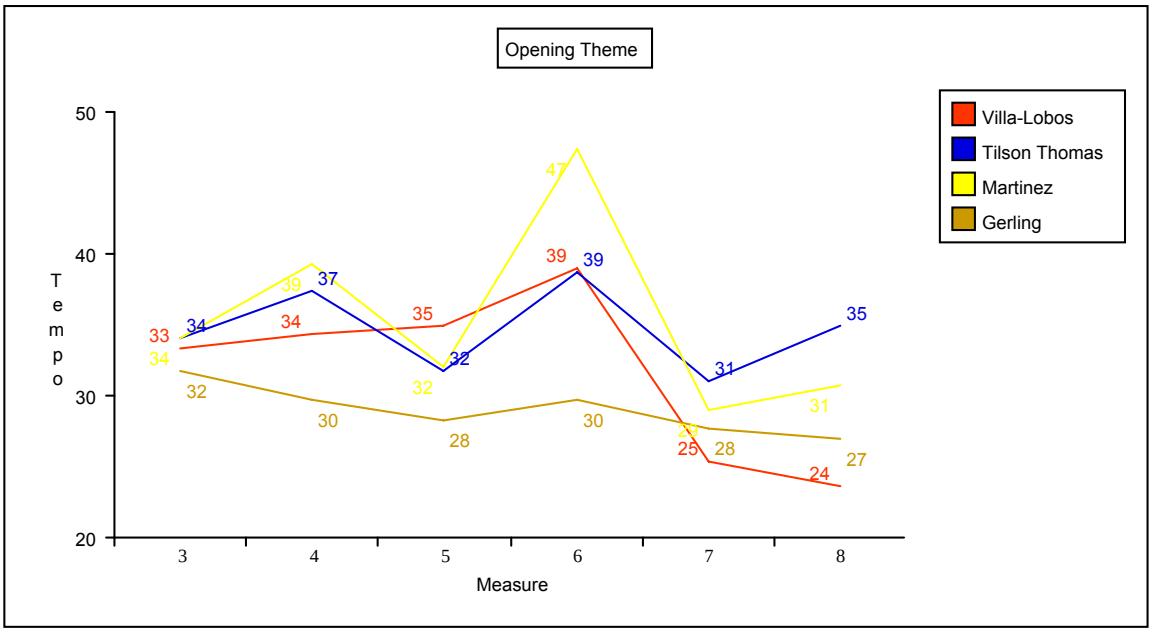

Figure 5. Prelude: opening theme, mm. 3-8

The graph on Figure 6 shows how the four conductors shape the chromatic descent leading into the middle cadence on m. 19. Villa Lobos, contrary to the other three, moves very incisively towards m.16. His tempo fluctuation for this passage, spans eight numbers in the metronome scale from ♩ =32 to ♩ =40. It is the widest deviation for this section in all four performances. Gerling, with a fluctuation of only four metronome numbers, moves towards the cadence, while the others relax into it. It is interesting to

notice that Villa-Lobos ends the phrase at the same tempo in which he started and Gerling ends only one point ahead of his initial tempo. Martinez and Tilson Thomas end at a slower tempo.

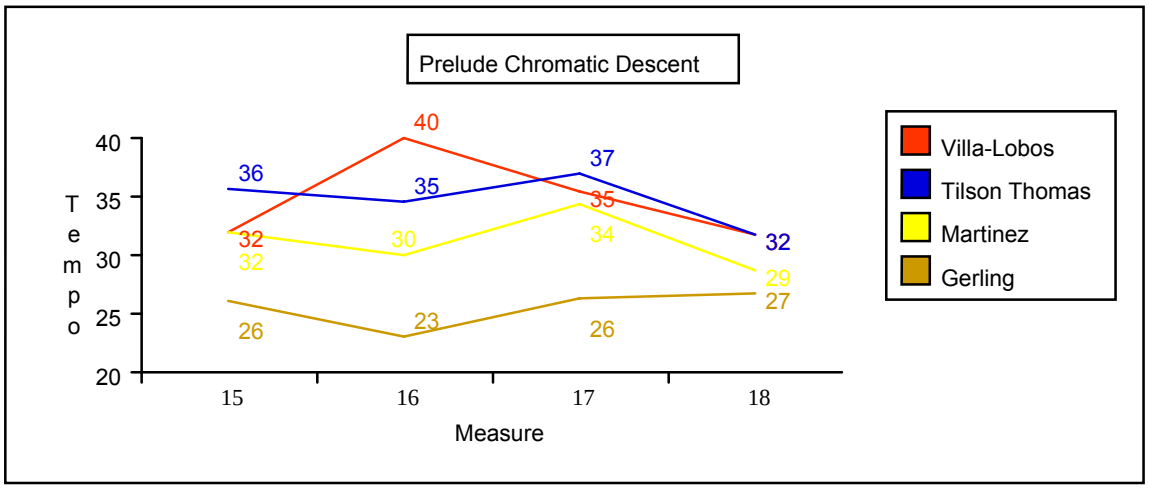

Figure 6. Prelude: chromatic descent, mm. 15-18

The graphs in Figure 7 show the rubato in the chorale section at the beat level. One sees at first sight that all recordings have two low points, m. 22 and m. 25. This indicates that all performances agree on the overall phrasing of the chorale. The first low point, m. 22, represents the division of the first phrase into two groups of two measures each. The lower tip of the curve at m. 25 separates the two phrases and marks the melodic climax. The higher portions of the curve in the graphs show that the second phrase, mm. 26-29, moves forward in all recordings. It is significant that starting at different tempos all recordings follow a similar pace This apparent similarity of pace in all versions of the chorale does not mean that they sound alike. At the beat level, every variation in the curve emphasizes or de-emphasizes a particular beat. Articulation, tone

quality, and subtle nuances of dynamics are coupled with tempo modulations to project the unique character of each one of these renditions.

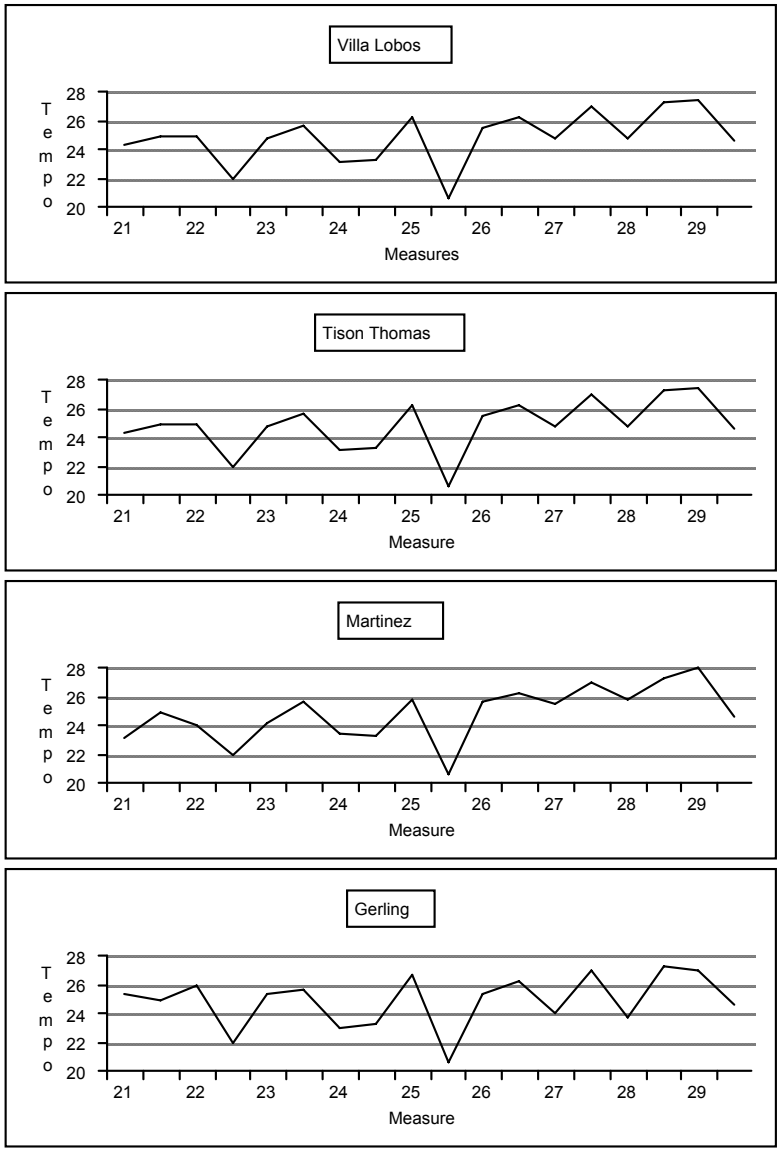

Figure 7. Prelude: chorale, tempo flexibility at the beat level

The score has no indications calling for tempo modification in the above examined segments. The final measures of the Prelude, on the contrary, contains indications for a *poco rallentando* and two fermatas. The graph on Figure 8 shows how each conductor reacts to those indications beat by beat.

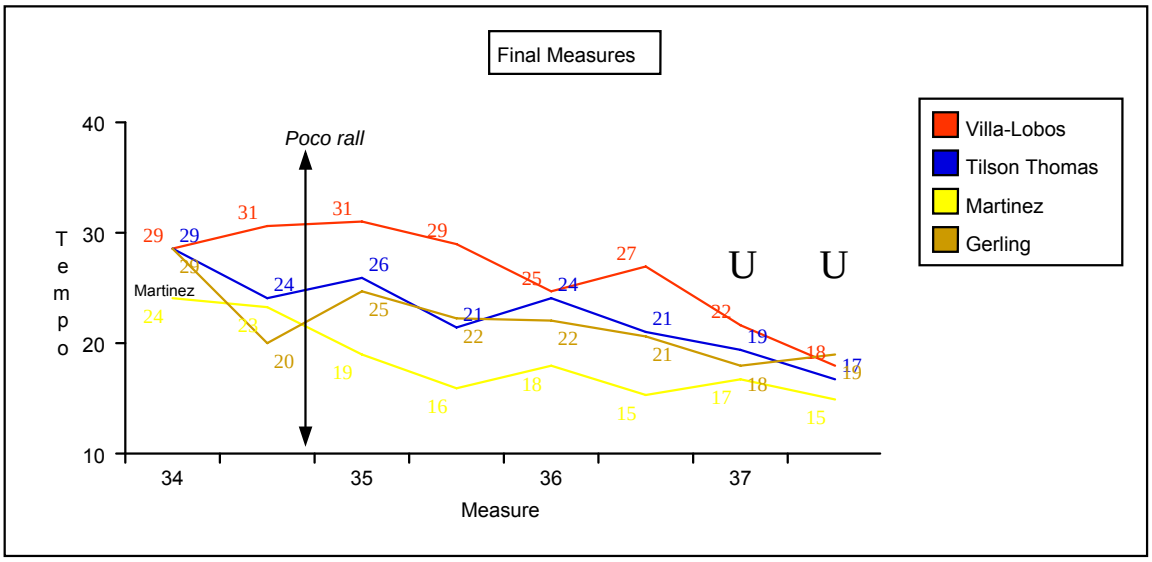

Figure 8. Prelude: final measures

Villa-Lobos is the only conductor starting the poco rallentando where it is indicated. All others are already slower at m. 34. Tilson Thomas and Gerling move forward at the beginning of m. 35 and then slow down. Martinez keeps slowing down towards m. 35. Following a small increase in speed at the beginning of m. 36, her performance of the slow ascending sixth is the slowest of all versions. All performances show a gradual tempo relaxation; in the string version it occurs in the final two measures, while for the vocal version it takes place in the first two measures.

Fugue

The multi-sectional structure of the fugue requires that a study of tempo flexibility deal with each section individually. Nevertheless, a comparison of the actual tempo of each section, vis-à-vis the tempo established at the exposition, is elucidatory of the overall direction of each performance. The average expected tempo for the fugue is firmly established during the exposition—a twenty-eight measure long section with little tempo fluctuation. The following graphs show the average initial tempo as a straight line; the actual tempos are labeled on the curve.

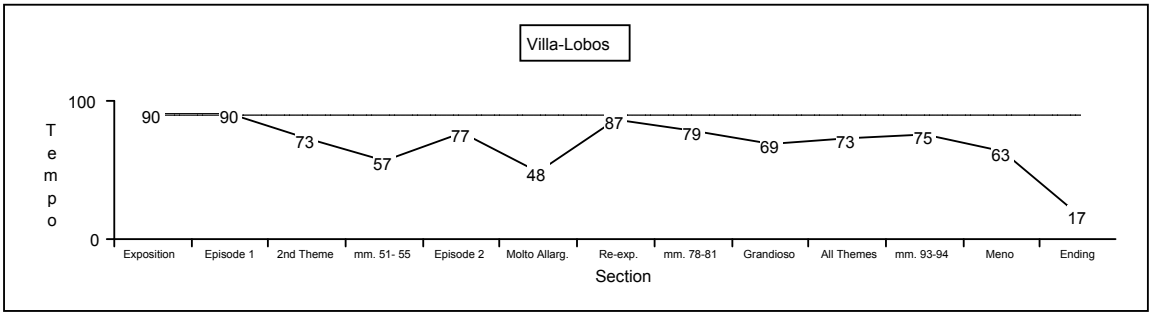

Figure 9. Fugue: Villa-Lobos, initial tempo / actual tempo

Villa-Lobos's exposition and episode I are played at the same tempo (Figure 9). The second theme at ♩ = 73 and episode II at ♩ = 77 are very closely related. The condensed re-exposition is slightly slower than the exposition. The *Grandioso* section is slower than the second theme, while the simultaneous statement of the three themes returns to the same tempo of the second theme. It is interesting to note how the sections balance each other at different levels of tempo. His performance design is characterized by two ritardandos; one starting at the exposition and the other at the re-exposition.

The graph shows that Villa-Lobos uses significant changes of tempo to delineate the character of each section. For instance, a difference of 21 metronome numbers separates the tempo of the exposition from that of the *Grandioso* section.

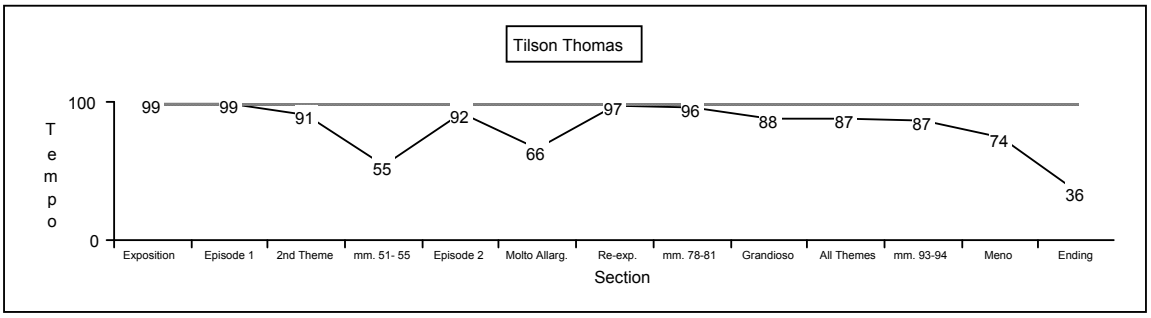

Figure 10. Fugue: Tilson Thomas, initial tempo / actual tempo

Tilson Thomas's performance takes a faster tempo (Figure 10). His average tempo for the exposition and episode I is ♩ = 99. The second theme at ♩ = 91 is only 8 metronome numbers lower. It is noteworthy that in his performance, as in Villa-Lobos's, the second theme and episode II have similar tempos, ♩ = 91 and ♩ = 92 respectively. The re-exposition at ♩ = 97 is, essentially, at the same tempo as the exposition. The *Grandioso* at ♩ = 88 is 11 points slower than the exposition, but still only about half Villa-Lobos's fluctuation for this section. The simultaneous exposition of the three themes at ♩ = 87 is virtually at the same tempo as the *Grandioso*. Tilson Thomas's recording is very close to the expected tempo. The overall tempo design for his performance has three very defined, but narrow, tempo ranges.

The graph for Martinez's performance shows a completely different tempo design from that of the instrumental versions (Figure 11). Martinez maintains episodes I and II

at a faster tempo than the second theme, but at a slower tempo from either the exposition or the re-exposition. The overall tempo design of her performance shows a sharp rallentando after the exposition, and a long slower plateau after the re-exposition. Understandably, the ending in the vocal version is much quicker, due to the singer's breathing constraints.

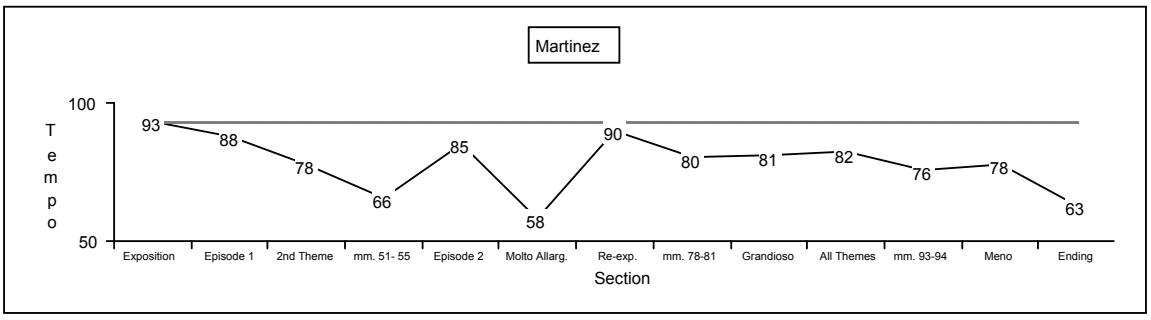

Figure 11. Fugue: Martinez, initial tempo / actual tempo

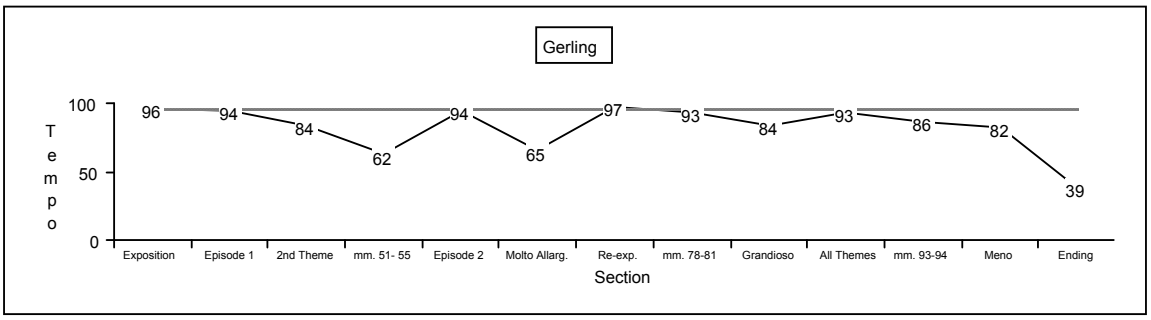

Figure 12. Fugue: Gerling, initial tempo / actual tempo

Gerling's performance, similarly to Tilson Thomas's, is very close to the expected initial tempo (Figure 12). The exposition, the episodes, the re-exposition, and the simultaneous statement of the three themes, all range between ♩ = 97 and ♩ = 93. The second theme and the *Grandioso* are played at the same tempo, ♩ = 84. The design for this performance shows a return to the initial tempo, after the prescribed allargandos.

These graphs show how the performances follow a deliberate tempo design. There is an internal coherence to each conductor's tempo flexibility. It is particularly interesting to note the recurrence of tempos within each performance. These similar tempos connect structurally related sections, projecting each conductor's interpretation in a cohesive manner.

The low points in the above graphs, also show that differences in timing occur at measures between sections. Averaged tempos, however, do not give an accurate picture of phrasing. The Fugue is 99 measures long and its segmented structure suggests that latitude of tempo will be present within sections. The following graphs will take a closer look at each section.

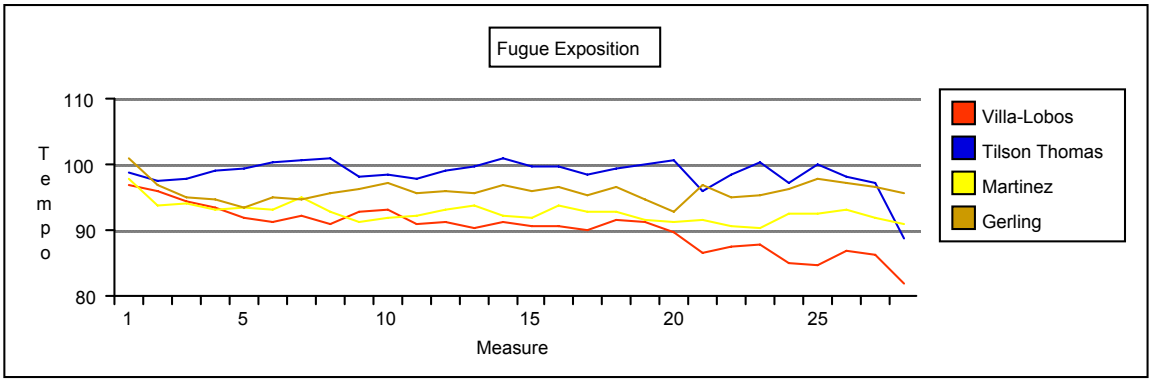

Figure 13. Fugue: tempo fluctuation in the exposition

The data in the above measure by measure graph and the preceding averaged graphs reveal why two recordings sharing an average tempo sound completely distinct. Although all performances start fast and slow down, they differ on the degree of retardation and at which point changes occur. For instance, starting at almost identical tempos, Tilson Thomas and Gerling take opposite directions, and in m. 6 the difference is around 10 metronomic units (Figure 13). Again closer in tempo at m. 10, the parallel curves indicate another drift until m. 20, in spite of a similarity in pacing. At this point, Gerling speeds up while Thomas slows down. Similar opposing trends in tempo are noticeable in Villa-Lobos's and Martinez's performances; in m. 24 the former slows down while the latter speeds up. The falling curve at m. 27 indicates the degree of rallentando used to end the section. Villa-Lobos and Tilson Thomas slow down more than Martinez and Gerling. Villa-Lobos's overall design for the section shows a continuous decrease in tempo, while Martinez gently slows down into the tempo for episode I. Tilson Thomas and Gerling appear to fluctuate more, but at this fast tempo these deviations can be attributed to intense phrasing. As mentioned above, Villa-Lobos's slower tempo at the end could be partially attributed to insecure playing.

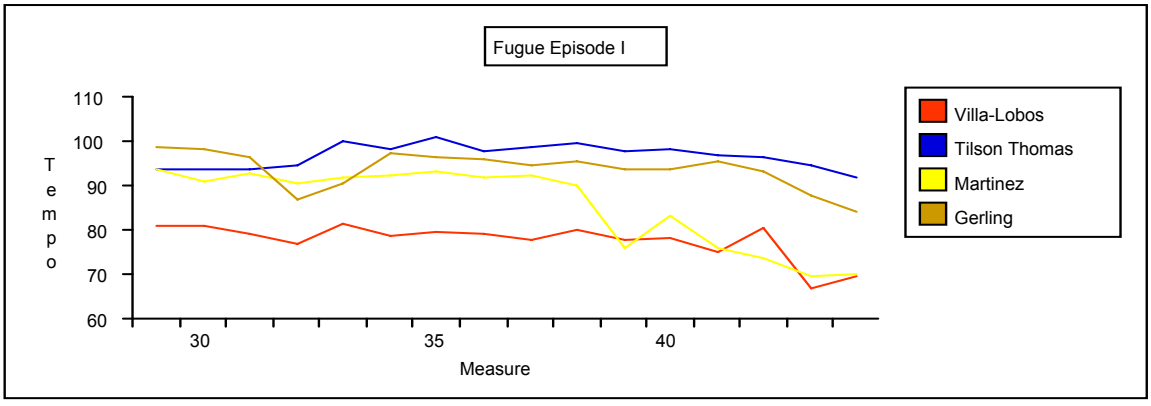

Figure 14. Fugue: tempo fluctuation in episode I

The fragmented nature of the episode allows various interpretations. The graph above shows that each conductor chose a different phrasing for this section (Figure 14). Villa-Lobos and Gerling underline the arrival on Eb major with a ritardando into m. 32. At a faster tempo for the section, Gerling takes more time, but resumes tempo immediately (m. 33-34). Villa-Lobos remains within a narrower range of fluctuations. Tilson Thomas's slight increase in tempo in m. 35 propels the violins through an ascending scale to the first arrival on G^3, the high point of the section. Martinez, on the contrary, decides to bring out the ascending scale leading to the last arrival on G^3, in m. 39. This is an example of how the vocal medium affects interpretation. Martinez's sopranos sing this ascending scale in a most memorable way. Slowing down towards the high note sounds idiomatic for the voices, but Thomas's solution is a better alternative for strings.

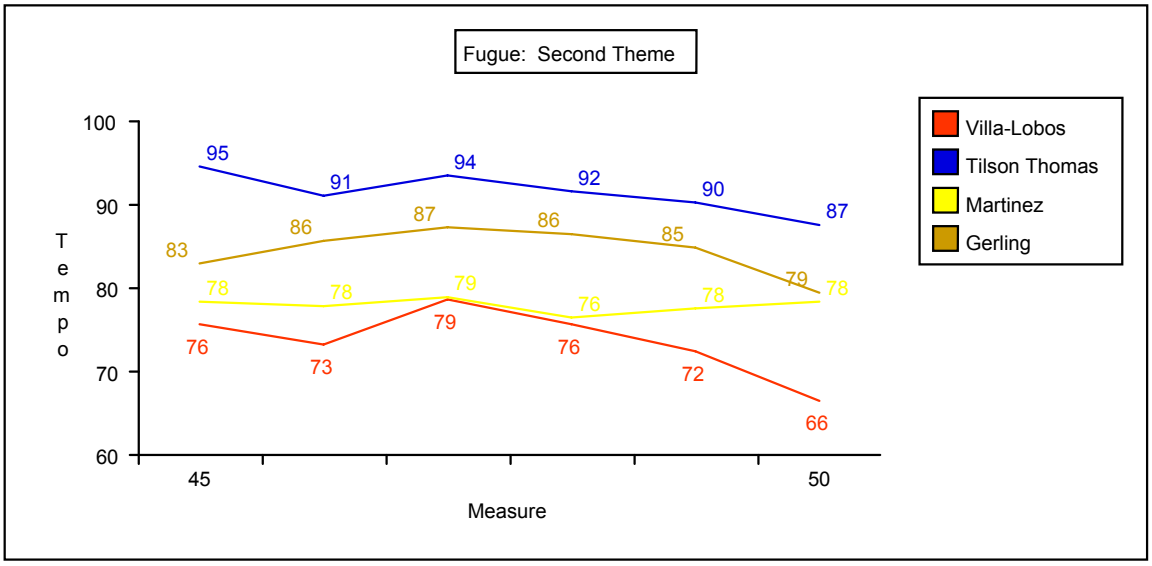

Figure 15. Fugue: tempo fluctuation in the second theme

The phrase structure of the second theme is organized into three groups of three measures each. The graph shows that all performances move towards the middle of the phrase and that the second measure of each group is more relaxed. The gentle curves for Martinez and Gerling show a deviation of only 3 and 4 metronome points respectively. The much more angular curves for Tilson Thomas and Villa-Lobos show that the fluctuation between their fastest and slowest tempos is wider, with 12 and 13 metronome marks respectively. The ending of the section shows another instance where the vocal medium might influence the direction of the phrase. The three instrumental versions slow down at the end, while the vocal rendition moves towards the cadence. It would be interesting to see if other recordings of the vocal version would follow the same pattern.

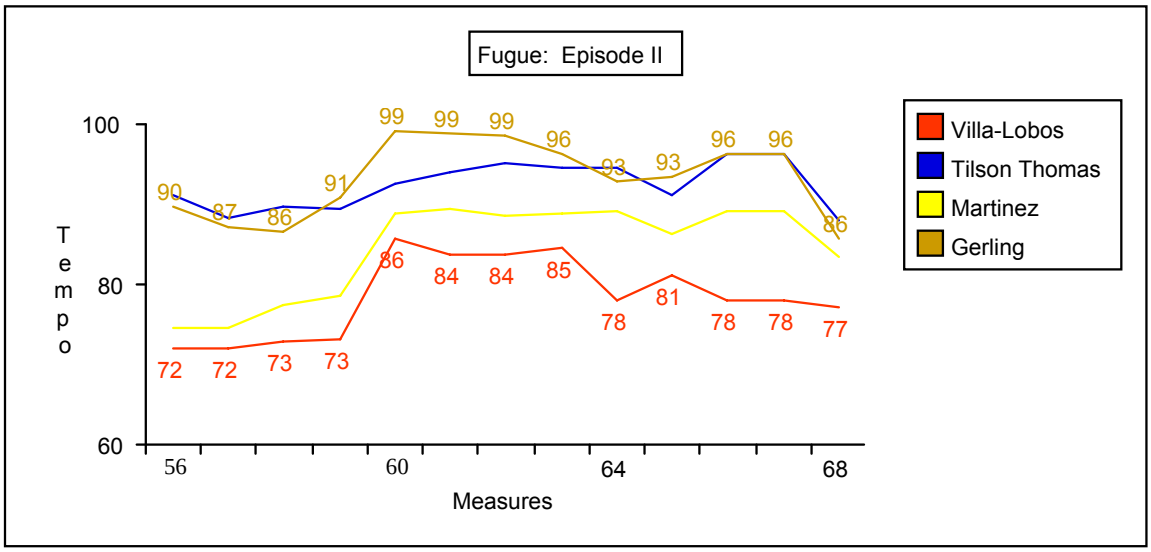

Figure 16. Fugue: tempo fluctuation in episode II

Due to its similar length and structural function to episode I, the short episodes and false entries between mm. 56-68 were considered, for the sake of clarity, as one

section henceforth referred to as “episode II”. The graph in Figure 16 shows that Villa-Lobos’s return to a fast tempo for the middle entry in mm. 60-63 is also present in the other performances. Gerling and Villa-Lobos slow down to introduce the false entry in m. 64, while Martinez and Tilson Thomas slow down at m. 65. At the end of the section, Villa-Lobos is at ♩ = 78. He can maintain this slower tempo during the last four bars because it is compatible with the following *molto allargando*. The other performances, already at faster tempos in m. 67, slow down in preparation for the molto allargando.

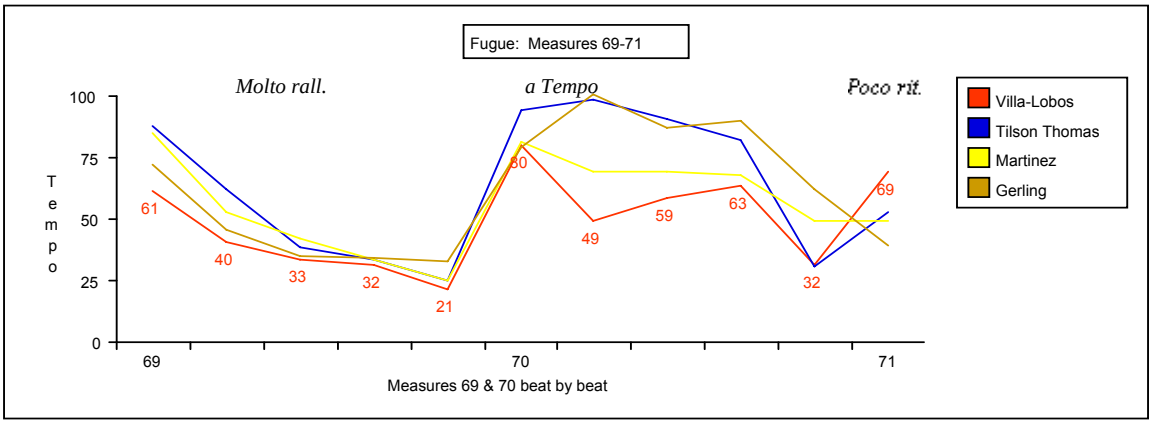

Figure 17. Fugue: mm. 69-70, beat by beat

	m.69					m.70					m.71
Villa-Lobos	61	40	33	32	21	80	49	59	63	32	69
Tilson Thomas	88	62	38	34	25	94	98	91	82	31	53
Martinez	85	53	42	33	25	81	69	69	68	49	49
Gerling	72	46	35	34	33	79	102	87	90	62	39

Table 4. Fugue, mm. 69-71, metronome markings for each beat

The graph in Figure 17 shows a comparative curve of all performances at the beat level for mm. 69-70. It shows the similarity in design in all performances, but the differences between the tempos indicated by the low portions of the curve are so small that they appear to be identical. Table 4 complements the graph, showing the actual metronome marks for each recordings. The above data shows that these four conductors consider the *a tempo* as relating to the prevailing tempo before the molto allargando, not to the initial tempo. Villa-Lobos and Tilson Thomas slow down before the poco allargando. The faster tempo in m. 71 indicates a shorter fermata. Martinez slows down earlier and maintains the same tempo for the last two measures. Gerling is faster at the *a tempo*, but slower in the poco rallentando. This relationship between the amount of rallentando and the length of the fermata is an interesting point. It appears that the less retardation is introduced during the *a tempo* measure, the longer the poco rallentando has to be in order to balance the phrase (Figure 17).

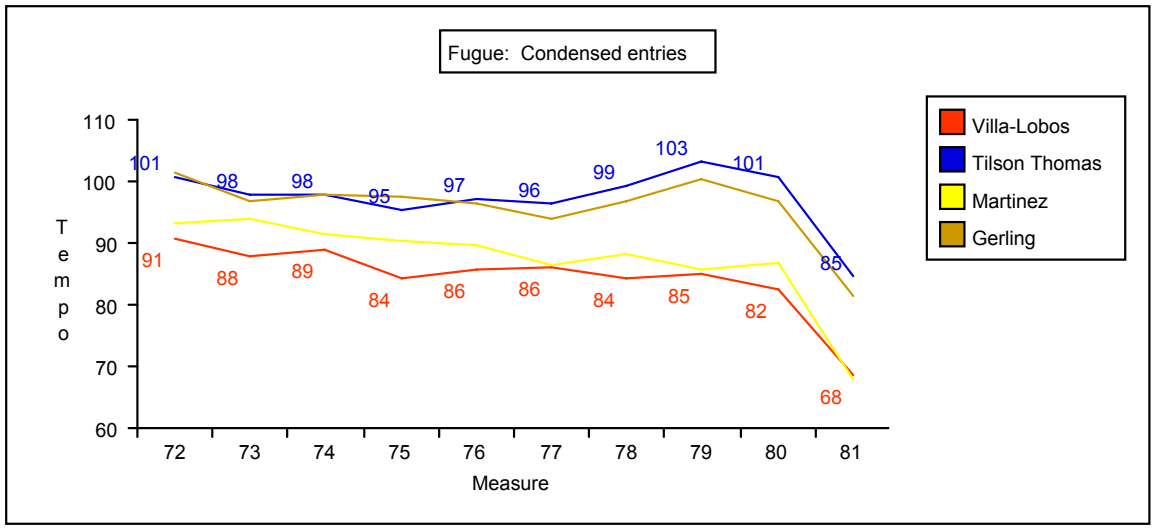

Figure 18. Fugue: tempo fluctuations in the re-exposition

The condensed entries starting in m. 72 function as a re-exposition, and the tempo scheme is similar to that of the exposition (Figure 18). There is an unanimous return to the initial tempo, and the same relaxation towards the end of the section. Villa-Lobos and Tilson Thomas slow down at m. 75 to mark the double bass entrance, while Martinez and Gerling maintain the same pace throughout the end of the re-exposition, m. 77. Villa-Lobos and Martinez continue to slow down during mm. 78-81, while Tilson Thomas and Gerling go back to the initial tempo before plunging down into the *Grandioso.*

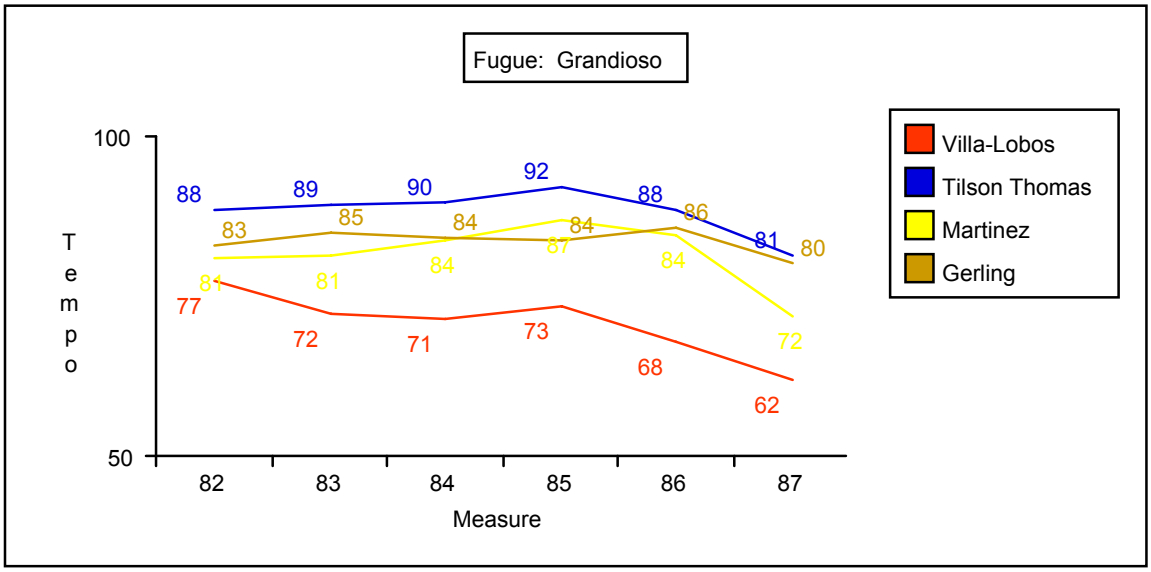

Figure 19. Fugue: tempo fluctuation in the "*Grandioso*"

One must take into account the preceding section in order to understand the unique design of each performance. At this point, the relevant feature to examine is how the indication *Grandioso* (Portuguese for grand, exalted) affects the tempo relationship

between the two sections. Villa-Lobos starts the *Grandioso* at ♩ = 77, considerably slower than his initial re-exposition tempo of ♩ = 91 (Figure 19). Tilson Thomas and Gerling start the re-exposition tempo at ♩ = 101, but at the *Grandioso* the former is at ♩ = 88 while the latter is at ♩ = 83. Martinez stays basically at the same tempo in both sections. There is a definite relationship between the tempos of the exposition and the second theme and those of the re-exposition and the *Grandioso*. This coincidence of tempo is not surprising because, structurally, the *Grandioso* balances the second theme.

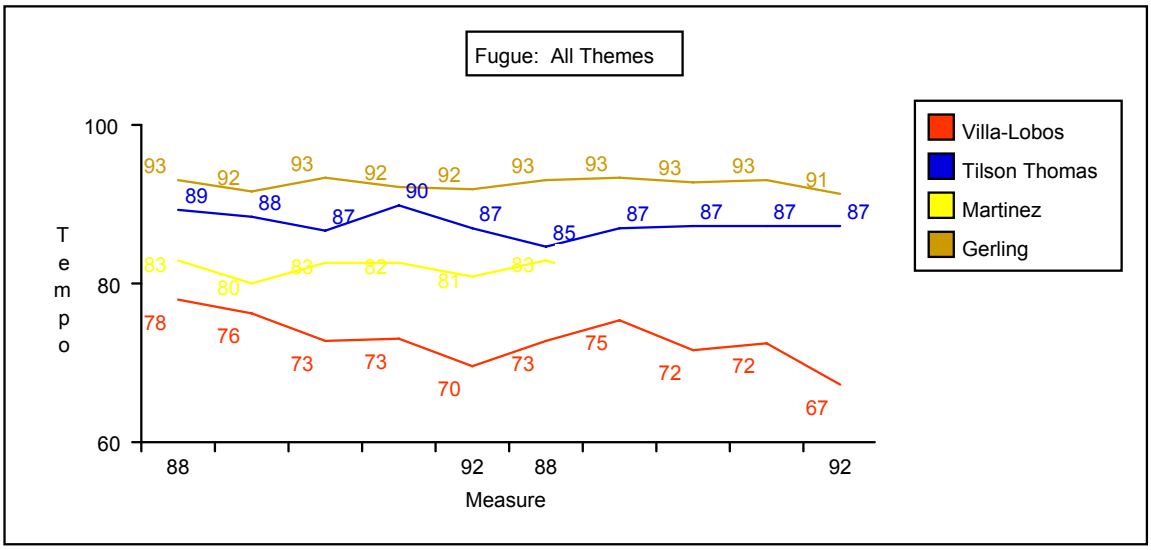

Figure 20. Fugue: tempo fluctuations in the simultaneous statement of all themes

The climax of the fugue is the superimposed presentation of all three themes (Figure 20). The section, marked *a tempo,* is distinctively performed in each of the recordings. Villa-Lobos is the slowest and, as mentioned before, the audible mistakes are a reminder that the performance might not have been according to his wishes. His tempo of ♩ = 78 is close to that of the preceding section, but considerably slower than the

initial ♩ = 90. Martinez and Tilson Thomas take a slightly faster tempo than in the preceding section. Gerling's tempo at ♩ = 93, connects the *a tempo* indication to the initial tempo.

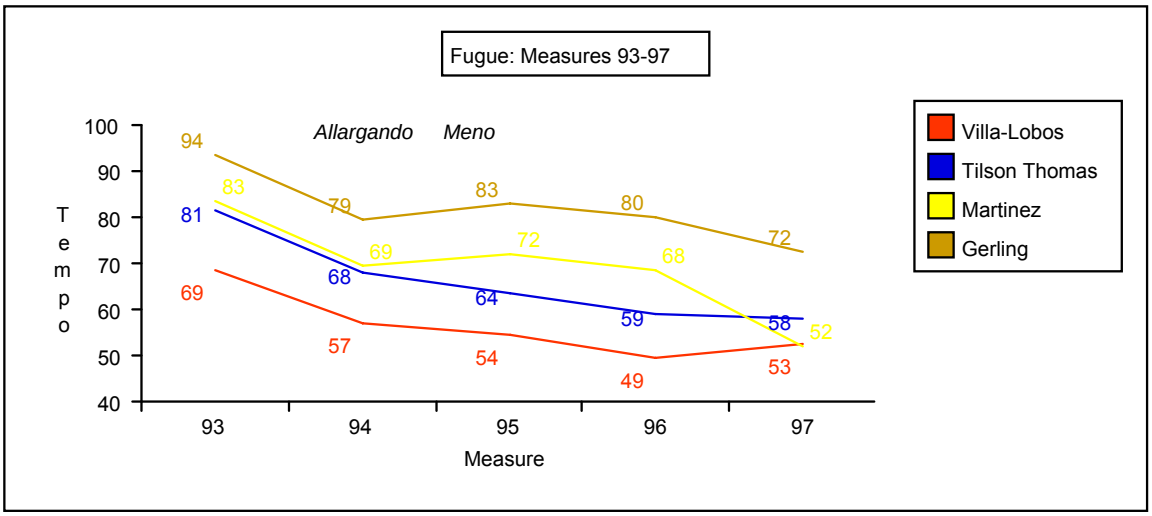

Figure 21. Fugue: tempo fluctuation, mm. 93-97

The parallel lines at the beginning of the graph on Figure 21 shows that, even though starting at different tempos, all conductors slow down for the allargando in m. 94 at almost the same rate. Starting at the slowest tempo, Villa-Lobos continues to slow down to m. 96, and then increases the tempo slightly. Tilson Thomas keeps a steady rate of retardation throughout the section. Gerling and Martinez make a more pronounced allargando in m. 94, but compensate in the opposite direction in m. 95. Villa-Lobos's tempo at the end of these measures is ♩ = 49. This is such a slow tempo that, in order to carry out the final allargando in the following measures, he moves the tempo back up to ♩ = 53 in m. 97. All other conductors continue the allargando through m. 97.

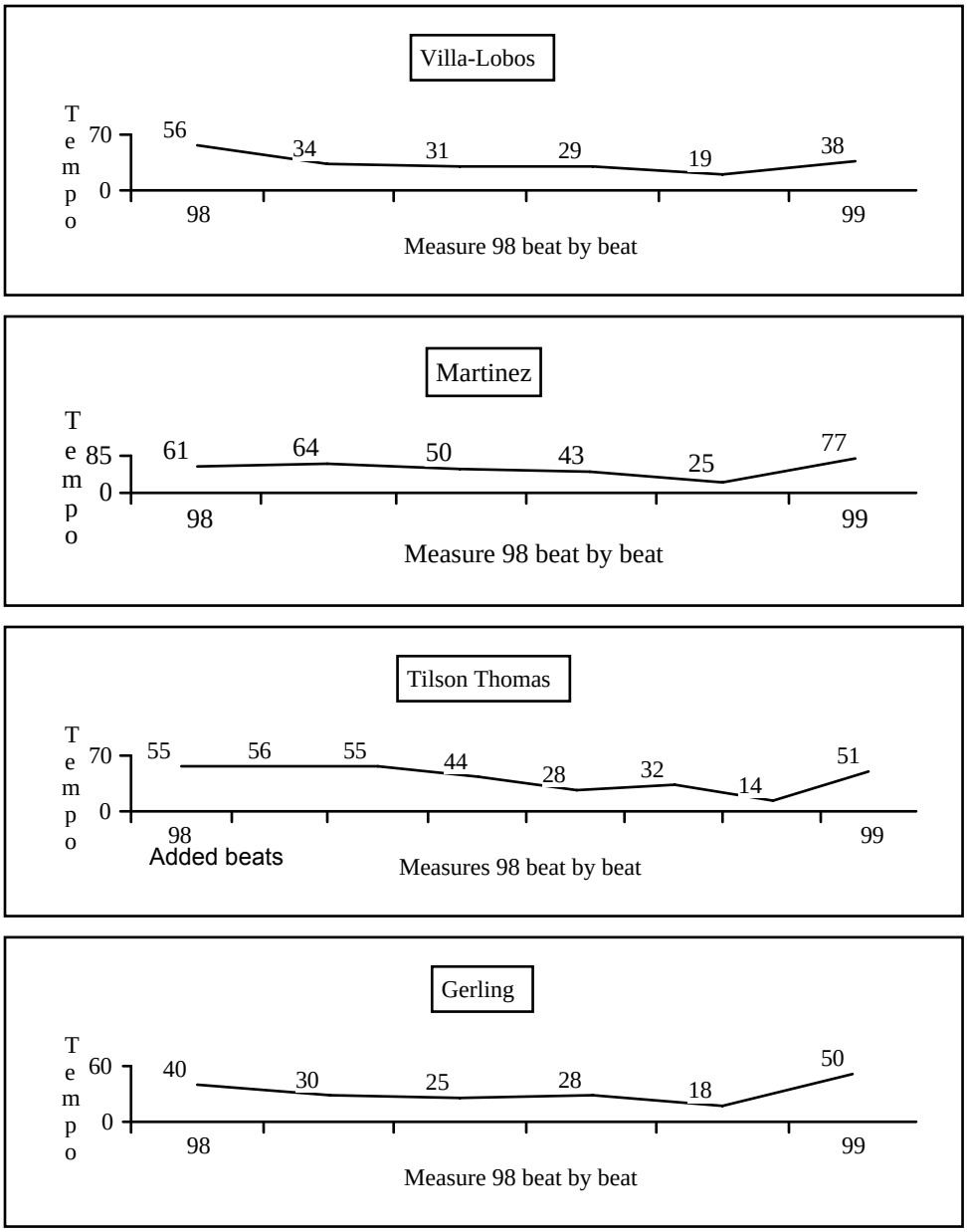

Figure 22. Fugue: tempo fluctuation in the last two measures

Villa-Lobos and Martinez start the final allargando at slightly faster tempos than those ending the *Meno* section. Villa-Lobos, as mentioned above, needs to have room to

slow down. A comparison of the metronome marks in the graphs shows that Martinez, on the contrary, starts at a quicker tempo because her timing design for the ending is, on the whole, faster. The very low tempo, ♩ = 14, at the end of Tilson Thomas's graph reflects a break before the last chord. The graph also shows the deliberate change of tempo in the repetition of the first two beats of the measure. Gerling's ending is the slowest, and he moves the third beat slightly ahead, in the same way as Tilson Thomas. Gerling's option for a slower tempo, and Tilson Thomas's added beats, seem to indicate that both conductors felt the need for an additional time to build the dramatic ending.

Factors such as dynamics, sound quality, and articulation contribute to the uniqueness of each recording. Even when two recordings are very close in tempo, each shows an individual character. In the particular case of the *Bachianas Brasileiras No. 9*, the human voice confers a distinctive characteristic to the vocal version. The singularity of its sound is not limited to the obvious difference in tone quality. The peculiarities and technical possibilities of the human voice also influence matters of articulation and timing. For instance, the octave leap in the penultimate measure of the Fugue sounds more dramatic and idiomatic if sung faster and legato, as in Martinez's performance. After extensive listening of these performances, I came to the conclusion that the repeats added in the string version would be redundant in the vocal version. The scoring for the voice is at the limit of feasibility. Thus, singers must use their full energy as the themes unfold to produce the adequate musical expression. The chorus is certainly capable of nuances that would make the repeat in the Prelude viable, but in the Fugue, the repeat of mm. 88-92 would be too taxing. The string orchestra, free of the physical constraints of breathing, can easily accomplish the repeat, thus adding weight to the climactic exposition of the three themes.

CONCLUSION

Artistic performance involves shaping time at various levels. Tempo flexibility is only one of the elements determining how we listen to music. Its connection to melody, harmony, dynamics, and articulation is paramount. Human reflexes vary for each individual; therefore the tempo readings for this study, obtained through listening and simultaneously tapping on a computer keyboard, include a certain degree of subjectivity. Nonetheless, measuring tempo is far more objective than measuring dynamics and articulations. As noted by Seashore in the epigraph of this essay, a description of every nuance of every performance would be excessive; but tempo flexibility graphs clarify our perception of key elements such as the phrase direction and internal rubato. The curves in the graphs show in a concrete way the many possibilities in which time is utilized to shape the same phrase.

The data collected in this study also shows that all four conductors make use of significant tempo fluctuations, whether or not those tempo changes are indicated in the score. Bowen points out that the tradition of slowing down to indicate the arrival of the second theme is not a contemporary accent (p. 23). The performances analyzed in this study show that Thomas is the only conductor who does not slow down for the second theme. That in itself does not constitute enough evidence either to confirm or deny Bowen's observation. Nonetheless, it raises the question whether Villa-Lobos's slower tempo for the second theme is the result of compositional intent or a compliance to the prevalent performance conventions. Furthermore, should contemporary performers follow the score and maintain the same tempo, or follow the composer's recording and slow down? This leads us to the much broader question of authenticity.

Richard Taruskin, discussing matters of authenticity and performance says that "only complete and certain knowledge is knowledge at all." He believes that creative guesswork is an essential part of the reconstruction of any musical composition and finds support in Roman Ingarden. According to Taruskin, Ingarden considers music to be a "purely intentional object" and "rejects the score for a lack of specificity and performance because of its excessive contingency."[85] That is to say that scores do not supply all necessary data for recreating music, and that performances do not constitute the musical work due to their ephemeral quality. That leaves us with a paradox: music exists before it is notated but has to be recreated from the notation. Notation does not address all the problems of recreation because not all details of the music created in the composer's mind can be properly registered. If performance is too ephemeral to be the musical work, a composer's own performance certainly cannot be considered as the authentic version. What then, is the value of studying a composer's performance?

Decisions regarding performance should be based on knowledge. Taruskin's "creative guesswork" means that when precise information is not available decisions must be based on performers' instincts and experience with the music. Discussing matters of tempo he says that "the difference between a Hogwood and a Mengelberg. . . is a matter of degree", acknowledging that both have to deal with the same issues albeit arriving at different solutions.[86] His statement considering creative guesswork as an integral part of the performance process, does not give *carte blanche* to performers. On the contrary, I believe that he is calling performers to task and demanding that they take full responsibility for their decisions.

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[85] Richard Taruskin, *Text & Act* (New York: Oxford University Press, 1995) 203 and 206

[86] Ibid. 222.

This study shows that Villa-Lobos's version deviates from the score in matters of tempo. At times, his deviations are more pronounced than those of the other three conductors. On the one hand, I agree that the composer's rendition is not an ironclad model that must be followed. On the other hand, I believe that studies such as this can set the ground rules for Taruskin's "creative guesswork". Understanding the composer's own design can unleash creativity while minimizing the guessing component. Let us take as an example the relationship of tempo to events in other parameters.

Narmour's idea about closure in diverse parameters, and its effect on structural perception, was discussed in chapter one, p. 27. His main focus is that closure occurs at different times for each parameter. The graphs in this study provide a linear representation of the parameter tempo. Used in conjunction with the score, these charts may clarify the relationship of timing to other parameters. The need for additional time at the end of the Fugue in both Thomas's and Gerling's performances for instance, can be tied to an interpretative decision to bring out the chromatic descending line. (See p. 103)

Graphs for the sections involving rallentandos and fermatas show that these events are directly related to the prevailing tempo. Therefore, it is not advisable to imitate a performance without understanding the reasons compelling an artist's decision. Epstein's discussion of the cubic curve, and its effect on our perception of timing, shows that we consider performances that fall within the curve as more musical. (See p. 31) The graphs in this study are not cubic curves as those in Epstein's study. Yet, they also present a visual representation of a performance. Thus, comparing the score with the graphic representation of its performance can reveal why we prefer one performance over another.

A recording is only a register of one performance at a single moment. Therefore, Villa-Lobos's live recording was considered one possible rendition of the work. Not all

performances are equally successful, but deciding the meaning of "successful" is subjective. Unlike Narmour's analysis, this study did not compare performances to find the single correct one. Besides, the inclusion of my own recording in the study would taint any conclusions regarding correctness of interpretation.[87] This does not mean a lack of opinion; on the contrary, I can offer justifications for each one of my interpretative decision. I believe the same is true for all other conductors. My argument is that performers must undertake a rigorous study of scores and performances. It is only after studying a work in depth, that the performer earns the right to develop personal convictions.

It is the ephemeral quality of performance that gives rise to controversies. Two listeners may display opposite reactions to the same expert performance, sometimes with almost religious zealousness. The decision as to which one is the better is often a matter of personal conviction. A performance is an affirmation of the performer's beliefs. The comparative study of performances can serve as a test for the performer's interpretative decisions, as a strengthening tool for his/hers ideals, and as a basis for justifying the choice of one performance over another. I have strived to apply Kolisch's principles of score reading to my work as a performer. I do believe that an accurate score is the best source for the preparation of a performance. Scores, however, are not always accurate and never complete in regard to all of the fine details involved in artistic performance. This means performers have to make decisions. For me, Kolisch's idealistic performance principles have served as a reference whenever faced with conflicting choices.

Checking interpretative decisions against those of the composer-performer or

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87 A future experiment could involve the participation of an expert panel in a blind study to judge recordings as to their accuracy in relation to the score, their degree of expressiveness and overall success as performances.

other performers tests one's reading of the text. The decision to change or maintain a reading depends on the persuasiveness of alternative readings. It is the performer who, ultimately, decides which answer to accept. On the one hand, performers must believe in their reading of the score; but, on the other hand, they must keep an open mind. Complex questions lead to complex answers. Score reading often yields more questions than answers. Performers must accept that *their own* reading of a score must be continuously questioned and revised. Acknowledging this principle prevents dogmatic opinions. Ironclad faith in the letter of the score or in one's own reading generates lifeless performances. An inquisitive process of score reading such as described in this essay, on the contrary, builds confidence in one's score-reading ability; the multiple solutions to interpretative problems, found through the comparison of recordings, open the performer's mind, leading to creative performances.

APPENDIX A

BACHIANAS BRASILEIRAS NO. 9: REHEARSAL PLAN

The following rehearsal plan presents my own ideas for the performance of this work. It is offered as an example of how the many aspects of the data obtained in the study of a score may be organized into a practical set of solutions.

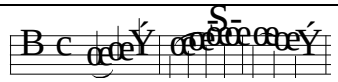
The suggestions presented here are by no means exhaustive or definitive, but rather a set of decisions that make up one performance design. It is based, in part, on my annotations on the score used for the recording with the *Orquestra de Câmara Theatro São Pedro*. It also includes new ideas extracted from the findings described in the preceding essay. I believe that the comparison of the two versions of this work and the comparison of recordings may stimulate conductors to find a variety of solutions.

The alternative divisi, suggested in the following remarks, may solve many balance problems. In order to save a great deal of rehearsal time, all of the optional recommendations should be marked in the musicians parts prior to rehearsals. These suggestions may be most helpful for conductors dealing with small orchestras with players of uneven technical skills. I consider an orchestra constituted of six 1st violins, six 2nd violins, four violas, four cellos and one bass as a small ensemble.

I want to acknowledge Professor James Dixon's rehearsal notes on Beethoven's symphonies as the model for the following observations.

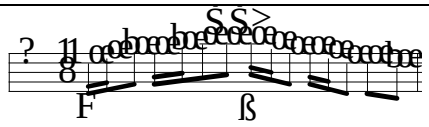
Prelude

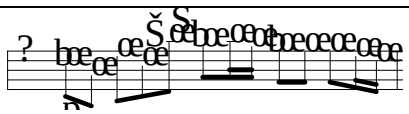
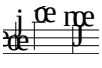
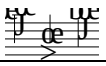
Measure	
1	Assign 2/3 of 1st and 2nd vlns to the upper part. g4 in 1st vlns will sound better if played as an artificial harmonic with no accent starting up-bow. Eighth-note chord: fast full bows. Add at least one extra player to the B♭ in the 2nd vlns.

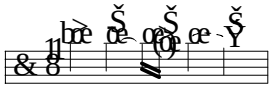
3	Cellos should enter with no accent. Violas *sul tasto* but with vibrato to bring out mysterious quality.
4	Violas, bowing 
5	Cellos should enter with no accent.
7	2nd vlns definite accent. Violas slight accent at end of crescendo
8	Basses with definite accent
9-14	Solo viola: more focused tone than tutti at m. 3, repeat can be either softer or louder; timing design may change. Basses may sustain C through m. 14 for the repeat to avoid an extra attack. (Villa-Lobos does not, but Thomas and Gerling do)
15-18	In small groups one 1st vln B can play mm. 15 -16 one octave lower for a richer tone quality. Very slight breaks after mm. 15 and 16. Connect mm. 17 and 18 and add a slight crescendo in m.18 to lead the phrase into the cadence. Bring out 2nd vlns B with slight accents.
20	Cellos and Basses should enter quite strongly and relax for the entrance of the chorale.
21-25	Rich tone, develop the phrase towards end of m.24. Bring out moving inner voices. Connect m.24 and 25. Bring out basses on down beat of m.25. Phrase break after m.25.
26-29	Use bass ee in mm. 26 and 27 to move forward. Treat m. 28 and 29 as a 4/2 hyper-measure. Lead into the ß in m.30 with a slight ritardando. In m. 28 -29: assign more 2nd vlns to lower part.

30-33	Fast ≥ for the ß. Bring out basses, if less than three basses its better to use only one. Crescendo during qq in m. 32 and decrescendo on the w.
34-37	Sound should be rich to allow for the decrescendo. Bring out violas in m. 34 and cellos in m. 35. Viola and cello divisi in m. 36 can be played as solo by the principals rather than inside players, otherwise the ascending figure should be played by a larger number of players than the sustained notes. Note the re-articulation, in m.37, Bb in lower violas, and D in lower 2nd vlns, while upper 2nd vlns changes from A to Ab. The diminuendo in these sections should be delayed until after the changes of pitch. The Fugue should follow *attacca.*

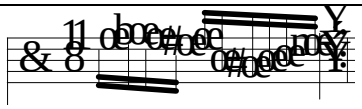
Fugue

Measure	
1-4	 Bowing for beginning of theme always as shown above, remainder of theme should be played as it comes. Villa-Lobos's ß are very strong. Space (lift bow) between all repeated notes. Lower strings should play *collé* stroke in the lower half. Upper strings on low register should also play in the lower half of the bow, as the theme moves into higher registers play *martelé* in upper half of bow.

5-8 [2]	Bowing for counter-subject :  Counter subject should be played with a light brush stroke to keep a bouncing character. Slight accents on quarters in m. 7 and 8:  
9 [3]	Basses entrance. Balance carefully so violas are lighter than cellos.
13 [4]	With small groups use all 2nd vlns for theme statement.
14	Bring out imitation on violas, cellos and bass. Passage should sound as a continuous line. Bass indicated as solo in printed score; not in the manuscript.
16	Slight decrescendo for 2nd vlns at end of bar.
17 [5]	All 2nd vlns on upper part. (violas play the A♭)
18-19	In small groups assign only one viola to the lower part and balance the voices with the dynamics of cellos.
20	Eliminate viola lower part
21-22 [6]	All violas, not only half, eliminate cellos divisi if violas are strong enough.
23	All violas.
25	Bass and cello entrance. Villa-Lobos interrupts the 1st vlns octave doubling for only one measure. This might be a miscalculation of orchestration.
29-30	Violas to the fore. Balance chords with stronger E♭ lower 2nd vlns.
31-32	Difficult ensemble passage for violas, cellos, and basses. Each section should do a slight crescendo to connect the line. Slight ritardando at end of measure to mark end of section.

33-34	Equal number of violins for each of the three parts. (Lower 1st and upper 2nd are identical)
35	Resume normal divisi.
37	Ensemble is rhythmically difficult. Take care of 2nd vlns.
38	In small ensembles the whole 2nd vlns. section can play both entrances. Give the g to the violas.
39-40	All 2nd vlns on upper part
41-42	2nd vlns, in small groups only two players sustain the g, all others play the moving sixteenth-note line.
45-50	Bowing:  no accent on last two notes (it must sound legato). Upper cellos, lower 2nd vlns and violas: stronger for richer sound. Play the first of the sixteenth-notes at the end of bar with a slight accent, in small groups use extra cellos for these notes. Upper 2nd vlns and violas play with broad *detaché* strokes.
51-52	Maintain tempo. In small groups use all 2nd vlns for the lower part, assign upper part to 1st vlns.
53	Cellos and basses eighth-note triplet sets the pulse for the 6/8 measure (m.54). In Villa-Lobos's recording the rhythms in both measures sound identical.
55	Dictate q. , no decrescendo for violas and basses.
56	All 2nd vlns on upper part. E b should be assigned to the violas.
57	All 2nd vlns on upper part. E b should be assigned to the 1st vlns. Precise eight-note rest for rhythmic clarity. Delay viola crescendo to the third beat.

58	The eight-note E in the violins is tied in the vocal version. Although articulated in Villa-Lobos's recording I am inclined to consider that it was a slip of the pen in the transcription. See m. 60. Cue cellos and basses precisely.
60-63	Bass entry. In small groups it must be solo. Precise cues for short notes specially on m. 63.
64	Phrase on 2nd vlns moves towards C, articulate the grace note with energy. Bouncy and decisive eight-notes in the cellos. Basses tutti.
65	Connect sixteenth notes in cellos, violas and basses to form a continuous line.
66-67	All 2nd vlns on lower part, assign upper part to 1st vlns.
68-69	Up beat on basses must be very strong to generate momentum to the ascending scale which leads to the molto allargando. Violas in tempo, play on lower half of bow. 2nd vlns play *detaché* to prepare broad strokes on 1st vlns. The ritardando in m. 70 must be very broad, sub-divide in eight-notes.
70-71	The ß should sound like the beginning of the Prelude, one fast down bow and a slow up bow. The *a tempo* relates to the initial tempo of the Fugue. All 2nd vlns on upper part the E should be assigned to the violas. Notes for 2nd vlns and violas change at end.
72-77	Theme should be played as in the opening. Accompanying line needs space between notes to sound rhythmically precise.

78-81	Take care of accents. All voices with a bouncy feeling. All 1st vlns play mm. 80-81, 2nd vlns play only the lower part until three quarter notes before the end of m. 81. Bow stroke should be more on the string as the tempo broadens at the end of m. 81
82-87	Upper 1st vlns and upper Cellos: very legato. Lower 1st vlns, lower 2nd vlns and upper viola: well articulated. Upper 2nd vlns and lower violas: should have two thirds of the available players of each section, articulation as in the opening of the fugue. Balance is paramount for this passage. Experiment with the number of players for each part.
88-94	The *a tempo* indicates a return to the initial tempo of the fugue, not to the broad tempo of the *Grandioso*. All voices well articulated. The theme almost percussion like. Violas, in m. 93, should play with a heavy brush stroke on lower half of bow changing into *detaché* for the allargando at end of m. 94. Violins: make a space before last sixteenth note.
95	Ensemble at end of measure: 2nd vlns should change tied sixteenth-note into a rest.
96	All 2nd vlns in lower part, assign upper part to 1st vlns.
97	2nd vlns may play the following:  All 1st vlns on lower part

98-99	All 2nd vlns in lower part. All violas on lower part in the second half of measure. Assign the g on the viola part to 1st vlns. One cello may double the violas in the second half of the measures for a stronger sound. Very broad second half of the measure. Dictate every note, but slide into last measure with no break to show descending leading tone D♭ to C

APPENDIX B

SPREADSHEETS USED TO GENERATE TEMPO GRAPHS

Prelude Averaged Tempo Chart

		Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Middle Cadence 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Ending 34-37	Average for the piece	Average 1st half	Average 2nd half
Gerling	♩=	25	29	32	28	26	25	25	23	24	22	**27**	28	24
Martinez	♩=	37	36	37	no repeat	31	32	28	27	25	14	**32**	34	25
Tilson Thomas	♩=	39	34	36	36	35	38	31	30	30	24	**35**	36	31
Villa-Lobos	♩=	35	32	31	31	35	29	35	37	27	29	**33**	32	31

Prelude Tempo Chart I

Recording												
Gerling			Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Transition 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Last bars 34-37
	First Reading		9.70	29	31	28	26	25	25	23	25	22
	Second Reading		9.70	29	31	28	26	25	25	23	24	21
	Third Reading		9.60	29	33	29	26	26	25	23	24	22
	Average Reading		9.67									
	Expected tempo	♩=	25	25	25	25	25	25	25	25	25	25
	Actual tempo	♩=	25	29	32	28	26	25	25	23	24	22
	Average tempo		26									
Recording												
Martinez			Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Transition 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Last bars 34-37
	First Reading		6.50	35	38		31	32	28	26	25	15
	Second Reading		6.60	36	37		31	32	29	27	25	14
	Third Reading		6.60	36	36		31	32	28	27	25	14
	Average Reading		6.57									
	Expected tempo	♩=	37	37	37	37	37	37	37	37	37	37
	Actual tempo	♩=	37	36	37	No repeat	31	32	28	27	25	14
	Average tempo		30									
Recording												
Tilson Thomas			Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Transition 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Last bars 34-37
	First Reading		6.20	34	36	36	35	38	31	29	30	24
	Second Reading		6.20	35	37	35	34	38	31	31	30	24
	Third Reading		6.20	34	36	35	35	38	31	29	30	24
	Average Reading		6.20									
	Expected tempo	♩=	39	39	39	39	39	39	39	39	39	39
	Actual tempo	♩=	39	34	36	36	35	38	31	30	30	24
	Average tempo		33									

Prelude Tempo Chart II

Recording												
Villa-Lobos			Opening 1-2	Theme 3-8	Viola Solo 9-14	Repeat	Chrom. descent 15-18	Transition 19-20	Chorale 21-29	Melodic climax 24	Bass soli 30-34	Last bars 34-37
	First Reading		6.7	32	31	31	35	28	35	37	27	28
	Second Reading		6.8	32	31	31	35	29	35	36	27	29
	Third Reading		6.8	32	31	30	34	30	35	38	27	28
	Average Reading in seconds		6.8									
	Expected tempo	♩=	35	35	35	35	35	35	35	35	35	35
	Actual tempo	♩=	35	32	31	31	35	29	35	37	27	29
	Average tempo		32									

Prelude mm. 3-8

	Measure			3	4	5	6	7	8
Recording			Average tempo						
Gerling	First Reading	♩=	29	33	29	29	29	28	25
	Second Reading	♩=	29	31	30	28	30	27	30
	Third Reading	♩=	29	31	30	28	30	28	26
	Average all readings	♩=	29	32	30	28	30	28	27
	Measure			3	4	5	6	7	8
Recording			Average tempo						
Martinez	First Reading	♩=	35	33	39	32	47	29	30
	Second Reading	♩=	36	31	44	31	48	29	31
	Third Reading	♩=	36	38	35	33	47	29	31
	Average all readings	♩=	35	34	39	32	47	29	31
	Measure			3	4	5	6	7	8
Recording			Average tempo						
Tilson Thomas	First Reading	♩=	34	34	38	31	40	30	34
	Second Reading	♩=	35	34	38	32	38	33	34
	Third Reading	♩=	34	34	36	32	38	30	37
	Average all readings	♩=	35	34	37	32	39	31	35
	Measure			3	4	5	6	7	8
Recording			Average tempo						
Villa-Lobos	First Reading	♩=	32	33	36	34	39	26	23
	Second Reading	♩=	32	35	32	36	39	26	23
	Third Reading	♩=	32	32	35	35	39	24	25
	Average all readings	♩=	32	33	34	35	39	25	24

Prelude mm. 9-14

	Measure			9	10	11	12	13	14	12 Com
Recording			Average tempo							
Gerling	First Reading	♩=	34	31	34	37	22	34	32	33
	Second Reading	♩=	33	31	35	35	22	33	32	33
	Third Reading	♩=	33	33	33	34	22	33	33	33
	Average all readings	♩=	33	32	34	35	22	33	32	33
	Measure			9	10	11	12	13	14	12
Recording			Average tempo							
Maertinez	First Reading	♩=	38	35	40	41	23	33	44	34
	Second Reading	♩=	37	33	44	40	22	36	34	33
	Third Reading	♩=	36	31	46	43	23	34	30	34
	Average all readings	♩=	37	33	43	41	23	34	36	34
	Measure			9	10	11	12	13	14	12
Recording			Average tempo							
Tilson Thomas	First Reading	♩=	36	37	37	37	24	34	33	36
	Second Reading	♩=	37	37	36	37	25	40	33	38
	Third Reading	♩=	36	36	36	38	24	36	32	36
	Average all readings	♩=	36	37	36	37	24	37	33	36
	Measure			9	10	11	12	13	14	12
Recording			Average tempo							
Villa-Lobos	First Reading	♩=	31	33	35	33	23	32	20	34
	Second Reading	♩=	31	33	35	34	23	24	24	34
	Third Reading	♩=	31	34	35	33	23	24	24	34
	Average all readings	♩=	31	33	35	33	23	27	23	34

Prelude mm. 15-18

	Measure			15	16	17	18
Recording			Average tempo				
Gerling	First Reading	♩=	26	26	23	26	28
	Second Reading	♩=	26	26	23	27	26
	Third Reading	♩=	25	26	23	26	26
	Average all readings	♩=	26	26	23	26	27
	Measure			15	16	17	18
Recording			Average tempo				
Martinez	First Reading	♩=	31	32	30	34	29
	Second Reading	♩=	31	32	30	35	28
	Third Reading	♩=	31	32	30	34	29
	Average all readings	♩=	31	32	30	34	29
	Measure			15	16	17	18
Recording			Average tempo				
Tilson Thomas	First Reading	♩=	35	35	35	38	31
	Second Reading	♩=	34	35	34	36	32
	Third Reading	♩=	35	37	35	37	32
	Average all readings	♩=	35	36	35	37	32
	Measure			15	16	17	18
Recording			Average tempo				
Villa-Lobos	First Reading	♩=	35	32	42	36	31
	Second Reading	♩=	35	32	39	35	33
	Third Reading	♩=	34	32	39	35	31
	Average all readings	♩=	35	32	40	35	32

Prelude mm. 19-20

	Measure			19	20	m. 20 beat 1	m. 20 beat 2
Recording			Average tempo				
Gerling	First Reading	♩=	25	29	21	25	19
	Second Reading	♩=	25	29	21	25	19
	Third Reading	♩=	26	30	21	25	18
	Average all readings	♩=	25	29	21	25	19
	Measure			19	20	m. 20 beat 1	m. 20 beat 2
Recording			Average tempo				
Martinez	First Reading	♩=	32	32	32	32	32
	Second Reading	♩=	32	32	33	32	34
	Third Reading	♩=	32	31	33	33	32
	Average all readings	♩=	32	32	33	32	33
	Measure			19	20	m. 20 beat 1	m. 20 beat 2
Recording			Average tempo				
Tilson Thomas	First Reading	♩=	38	39	38	38	37
	Second Reading	♩=	38	40	36	37	35
	Third Reading	♩=	38	39	37	38	36
	Average all readings	♩=	38	39	37	38	36
	Measure			19	20	m. 20 beat 1	m. 20 beat 2
Recording			Average tempo				
Villa-Lobos	First Reading	♩=	28	25	32	31	32
	Second Reading	♩=	29	26	32	30	36
	Third Reading	♩=	30	27	32	29	36
	Average all readings	♩=	29	26	32	30	35

Prelude (Chorale) mm. 21-29

	Measure			21	22	23	24	25	26	27	28	29
Recording			Average tempo									
Gerling	First Reading	♩=	25	27	24	25	23	23	26	25	25	26
	Second Reading	♩=	25	24	24	25	23	23	26	25	26	25
	Third Reading	♩=	25	24	24	25	23	24	25	25	25	27
	Average all readings	♩=	25	25	24	25	23	23	26	25	25	26
	Measure			21	22	23	24	25	26	27	29	28
Recording			Average tempo									
Martinez	First Reading	♩=	28	38	29	33	26	24	35	27	23	20
	Second Reading	♩=	29	40	30	32	27	24	35	27	22	21
	Third Reading	♩=	28	35	30	33	27	24	34	26	24	21
	Average all readings	♩=	28	38	30	33	27	24	35	27	23	21
	Measure			21	22	23	24	25	26	27	29	28
Recording			Average tempo									
Tilson Thomas	First Reading	♩=	31	37	33	33	30	30	34	32	31	22
	Second Reading	♩=	31	37	33	33	30	30	34	32	30	22
	Third Reading	♩=	31	36	34	33	30	30	34	33	29	21
	Average all readings	♩=	31	37	33	33	30	30	34	32	30	22
	Measure			21	22	23	24	25	26	27	29	28
Recording			Average tempo									
Vlla-Lobos	First Reading	♩=	35	40	40	40	37	38	37	29	29	23
	Second Reading	♩=	35	39	40	40	36	37	36	30	30	23
	Third Reading	♩=	34	38	41	39	38	37	36	31	26	24
	Average all readings	♩=	35	39	40	40	37	37	36	30	28	23

Prelude mm. 30-34

	Measure			30	31	32	33
Recording			Average tempo				
Gerling	First Reading	♩=	25	27	23	25	24
	Second Reading	♩=	24	26	24	24	24
	Third Reading	♩=	24	25	24	25	24
	Average all readings	♩=	25	26	24	25	24
	Measure			30	31	32	33
Recording			Average tempo				
Martinez	First Reading	♩=	25	27	26	22	26
	Second Reading	♩=	25	25	27	23	24
	Third Reading	♩=	25	25	27	21	26
	Average all readings	♩=	25	26	27	22	25
	Measure			30	31	32	33
Recording			Average tempo				
Tilson Thomas	First Reading	♩=	30	34	28	28	28
	Second Reading	♩=	30	34	29	27	29
	Third Reading	♩=	30	34	29	27	29
	Average all readings	♩=	30	34	29	27	29
	Measure			30	31	32	33
Recording			Average tempo				
Villa-Lobos	First Reading	♩=	27	32	26	26	25
	Second Reading	♩=	27	31	26	27	25
	Third Reading	♩=	27	31	27	23	28
	Average all readings	♩=	27	31	26	25	26

Prelude Final Measures Beat Chart

			Measure	34		35		36		37	
Recording			Average tempo								
Gerling	First Reading	♩=	22	29	20	26	20	22	22	15	18
	Second Reading	♩=	21	28	20	24	21	22	19	17	19
	Third Reading	♩=	22	29	20	24	21	22	21	16	20
	Average all readings	♩=	21	29	20	25	22	22	21	18	19
			Measure	34		35		36		37	
Recording			Average tempo								
Martinez	First Reading	♩=	20	24	23	19	15	19	13	19	15
	Second Reading	♩=	20	23	24	19	14	19	14	17	14
	Third Reading	♩=	20	25	23	19	15	19	14	18	14
	Average all readings	♩=	20	24	23	19	16	18	15	17	15
			Measure	34		35		36		37	
Recording			Average tempo								
Tilson Thomas	First Reading	♩=	24	29	24	26	19	25	20	18	16
	Second Reading	♩=	24	29	24	26	19	25	20	18	16
	Third Reading	♩=	24	28	24	26	19	26	19	19	15
	Average all readings	♩=	24	29	24	26	21	24	21	19	17
			Measure	34		35		36		37	
Recording			Average tempo								
Villa-Lobos	First Reading	♩=	28	30	30	27	26	29	19	15	11
	Second Reading	♩=	29	31	30	32	23	27	19	16	11
	Third Reading	♩=	28	31	33	28	22	29	19	16	12
	Average all readings	♩=	29	29	31	31	29	25	27	22	18

Chorale Beat Chart

			Measure	21		22		23		24		25		26		27		28		29	
Recording			Average tempo for the section																		
Gerling	First Reading	♩=	25	29	25	27	21	26	25	23	23	28	20	26	26	24	27	24	26	28	24
	Second Reading	♩=	25	23	25	26	22	25	26	23	24	26	20	26	27	24	27	23	29	25	25
	Third Reading	♩=	25	24	25	25	23	25	26	23	23	26	22	24	26	24	27	24	27	28	25
	Beat average for all readings	♩=		25	25	26	22	25	26	23	23	27	21	25	26	24	27	24	27	27	25
			Measure	21		22		23		24		25		26		27		28		29	
Recording			Average tempo for the section																		
Martinez	First Reading	♩=	29	40	36	30	27	34	33	28	24	36	18	33	39	29	26	20	27	23	18
	Second Reading	♩=	29	40	39	32	28	34	31	29	26	31	19	30	41	30	25	26	20	23	18
	Third Reading	♩=	29	37	33	31	30	33	32	29	26	31	20	31	38	29	24	24	25	25	18
	Beat average for all readings	♩=		39	36	31	28	34	32	29	25	33	19	31	39	29	25	23	24	24	18
			Measure	21		22		23		24		25		26		27		28		29	
Recording			Average tempo for the section																		
Tilson Thomas	First Reading	♩=	32	42	34	37	29	35	31	33	28	33	28	34	34	32	31	32	30	27	18
	Second Reading	♩=	32	44	32	36	31	37	30	35	27	33	28	34	34	32	32	31	29	26	18
	Third Reading	♩=	32	41	33	40	29	35	31	33	27	34	28	34	35	32	35	29	29	27	18
	Beat average for all readings	♩=		42	33	38	30	36	31	34	27	33	28	34	34	32	33	31	29	27	18
			Measure	21		22		23		24		25		26		27		28		29	
Recording			Average tempo for the section																		
Villa-Lobos	First Reading	♩=	35	43	38	39	41	41	38	39	35	41	35	41	35	29	29	29	29	27	20
	Second Reading	♩=	35	39	39	42	39	41	39	39	34	39	36	36	37	31	30	28	32	26	20
	Third Reading	♩=	35	38	39	41	40	38	40	40	35	38	36	36	36	33	30	26	27	29	21
	Beat average for all readings	♩=	35	40	39	41	40	40	39	39	35	39	36	38	36	31	30	28	29	27	20

Fugue Averaged Tempo Chart

		Exposition 1-28	Episode 1 29-44	Second theme 45-50	51- 55	Episode 2 56-68	Molto Allargando 69-70	Re-exp. 72-77	78-81	Grandioso 82-87	All Themes 88-92	93-94	Meno 95-97	Ending 98-99	Average Tempo
Gerling	𝅗𝅥=	96	94	84	62	94	65	97	93	84	93	86	82	39	**86**
Martinez	𝅗𝅥=	93	88	78	66	85	58	90	80	81	82	76	78	63	**80**
Tilson Thomas	𝅗𝅥=	99	99	91	55	92	66	97	96	88	87	87	74	36	**86**
Villa-Lobos	𝅗𝅥=	90	90	73	57	77	48	87	79	69	73	75	63	17	**73**

Fugue Average Tempo - measure by measure

Recording	m. 1				5					10					15					20					25				39					35				40				
Gerling	101	97	95	95	93	95	95	96	96	97	96	96	96	97	96	97	95	97	95	93	97	95	95	96	98	97	97	96	98	98	96	87	91	97	96	96	94	95	94	94	95	93	88	84
Martinez	98	94	94	93	93	93	95	93	91	92	92	93	94	92	92	94	93	93	91	91	91	91	90	93	93	93	92	91	94	91	93	91	92	92	93	92	92	90	76	83	76	74	69	70
Tilson Thomas	99	98	98	99	99	100	101	101	98	98	98	99	100	101	100	100	98	99	100	101	96	98	100	97	100	98	97	89	94	94	93	94	100	98	101	98	98	99	98	98	97	96	95	92
Villa-Lobos	97	96	94	93	92	91	92	91	93	93	91	91	90	91	91	91	90	92	91	90	87	88	88	85	85	87	86	82	81	81	79	77	82	78	80	79	78	80	78	78	75	81	67	70

Recording	m. 45					50					60					65				69 b1	b2	b3	b4	b5	70 b1	b2	b3	b4	b5			75				85				90
Gerling	83	86	87	86	85	79	90	87	86	91	99	99	99	96	93	93	96	96	86	72	46	35	34	33	79	102	87	90	62	101	97	98	97	96	94	83	85	84	84	86	80	93	92	93
Martinez	78	78	79	76	78	78	75	74	77	78	89	90	88	89	89	86	89	89	84	85	53	42	33	25	81	69	69	68	49	93	94	91	90	90	86	81	81	84	87	84	72	83	80	83
Tilson Thomas	95	91	94	92	90	87	91	88	90	89	92	94	95	95	94	91	98	96	88	88	62	38	34	25	94	98	91	82	31	101	98	98	95	97	96	88	89	90	92	88	81	89	88	87
Villa-Lobos	76	73	79	76	72	66	48	72	73	73	86	84	84	85	78	81	78	78	77	61	40	33	32	21	80	49	59	63	32	91	88	89	84	86	86	77	72	71	73	68	62	78	76	73

Recording	m. 91	92	88 a	89 a	90 a	91a	92a	93	94	95			98 b1	b2	b3	b4	b5	99
Gerling	92	92	93	93	93	93	91	94	79	83	80	72	40	30	25	28	18	50
Martinez	82	81	72	83	80	83	82	83	69	72	68	52	61	64	50	43	25	77
Tilson Thomas	90	87	85	87	87	87	87	81	68	64	59	58	55	44	28	32	14	51
Villa-Lobos	73	70	73	75	72	72	67	69	57	54	49	53	56	34	31	29	19	38

For charting purposes mm. 88-92 in Martinez's recording were tabulated twice. Tilson Thomas's added beats in m. 98 were omitted—only the second part of the measure was considered.

Fugue (Exposition) mm. 1-28 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		109	64	104	100	85	108	64	97	99	88	94	65
	Average bar tempo						99					98		
	Average Section	96												
	Second Reading													
	Tempo / Beat		114	68	96	100	88	102	66	98	93	96	97	63
	Average bar tempo						100					98		
	Average Section	96												
	Third Reading													
	Tempo / Beat		135	66	97	99	89	97	67	92	97	92	95	66
	Average bar tempo						104					96		
	Average Section	96												
	Average all readings	96					101					97		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		128	65	93	91	91	94	63	89	95	92	97	62
	Average bar tempo						100					93		
	Average Section	93												
	Second Reading													
	Tempo / Beat		113	66	91	95	85	106	61	94	95	90	95	65
	Average bar tempo						97					95		
	Average Section	93												
	Third Reading													
	Tempo / Beat		108	67	91	95	88	98	63	90	96	87	96	65
	Average bar tempo						96					93		
	Average Section	93												
	Average all readings	93					98					94		

Fugue (Exposition) mm. 1-28 - I

79	108	102	96	63	102	95	90	91	61	99	93	91	96	65	91	95	93	97
		96					96					93					94	
79	108	94	98	62	105	93	84	99	62	90	96	92	101	62	96	97	89	93
		94					95					94					95	
85	101	94	96	64	95	97	87	97	62	91	97	86	100	64	92	98	91	94
		95					94					93					95	
		95					95					93					95	
81	113	91	101	62	92	95	87	93	65	91	91	92	96	63	94	98	85	95
		95					94					93					94	
84	99	93	92	63	92	100	83	95	65	93	92	92	94	63	90	101	86	95
		94					92					94					93	
95	92	88	97	63	99	91	84	94	66	92	92	90	96	64	89	93	89	92
		94					93					93					93	
		94					93					93					93	

Fugue (Exposition) mm. 1-28 - I

65	79	108	95	102	66	94	92	91	97	66	96	93	94	100	64	99	93	99
			95					96					96					97
65	87	110	88	103	65	95	87	99	97	66	95	95	96	100	62	102	95	96
			95					96					96					97
65	90	98	91	104	65	94	89	92	97	67	91	98	98	100	64	95	95	97
			94					95					97					97
			95					96					96					97
68	80	104	96	98	62	92	91	88	92	65	91	93	82	94	63	90	94	88
			95					92					91					92
65	85	102	92	96	64	95	90	89	91	63	90	96	86	95	61	86	94	90
			94					93					92					91
68	92	94	96	95	63	95	86	92	88	63	88	94	89	90	64	92	90	91
			95					92					91					92
			95					93					91					92

Fugue (Exposition) mm. 1-28 - I

93	67	85	102	101	99	65	90	99	93	94	62	96	100	95	103	64	95	100
				96					96					96				
97	66	88	101	93	100	66	96	93	91	92	63	100	96	95	101	62	102	100
				96					96					96				
96	66	86	97	98	99	69	96	93	91	94	63	96	96	99	96	65	97	99
				95					96					96				
				96					96					96				
91	62	84	99	95	94	65	95	86	90	93	64	97	92	92	96	62	92	94
				92					92					94				
92	60	93	92	90	103	62	97	88	94	94	64	90	95	92	96	62	92	93
				91					95					93				
92	61	86	98	94	93	63	92	91	91	95	67	88	95	93	92	64	93	93
				92					92					94				
				92					93					94				

Fugue (Exposition) mm. 1-28 - I

89	98	63	94	99	97	98	63	100	96	92	94	63	96	98	93	100	64	96
97					96					96					95			
93	92	64	84	109	99	100	64	93	93	103	91	63	100	96	93	100	62	102
98					96					97					95			
91	95	65	89	99	96	99	65	100	92	96	96	63	98	94	95	102	64	96
96					95					97					96			
97					96					97					95			
88	89	63	81	100	95	100	62	96	87	89	92	63	100	90	90	94	62	93
93					92					93					93			
88	91	62	80	103	91	105	62	93	93	88	90	65	91	92	92	96	61	93
92					92					94					92			
85	92	60	98	91	90	99	63	91	93	92	89	64	86	99	94	87	63	91
92					92					94					93			
92					92					94					93			

Fugue (Exposition) mm. 1-28 - I

103	91	94	62	85	100	101	97	64	91	90	88	95	65	94	99	99	97	62
	97					95					92					97		
97	90	95	64	86	103	92	98	62	100	91	81	100	64	97	100	96	97	65
	96					94					93					98		
97	91	98	65	84	99	97	99	64	94	88	88	95	66	97	99	91	100	63
	96					95					93					96		
	97					95					93					97		
93	93	87	63	84	96	92	95	63	91	87	88	91	63	87	97	88	91	64
	93					91					91					92		
97	90	95	62	83	100	89	94	64	94	85	85	89	67	90	91	92	89	63
	94					92					91					92		
93	92	93	63	87	96	88	96	61	92	92	89	82	68	85	94	89	91	65
	92					92					92					90		
	93					91					91					91		

Fugue (Exposition) mm. 1-28 - I

97	93	92	97	67	85	103	93	103	65	102	90	91	95	63	99	104	99	96
		94					96					97					98	
93	91	96	92	69	86	106	89	103	65	100	88	92	100	67	94	96	99	100
		95					95					96					98	
91	97	96	96	66	95	91	92	100	65	100	89	93	98	65	98	97	96	98
		96					95					96					97	
		95					95					96					98	
91	86	90	87	63	85	97	91	97	61	100	86	84	95	65	90	96	86	97
		91					91					92					93	
87	91	89	89	63	92	85	92	97	63	96	87	88	92	65	90	94	87	96
		90					90					92					92	
86	91	91	85	63	85	93	92	102	62	96	83	93	91	64	93	93	90	92
		91					90					93					93	
		91					90					93					93	

Fugue (Exposition) mm. 1-28 - I

62	103	100	93	98	67	85	103	94	98	66	97	96	89
			97					96					96
64	96	106	89	100	67	82	108	93	101	66	97	96	84
			97					97					95
66	97	99	92	96	67	85	108	96	100	63	100	99	86
			97					97					96
			97					97					96
65	97	94	85	96	64	83	90	92	96	62	100	86	85
			94					91					92
67	92	96	86	91	64	89	92	87	92	65	97	87	81
			94					91					91
66	92	94	79	97	66	89	90	92	90	66	93	83	84
			91					93					90
			93					92					91

Fugue (Exposition) mm. 1-28 II

Recording															
Tilson Thomas															
	First Reading														
	Tempo / Beat		85	73	85	98	99	101	66	91	100	96	98	65	91
	Average bar						95					97			
	Average	99													
	Second														
	Tempo / Beat		109	70	93	100	94	103	64	96	101	94	99	64	92
	Average bar						100					98			
	Average	99													
	Third Reading														
	Tempo / Beat		112	67	98	97	94	98	68	89	96	102	101	65	97
	Average bar						100					97			
	Average	99													
	Average all	99					99					98			
Recording															
Villa-Lobos															
	First Reading														
	Tempo / Beat		107	67	86	101	88	99	66	96	103	83	104	66	100
	Average bar						96					96			
	Average	90													
	Second														
	Tempo / Beat		104	67	87	98	92	98	66	92	98	93	98	65	82
	Average bar						96					96			
	Average	90													
	Third Reading														
	Tempo / Beat		113	65	86	99	92	97	66	93	100	89	92	69	84
	Average bar						98					96			
	Average	90													
	Average all	90					97					96			

Fugue (Exposition) mm. 1-28 II

103	97	105	70	98	97	90	101	68	94	103	100	103	68	97	102	97	103	70
	97					99					100					100		
106	94	103	68	100	97	93	97	69	97	99	102	101	70	93	101	100	103	68
	97					99					100					100		
98	102	100	66	96	102	97	100	68	91	102	97	108	68	92	102	98	104	71
	99					99					98					100		
	98					99					99					100		
90	85	103	63	93	92	80	91	64	90	96	87	97	61	88	97	83	97	62
	96					92					92					91		
101	91	100	63	98	90	87	90	62	90	100	86	92	63	87	95	86	97	61
	94					94					92					91		
97	91	101	65	94	90	85	90	62	92	96	90	92	61	87	99	89	93	62
	94					94					92					92		
	94					93					92					91		

Fugue (Exposition) mm. 1-28 II

87	108	104	104	67	108	96	98	95	66	95	100	99	101	65	92	100	103	102
		101					101					98					99	
87	109	100	102	72	97	100	94	105	65	97	92	103	97	67	97	97	100	99
		100					100					99					98	
93	103	94	109	68	96	105	93	100	68	92	89	108	98	67	91	100	101	100
		100					101					98					98	
		101					101					98					98	
83	93	98	92	60	94	90	86	96	62	90	97	89	97	63	90	95	87	100
		93					90					93					93	
89	88	93	94	60	94	87	90	98	61	87	96	90	98	62	91	94	88	96
		92					91					92					93	
81	100	93	91	60	96	91	87	96	60	84	103	90	97	64	90	95	90	92
		92					91					93					94	
		92					91					93					93	

Fugue (Exposition) mm. 1-28 II

65	90	104	96	103	67	100	101	92	97	68	97	100	103	103	69	99	103	95
			98					99					100					101
66	89	94	108	104	68	97	100	94	99	70	93	103	97	105	71	94	103	96
			98					99					99					101
67	88	102	100	100	69	96	102	92	97	70	95	103	97	106	70	93	99	104
			98					99					99					101
			98					99					100					101
62	79	96	91	96	61	84	96	88	91	57	93	90	95	93	61	88	93	90
			92					91					91					91
64	85	85	91	97	62	83	92	91	90	59	86	94	91	89	63	89	90	92
			91					91					90					91
65	80	90	92	97	62	82	96	91	88	59	90	91	92	92	63	84	92	96
			90					92					90					92
			91					91					90					91

Fugue (Exposition) mm. 1-28 II

103	65	89	109	101	99	67	100	105	96	97	67	96	100	96	104	67	94	104
				100					100					98				
106	65	88	107	101	99	67	101	106	93	96	67	95	105	95	102	66	96	105
				100					100					98				
94	68	89	109	102	98	69	100	102	92	98	68	92	100	103	102	67	91	103
				99					99					99				
				100					100					98				
97	58	80	100	89	96	59	92	90	90	91	61	92	92	87	95	59	90	98
				91					91					91				
95	61	79	98	90	93	60	86	92	92	91	62	88	92	86	94	60	87	97
				91					91					90				
91	60	80	101	93	89	59	93	89	92	93	60	87	92	86	92	62	85	100
				91					90					90				
				91					91					90				

Fugue (Exposition) mm. 1-28 II

95	100	66	84	109	103	105	68	98	106	96	96	67	93	98	94	101	67	94
100					99					101					96			
94	100	66	85	111	106	100	67	102	103	96	95	67	94	97	94	99	67	99
99					100					100					96			
99	97	70	82	113	106	95	70	101	104	96	91	68	93	97	93	98	70	93
99					101					100					95			
99					100					101					96			
86	96	61	84	93	91	96	60	94	81	88	88	59	83	93	85	91	58	83
92					91					90					88			
90	95	61	78	96	97	88	61	93	83	92	83	59	82	90	87	87	61	84
92					92					90					86			
87	96	60	88	90	94	90	62	92	83	91	84	59	83	89	88	88	59	84
91					92					90					86			
92					91					90					87			

Fugue (Exposition) mm. 1-28 II

103	92	102	70	87	109	99	102	66	98	94	90	96	70	92	99	103	102	67
	98					100					97					99		
104	92	99	68	86	113	102	100	66	100	98	90	96	99	74	83	107	98	67
	99					100					97					102		
100	94	98	68	93	110	98	105	64	102	92	94	95	70	91	102	104	102	66
	98					100					98					99		
	98					100					97					100		
95	81	95	59	76	94	86	92	55	88	85	79	85	58	80	86	84	91	58
	87					88					85					84		
89	85	91	61	76	94	87	85	58	86	82	82	85	59	78	91	81	89	60
	87					88					84					85		
91	88	88	63	71	96	89	88	57	87	82	82	90	58	82	88	80	88	59
	88					88					85					85		
	88					88					85					85		

Fugue (Exposition) mm. 1-28 II

94	96	103	92	67	90	98	100	100	66	100	91	62
		99					96					90
90	99	103	95	63	90	106	100	98	66	97	88	63
		98					97					89
95	96	96	97	67	92	105	96	94	67	86	88	65
		98					98					87
		98					97					89
87	90	82	92	55	75	89	91	91	53	80	80	80
		87					86					82
86	88	81	88	57	78	88	91	88	53	82	79	79
		87					86					82
84	91	80	88	57	78	87	95	87	54	81	82	78
		86					87					82
		87					86					82

Fugue (Episode I) m.29-44 - I

Recording											
Gerling											
	First Reading										
	Tempo / Beat		101	69	97	98	93	103	66	95	100
	Average bar tempo						98				
	Average Section tempo	94									
	Second Reading										
	Tempo / Beat		95	69	98	100	94	102	65	96	102
	Average bar tempo						98				
	Average Section tempo	94									
	Third Reading										
	Tempo / Beat		101	71	91	102	93	100	66	96	96
	Average bar tempo						99				
	Average Section tempo	93									
	Average all Readings	94									
Recording											
Martinez											
	First Reading										
	Tempo / Beat		95	70	93	86	90	92	65	84	93
	Average bar tempo						94				
	Average Section tempo	88									
	Second Reading										
	Tempo / Beat		105	64	92	87	91	92	63	89	93
	Average bar tempo						94				
	Average Section tempo	88									
	Third Reading										
	Tempo / Beat		96	65	89	91	91	93	64	85	91
	Average bar tempo						93				
	Average Section tempo	88									
	Average all Readings	88									

Fugue (Episode I) m.29-44 - I

96	94	67	94	94	94	100	60	88	92	65	78	66	96	93	90	99	65	100
99					95					87					91			
93	102	69	91	96	95	93	60	89	89	71	76	62	91	96	98	96	65	92
98					98					86					91			
96	104	65	93	93	96	99	62	87	88	70	75	65	92	92	93	99	63	100
97					97					87					90			
86	89	62	87	99	96	93	58	94	98	75	99	64	90	92	91	91	65	85
90					93					89					94			
85	96	63	83	89	100	93	62	93	92	92	76	66	93	83	91	98	63	87
91					92					93					88			
90	96	62	89	88	97	91	61	91	86	89	95	61	92	92	94	91	60	97
91					93					90					93			

Fugue (Episode I) m.29-44 - I

89	99	94	66	99	102	90	93	63	99	99	94	92	65	92	97	91	94	64
	97					97					96					94		
99	99	100	62	95	102	92	93	61	101	97	97	96	62	95	97	93	95	65
	97					96					96					95		
96	100	97	65	95	93	96	96	64	93	97	96	94	65	91	99	92	92	66
	98					96					96					95		
92	94	92	64	87	94	93	89	65	89	87	98	91	62	92	88	97	91	60
	92					92					92					92		
93	90	93	64	86	101	92	97	61	88	93	94	90	61	87	93	97	90	61
	92					94					93					92		
95	91	88	65	92	96	92	93	63	87	87	90	93	62	93	94	91	93	58
	93					93					90					93		

Fugue (Episode I) m.29-44 - I

92	98	99	90	65	91	99	89	96	66	86	97	93	97	65	92	96	94	94
		96					93					94					95	
90	96	93	93	68	94	96	87	100	63	85	92	91	94	68	92	92	97	96
		94					94					92					95	
91	97	102	94	63	97	96	84	102	64	91	98	86	97	67	91	87	102	88
		96					93					95					96	
82	95	94	85	46	71	77	70	72	55	79	84	82	77	45	70	83	87	71
		90					74					80					77	
82	93	93	89	45	74	83	74	78	39	88	94	99	76	47	75	83	78	77
		90					78					84					76	
82	92	94	81	47	84	81	63	81	49	97	98	82	64	41	78	91	80	64
		90					76					86					75	

Fugue (Episode I) m.29-44 - I

66	91	100	92	89	62	87	89	85	97	62	89	86	64
			95					88					86
63	93	97	88	98	62	94	90	85	100	59	83	77	73
			94					87					84
64	91	93	87	100	62	95	100	85	94	62	84	77	63
			91					88					82
46	72	76	80	76	48	71	69	58	66	66	59	64	68
			74					66					71
45	73	77	76	78	46	71	69	64	73	52	69	77	63
			74					71					72
46	79	77	78	77	47	62	81	66	69	52	66	75	45
			73					71					67

Fugue Episode I (m.29-44) - II

Recording											
Tilson Thomas											
	First Reading										
	Tempo / Beat		91	62	93	96	91	93	61	91	103
	Average bar tempo						93				
	Average Section tempo	97									
	Second Reading										
	Tempo / Beat		87	65	88	98	97	94	61	91	99
	Average bar tempo						94				
	Average Section tempo	97									
	Third Reading										
	Tempo / Beat		95	65	91	101	88	99	62	92	93
	Average bar tempo						94				
	Average Section tempo	97									
	Average all readings	97					94				
Recording											
Villa-Lobos											
	First Reading										
	Tempo / Beat		87	54	80	78	79	85	54	76	81
	Average bar tempo						81				
	Average Section tempo	79									
	Second Reading										
	Tempo / Beat		89	57	74	81	79	87	53	76	78
	Average bar tempo						82				
	Average Section tempo	79									
	Third Reading										
	Tempo / Beat		87	54	79	79	76	88	53	77	80
	Average bar tempo						80				
	Average Section tempo	79									
	Average all readings	79					81				

Fugue Episode I (m.29-44) - II

91	93	64	88	94	96	99	56	92	91	106	103	68	100	105	97	96	66	97
94					93					94					101			
93	90	65	91	94	96	94	59	90	97	100	104	64	100	102	95	100	67	93
94					94					94					99			
92	91	64	92	93	94	96	58	88	98	105	100	65	99	103	96	100	67	93
94					93					95					99			
94					93					94					100			
78	80	56	79	78	78	82	54	75	77	68	92	59	80	75	76	78	53	73
80					80					77					82			
87	77	55	73	84	81	80	54	74	75	73	87	55	77	81	77	77	53	74
82					80					77					81			
80	77	57	72	80	78	86	53	77	75	72	89	55	78	80	78	77	53	71
81					78					78					82			
81					79					77					82			

Fugue Episode I (m.29-44) - II

98	97	99	66	100	109	102	91	68	93	97	100	103	67	97	94	100	92	73
	97					102					97					99		
99	100	97	69	99	104	99	93	69	97	96	101	100	68	94	99	96	93	69
	98					100					98					98		
100	99	96	67	105	100	102	95	68	96	101	96	98	70	94	98	97	96	72
	98					101					98					98		
	98					101					98					98		
80	80	84	56	66	81	86	86	56	69	75	78	80	52	76	77	78	78	56
	78					80					78					78		
79	84	80	54	70	82	85	83	55	73	75	85	77	48	81	80	79	74	57
	79					80					80					78		
83	83	77	55	72	78	85	84	54	74	80	78	76	50	78	79	77	79	54
	79					79					79					77		
	78					80					79					78		

Fugue Episode I (m.29-44) - II

97	100	100	93	65	99	96	98	99	68	91	103	99	96	72	94	94	99	87
		100					97					99					98	
96	103	102	96	66	92	100	103	100	67	89	96	101	96	71	96	92	91	92
		100					98					97					96	
91	100	100	96	66	94	100	102	105	64	94	100	99	99	67	96	94	93	95
		99					98					99					96	
		99					98					98					97	
74	80	82	82	54	73	78	78	80	55	73	80	76	77	42	80	75	77	80
		80					78					78					74	
76	81	84	77	54	77	79	72	82	56	70	78	78	83	43	73	79	77	80
		80					77					78					75	
79	81	82	78	53	82	77	72	85	54	72	81	70	84	43	66	79	80	78
		80					78					78					75	
		80					78					78					75	

Fugue Episode I (m.29-44) - II

64	92	102	99	95	65	92	90	103	98	64	87	87	82
			95					94					90
68	93	94	106	94	63	90	99	107	99	73	88	89	74
			97					94					92
66	93	99	95	99	66	94	90	101	98	71	93	85	83
			96					95					93
			96					95					92
51	75	80	95	87	45	56	76	68	89	54	44	60	81
			81					65					71
54	72	79	79	80	47	72	63	60	78	50	72	54	66
			78					67					69
53	74	85	96	86	44	56	80	64	71	44	60	62	85
			82					68					69
			81					67					70

Fugue (Second Theme) mm. 45-50 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		74	62	87	78	81	85	56	87	82	88	93	55
	Average bar tempo						83					85		
	Average Section tempo	84												
	Second Reading													
	Tempo / Beat		56	65	78	72	99	93	55	87	90	81	88	56
	Average bar tempo						80					87		
	Average Section tempo	83												
	Third Reading													
	Tempo / Beat		87	58	92	83	79	88	53	90	86	82	97	52
	Average bar tempo						86					85		
	Average Section tempo	84												
	Average all readings	84					83					86		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		78	47	85	76	86	80	48	75	79	82	77	53
	Average bar tempo						79					78		
	Average Section tempo	78												
	Second Reading													
	Tempo / Beat		77	47	81	83	78	79	50	77	77	81	73	53
	Average bar tempo						78					78		
	Average Section tempo	78												
	Third Reading													
	Tempo / Beat		77	47	81	83	78	79	50	77	77	81	73	53
	Average bar tempo						78					78		
	Average Section tempo	78												
	Average all readings	78					78					78		

Fugue (Second Theme) mm. 45-50 - I

82	81	97	99	52	94	89	77	97	54	86	83	80	78	57	83	88	67
		87					87					85					80
88	85	82	97	53	86	85	82	89	59	86	77	81	79	60	74	84	65
		85					86					84					78
83	96	91	90	54	87	87	84	91	53	88	84	81	82	53	84	93	58
		89					86					85					79
		87					86					85					79
81	79	82	73	47	79	76	80	81	52	75	77	80	91	50	68	81	75
		80					76					78					78
79	77	84	77	51	74	78	79	80	59	72	69	77	77	50	77	81	82
		78					77					77					78
79	77	84	77	51	74	78	79	80	59	72	69	77	77	50	77	81	82
		78					77					77					78
		79					76					78					78

Fugue (Second Theme) mm. 45-50 - II

Recording													
Tilson													
	First Reading												
	Tempo / Beat		107	64	80	99	96	97	62	96	92	76	106
	Average bar tempo						96					91	
	Average Section tempo	91											
	Second Reading												
	Tempo / Beat		101	64	87	97	86	99	58	93	97	84	99
	Average bar tempo						93					92	
	Average Section tempo	91											
	Third Reading												
	Tempo / Beat		102	63	95	97	85	94	58	94	91	85	99
	Average bar tempo						95					90	
	Average Section tempo	91											
	Average all readings	91					95					91	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		83	45	70	86	66	84	43	62	94	69	88
	Average bar tempo						74					75	
	Average Section tempo	73											
	Second Reading												
	Tempo / Beat		79	45	79	86	65	79	41	74	82	67	88
	Average bar tempo						75					73	
	Average Section tempo	73											
	Third Reading												
	Tempo / Beat		91	42	74	78	79	73	40	81	69	79	82
	Average bar tempo						77					72	
	Average Section tempo	73											
	Average all readings	73					76					73	

Fugue (Second Theme) mm. 45-50 - II

60	94	100	82	92	63	92	97	86	85	65	91	85	78	94	66	86	94	72
			94					92					87					89
62	93	86	93	100	60	94	82	84	99	66	93	90	87	93	60	89	90	68
			93					90					94					86
62	94	94	88	102	63	94	90	84	99	62	95	83	81	93	65	84	89	73
			94					93					90					87
			94					92					90					87
47	76	87	72	79	42	75	83	76	79	42	69	80	74	62	38	63	85	67
			79					75					73					67
49	77	82	72	80	43	73	90	72	75	42	75	80	67	72	37	63	79	65
			78					76					72					67
48	79	71	91	75	42	81	87	75	78	41	74	74	73	60	44	66	78	59
			79					76					72					66
			79					76					72					66

Fugue mm. 51-55 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		69	48	75	80	74	82	44	67	71	81	68	47
	Average bar tempo						74					73		
	Average Section tempo	62												
	Second Reading													
	Tempo / Beat		85	40	78	81	82	83	49	63	81	79	81	34
	Average bar tempo						77					76		
	Average Section tempo	62												
	Third Reading													
	Tempo / Beat		65	51	70	84	77	82	47	73	80	59	79	45
	Average bar tempo						74					73		
	Average Section tempo	62												
	Average all readings	62					75					74		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		66	49	62	74	62	67	46	78	66	44	78	62
	Average bar tempo						68					65		
	Average Section tempo	65												
	Second Reading													
	Tempo / Beat		75	47	69	71	63	70	43	70	75	43	70	64
	Average bar tempo						70					64		
	Average Section tempo	66												
	Third Reading													
	Tempo / Beat		69	51	65	77	66	80	40	74	77	81	81	33
	Average bar tempo						71					74		
	Average Section tempo	67												
	Average all readings	66					69					68		

Fugue mm. 51-55 - I

57	68	58	47	41	34	27
		64		66		46
65	68	52	46	41	26	33
		63		65		44
63	62	53	47	38	28	35
		65		64		47
		64		65		46
66	72	63	45	45	39	32
		74		68		53
58	66	74	53	44	36	38
		73		73		56
58	63	88	49	47	35	35
		68		72		52
		72		71		54

Fugue mm. 51-55 - II

Recording													
Tilson-Thomas													
	First Reading												
	Tempo / Beat		82	30	83	81	82	81	48	81	77	86	91
	Average bar tempo						75					79	
	Average Section tempo	57											
	Second Reading												
	Tempo / Beat		77	35	69	79	85	91	42	73	85	63	72
	Average bar tempo						72					75	
	Average Section tempo	55											
	Third Reading												
	Tempo / Beat		82	37	58	73	79	81	45	68	78	72	66
	Average bar tempo						70					73	
	Average Section tempo	54											
	Average all readings	55					72					76	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		73	44	78	97	66	98	31	85	77	52	85
	Average bar tempo						76					72	
	Average Section tempo	58											
	Second Reading												
	Tempo / Beat		78	40	97	86	82	89	28	77	66	83	57
	Average bar tempo						81					71	
	Average Section tempo	56											
	Third Reading												
	Tempo / Beat		66	54	71	85	80	94	30	77	81	59	67
	Average bar tempo						77					71	
	Average Section tempo	57											
	Average all readings	57					78					71	

Fugue mm. 51-55 - II

26	71	74	47	40	26	26	20
			64		50		34
35	81	57	52	38	27	26	16
			63		49		32
45	56	53	56	41	29	25	16
			60		52		31
			62		50		32
48	66	66	59	43	26	26	25
			70		52		38
53	62	60	68	37	29	27	25
			65		50		39
46	64	63	65	41	27	28	24
			66		51		39
			67		51		39

Fugue (Episode II) mm. 56-68 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		102	60	104	92	77	84	65	76	95	82	84	51
	Average bar tempo						93					87		
	Average Section tempo	95												
	Second Reading													
	Tempo / Beat		86	60	89	84	83	85	57	86	90	89	86	62
	Average bar tempo						86					87		
	Average Section tempo	93												
	Third Reading													
	Tempo / Beat		99	55	104	83	82	77	56	93	89	94	99	54
	Average bar tempo						90					87		
	Average Section tempo	94												
	Average all readings	94					90					87		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		88	52	86	75	62	65	53	73	78	70	81	56
	Average bar tempo						78					73		
	Average Section tempo	86												
	Second Reading													
	Tempo / Beat													
	Average bar tempo		88	54	70	72	71	68	52	74	78	75	77	54
	Average Section tempo	84												
	Third Reading													
	Tempo / Beat		81	57	73	69	67	71	50	78	77	75	77	53
	Average bar tempo						75					75		
	Average Section tempo	86												
	Average all readings	85					75					74		

Fugue (Episode II) mm. 56-68 - I

91	76	90	86	84	58	88	81	64	97	90	94	100	66	102	92	96	101	63
		84					88					99					102	
82	94	79	98	63	85	94	94	113	69	97	91	94	104	64	91	100	97	103
		87					93					100					98	
86	104	75	88	64	91	96	89	111	67	97	95	91	101	68	94	87	103	100
		89					92					99					97	
		86					91					99					99	
75	82	76	77	56	75	89	78	77	61	87	87	93	91	63	86	86	91	91
		80					81					87					90	
79	78	74	73	58	77	82	73	83	64	88	88	94	89	62	91	85	89	98
81	82	73	83	56	76	86	80	74	58	84	88	96	89	61	87	85	97	91
		78					82					86					90	
		77					78					89					90	

Fugue (Episode II) mm. 56-68 - I

89	104	100	97	72	90	98	85	92	66	87	91	96	99	65	92	91	86	88
			100					96					96					94
65	91	97	100	102	68	89	94	92	90	66	89	88	94	102	65	86	89	90
			98					96					92					93
70	94	92	101	99	66	96	102	88	86	64	94	83	93	107	64	92	82	91
			98					97					90					94
			99					96					93					93
62	86	83	95	95	58	83	96	88	85	65	89	88	90	94	62	85	80	89
			90					90					90					88
61	92	88	86	92	59	84	92	87	88	63	89	87	87	92	63	91	90	84
63	87	85	91	96	60	85	98	82	90	62	93	89	86	92	62	86	85	76
			90					90					90					86
			88					89					89					86

Fugue (Episode II) mm. 56-68 - I

63	94	94	100	99	64	91	98	92	94	60	91	77	82	72
				99					97					86
87	67	92	101	90	100	65	91	100	89	95	65	88	73	77
				94					96					86
85	66	95	95	100	95	64	94	100	96	90	57	94	77	82
				95					96					86
				96					96					86
83	62	91	92	89	89	62	92	85	87	86	62	85	76	95
				90					89					87
77	60	91	93	86	95	62	85	92	88	88	55	94	86	78
93	62	87	90	94	92	61	86	93	87	90	58	86	78	87
				91					90					86
				89					89					84

Fugue (Episode II) m. 56-68 - II

Recording													
Tilson Thomas													
	First Reading												
	Tempo / Beat		94	57	98	85	82	90	58	84	100	79	90
	Average bar tempo						89					88	
	Average Section tempo	93											
	Second Reading												
	Tempo / Beat		102	57	80	109	92	94	62	84	86	81	91
	Average bar tempo						94					88	
	Average Section tempo	93											
	Third Reading												
	Tempo / Beat		94	64	96	87	81	91	62	84	93	84	88
	Average bar tempo						91					89	
	Average Section tempo	92											
	Average all readings	93					91					88	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		73	51	75	69	64	75	48	71	68	66	64
	Average bar tempo						72					70	
	Average Section tempo	77											
	Second Reading												
	Tempo / Beat		76	54	66	78	60	71	51	65	69	62	73
	Average bar tempo						72					69	
	Average Section tempo	77											
	Third Reading												
	Tempo / Beat		77	54	65	72	60	74	51	72	65	67	69
	Average bar tempo						71					71	
	Average Section tempo	77											
	Average all readings	77					72					70	

Fugue (Episode II) m. 56-68 - II

63	90	103	79	87	59	89	100	77	102	64	92	90	93	90	67	94	89	97
			91					88					95					94
62	89	93	78	87	64	84	99	87	90	62	89	92	91	99	62	93	92	96
			89					91					91					95
58	89	100	83	86	62	87	98	81	92	65	87	92	90	97	64	92	89	91
			89					89					92					93
			90					89					92					94
50	69	84	66	79	48	74	79	65	92	52	78	84	79	86	53	78	83	80
			72					74					82					81
53	67	84	68	76	49	72	80	65	85	53	84	79	81	85	54	79	82	78
			74					73					82					81
49	70	82	70	74	50	72	74	70	86	52	78	83	81	86	55	75	82	79
			73					73					81					81
			73					73					82					81

Fugue (Episode II) m. 56-68 - II

96	63	104	91	90	94	63	93	101	86	93	66	92	95	96	100	62	87	88
				95					94					95				
97	62	97	90	97	100	64	91	100	88	91	64	98	97	90	96	63	94	93
				95					95					94				
100	64	99	87	96	98	65	92	96	92	92	67	91	90	97	96	57	95	96
				96					95					94				
				95					95					94				
80	59	81	80	83	86	54	84	88	79	77	51	76	71	54	86	82	69	69
				82					84					71				
84	58	83	78	84	84	56	83	87	79	74	51	75	76	76	79	58	68	76
				83					83					76				
84	58	81	79	83	85	55	84	85	81	75	52	76	73	79	84	53	71	71
				83					84					76				
				83					84					74				

Fugue (Episode II) m. 56-68 - II

79	117	68	96	97	93	99	66	93	101	87	85	62	83	90	82
89					101					96					87
92	88	67	93	93	95	101	66	93	99	93	91	53	102	85	87
94					94					97					89
80	110	71	90	93	97	93	68	96	96	92	85	61	92	87	88
90					99					96					89
91					98					96					88
71	70	49	73	82	71	71	49	73	79	69	74	55	70	79	81
84					74					73					77
71	68	49	69	81	76	69	50	75	76	66	74	54	77	67	76
76					74					72					75
73	70	49	71	78	74	71	51	74	74	71	68	54	76	77	79
76					73					73					76
78					74					73					76

Fugue (Molto Allargando- a Tempo) mm. 69-71 - I

Recording			m.69						m.70					m.71
Gerling			B. 1	B. 2	B. 3	B. 4	B. 5		B. 1	B. 2	B. 3	B. 4	B. 5	
	First Reading													
	Tempo / Beat		73	31	36	33	33		79	69	85	92	65	73
	Compensated 2nd			46						104				
	Average bar tempo	44						86						
	Second Reading													
	Tempo / Beat		75	30	35	35	33		77	67	92	88	60	69
	Compensated 2nd			45						100				
	Average bar tempo	45						85						
	Third Reading													
	Tempo / Beat		69	31	34	35	33		82	67	85	91	61	64
	Compensated 2nd			46						100				
	Average bar tempo	44						84						
	Avg. beats 1&2 m70								90					
	Average for Reeading	44	72	46	35	34	33	85	79	102	87	90	62	69
	Average for section	65												
Recording			m.69						m.70					m.71
Martinez			B. 1	B. 2	B. 3	B. 4	B. 5		B. 1	B. 2	B. 3	B. 4	B. 5	
	First Reading													
	Tempo / Beat		82	35	42	33	26		80	47	66	68	51	53
	Compensated second			52						70				
	Average bar tempo	47						68						
	Second Reading													
	Tempo / Beat		83	35	43	33	25		85	44	73	67	49	54
	Compensated second			52						66				
	Average bar tempo	47						69						
	Third Reading													
	Tempo / Beat		89	36	42	34	25		79	47	68	69	47	53
	Compensated second			54						70				
	Average bar tempo	49						68						
	Avg. beats 1&2 m70								75					
	Average for Reeading	48	85	53	42	33	25	68	81	69	69	68	49	53
	Average for section	58												

Fugue (Molto Allargando- a Tempo) mm. 69-71 -II

Recording			m.69						m.70					m.71
Tilson Thomas			B. 1	B. 2	B. 3	B. 4	B. 5		B. 1	B. 2	B. 3	B. 4	B. 5	
	First Reading													
	Tempo / Beat		90	39	38	35	24		93	65	90	83	30	48
	Compensated 2nd			58						98				
	Average bar tempo	49						82						
	Second Reading													
	Tempo / Beat		93	43	40	33	25		96	64	91	81	31	50
	Compensated 2nd			64						96				
	Average bar tempo	51						83						
	Third Reading													
	Tempo / Beat		81	43	37	33	25		93	68	91	82	31	49
	Compensated 2nd			64						102				
	Average bar tempo	48						83						
	Avg. beats 1&2 m70								96					
	Average for Reeading	49	88	62	38	34	25	83	94	98	91	82	31	49
	Average for section	66												
Recording			m.69						m.70					m.71
Villa-Lobos			B. 1	B. 2	B. 3	B. 4	B. 5		B. 1	B. 2	B. 3	B. 4	B. 5	
	First Reading													
	Tempo / Beat		58	28	33	31	21		78	33	56	65	32	39
	Compensated 2nd			42						50				
	Average bar tempo	37						58						
	Second Reading													
	Tempo / Beat		63	26	34	32	22		83	32	62	63	31	39
	Compensated 2nd			39						48				
	Average bar tempo	38						59						
	Third Reading													
	Tempo / Beat		63	27	33	32	21		78	33	58	62	32	38
	Compensated 2nd			40						50				
	Average bar tempo	38						57						
	Avg. beats 1&2 m70								64					
	Average for Reeading	38	61	40	33	32	21	58	80	49	59	63	32	39
	Average for section	48												

Fugue (Condensed Entries) mm. 72-77 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		122	61	102	102	92	101	65	81	106	100	98	62
	Average bar tempo						102					97		
	Average Section tempo	96												
	Second Reading													
	Tempo / Beat		120	65	93	107	91	96	64	104	88	96	100	63
	Average bar tempo						102					96		
	Average Section tempo	97												
	Third Reading													
	Tempo / Beat		113	65	96	99	96	100	65	105	96	89	100	66
	Average bar tempo						100					98		
	Average Section tempo	97												
	Average all readings	97					101					97		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		111	59	91	92	91	92	61	90	97	94	97	58
	Average bar tempo						95					93		
	Average Section tempo	90												
	Second Reading													
	Tempo / Beat		107	60	89	92	86	93	64	88	96	98	89	62
	Average bar tempo						93					94		
	Average Section tempo	90												
	Third Reading													
	Tempo / Beat		105	60	91	91	85	98	62	99	91	90	96	59
	Average bar tempo						92					94		
	Average Section tempo	90												
	Average all readings	90					93					94		

Fugue (Condensed Entries) mm. 72-77 - I

97	106	97	92	64	100	99	95	98	64	98	95	97	101	63	102	86	70
		98					96					97					91
97	103	93	99	67	95	94	102	89	66	100	96	96	104	65	89	92	97
		98					98					96					96
94	102	93	97	66	88	102	103	96	67	85	101	101	103	65	97	88	92
		98					98					97					96
		98					97					96					94
97	94	86	90	60	91	93	87	92	58	89	92	89	93	56	92	80	82
		92					90					90					86
91	91	88	89	63	91	91	84	95	59	86	93	87	91	58	90	83	84
		90					90					90					87
90	93	91	94	60	92	89	88	91	60	83	93	89	90	60	81	87	83
		92					91					89					86
		91					90					90					86

Fugue (Condensed Entries) mm. 72-77 - II

Recording													
Tilson													
	First Reading												
	Tempo / Beat		113	72	97	100	90	108	62	96	97	96	100
	Average bar tempo						102					98	
	Average Section tempo	97											
	Second Reading												
	Tempo / Beat		121	65	95	100	88	102	66	86	106	96	100
	Average bar tempo						100					98	
	Average Section tempo	97											
	Third Reading												
	Tempo / Beat		118	66	95	98	91	105	66	86	106	93	102
	Average bar tempo						100					98	
	Average Section tempo	97											
	Average all readings	97					101					98	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		100	56	90	91	91	92	59	72	101	86	93
	Average bar tempo						91					88	
	Average Section tempo	87											
	Second Reading												
	Tempo / Beat		105	56	84	89	90	86	62	70	103	87	92
	Average bar tempo						90					88	
	Average Section tempo	87											
	Third Reading												
	Tempo / Beat		106	58	84	90	85	93	60	76	95	87	92
	Average bar tempo						90					88	
	Average Section tempo	87											
	Average all readings	87					91					88	

Fugue (Condensed Entries) mm. 72-77 - II

67	97	102	92	93	62	92	97	102	93	61	101	106	91	98	67	97	94	91
			98					95					96					96
66	94	101	92	88	67	96	94	96	100	64	87	110	94	96	67	99	96	94
			97					95					97					97
66	100	96	93	88	67	93	103	93	96	65	86	109	98	93	68	93	97	94
			98					96					97					96
			98					95					97					96
57	80	97	95	75	57	88	87	82	86	61	73	89	91	86	58	91	81	84
			90					84					86					86
58	87	88	88	82	57	85	89	79	89	61	88	79	81	86	60	85	86	83
			88					84					86					86
56	91	85	87	81	59	85	89	82	84	61	73	86	93	86	59	90	87	82
			88					85					86					87
			89					84					86					86

Fugue mm. 78-81 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		100	67	93	95	94	109	67	97	99	99	105	64
	Average bar tempo						96					101		
	Average Section tempo	93												
	Second Reading													
	Tempo / Beat		94	66	96	97	98	103	70	100	96	94	103	64
	Average bar tempo						97					100		
	Average Section tempo	93												
	Third Reading													
	Tempo / Beat		102	64	95	96	96	105	70	97	98	96	101	67
	Average bar tempo						97					100		
	Average Section tempo	93												
	Average all readings	93					97					100		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		97	59	87	86	81	91	58	89	85	79	87	60
	Average bar tempo						88					86		
	Average Section tempo	80												
	Second Reading													
	Tempo / Beat		96	60	87	89	79	88	57	88	76	86	94	58
	Average bar tempo						88					85		
	Average Section tempo	80												
	Third Reading													
	Tempo / Beat		98	59	84	91	79	92	58	84	79	90	92	61
	Average bar tempo						88					86		
	Average Section tempo	81												
	Average all readings	80					88					86		

Fugue mm. 78-81 - I

96	99	87	110	64	79	75	53
		97					83
94	99	92	108	61	84	73	51
		97					82
96	93	96	108	58	79	75	54
		97					81
		97					82
84	86	84	87	56	60	68	38
		86					67
85	86	84	89	55	73	61	37
		87					68
88	80	85	88	51	71	67	37
		87					68
		87					68

Fugue mm. 78-81 - II

Recording													
Tilson Thomas													
	First Reading												
	Tempo / Beat		104	67	93	106	94	116	66	108	104	98	76
	Average bar tempo						100					105	
	Average Section tempo	96											
	Second Reading												
	Tempo / Beat		96	73	96	100	98	110	66	108	104	94	108
	Average bar tempo						100					103	
	Average Section tempo	96											
	Third Reading												
	Tempo / Beat		100	68	95	98	98	104	69	100	101	100	104
	Average bar tempo						99					102	
	Average Section tempo	96											
	Average all readings	96					99					103	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		87	55	82	90	82	90	55	84	83	86	85
	Average bar tempo						85					85	
	Average Section tempo	78											
	Second Reading												
	Tempo / Beat		85	56	80	90	81	92	56	82	84	83	86
	Average bar tempo						84					85	
	Average Section tempo	79											
	Third Reading												
	Tempo / Beat		82	57	86	84	82	92	55	85	84	83	85
	Average bar tempo						84					85	
	Average Section tempo	79											
	Average all readings	79					84					85	

Fugue mm. 78-81 - II

83	98	103	102	109	58	83	79	61
			101					84
65	94	99	103	113	62	82	75	59
			100					84
65	98	103	101	103	63	84	78	69
			101					86
			101					85
54	85	82	79	81	54	65	65	43
			82					67
54	90	78	80	87	52	66	68	43
			83					68
55	81	81	79	93	48	73	70	42
			82					70
			82					68

Fugue (Grandioso) mm. 82-87 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		74	49	100	90	72	88	53	81	87	87	82	62
	Average bar tempo						82					84		
	Average Section tempo	83												
	Second Reading													
	Tempo / Beat		91	49	94	79	72	89	51	88	88	79	87	52
	Average bar tempo						82					84		
	Average Section tempo	83												
	Third Reading													
	Tempo / Beat		108	52	86	84	70	96	52	71	101	86	82	52
	Average bar tempo						85					86		
	Average Section tempo	84												
	Average all readings	83					83					85		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		77	60	85	85	68	80	60	72	92	79	78	59
	Average bar tempo						81					83		
	Average Section tempo	80												
	Second Reading													
	Tempo / Beat		78	60	81	81	73	79	61	74	79	77	80	63
	Average bar tempo						81					80		
	Average Section tempo	81												
	Third Reading													
	Tempo / Beat		80	57	86	85	72	77	60	73	91	74	88	58
	Average bar tempo						82					81		
	Average Section tempo	81												
	Average all readings	81					81					81		

Fugue (Grandioso) mm. 82-87 - I

67	96	75	91	58	82	83	80	87	53	77	79	92	75	59	90	79	77
		83					85					83					82
87	96	80	80	60	79	83	82	88	83	85	78	80	55	50	100	82	61
		86					83					91					75
92	92	74	85	59	82	84	82	89	54	69	76	101	75	58	107	85	68
		84					84					83					84
		84					84					86					80
86	77	79	96	61	84	88	80	84	56	80	83	86	78	60	72	77	43
		82					88					83					72
89	79	84	92	59	81	87	78	90	60	78	83	87	78	56	80	72	42
		85					85					86					71
82	79	82	95	61	78	86	89	86	54	79	91	83	81	56	85	71	43
		84					88					84					73
		84					87					84					72

Fugue (Grandioso) mm. 82-87 - II

Recording													
Tilson													
	First Reading												
	Tempo / Beat		88	60	92	91	82	97	63	75	98	85	100
	Average bar tempo						89					90	
	Average Section tempo	87											
	Second Reading												
	Tempo / Beat		89	60	88	86	88	93	64	75	82	92	100
	Average bar tempo						88					88	
	Average Section tempo	87											
	Third Reading												
	Tempo / Beat		93	60	83	90	87	98	57	93	92	84	96
	Average bar tempo						89					90	
	Average Section tempo	88											
	Average all readings	87					88					89	
Recording													
Villa-Lobos													
	First Reading												
	Tempo / Beat		92	46	77	72	77	78	43	78	81	63	68
	Average bar tempo						77					73	
	Average Section tempo	69											
	Second Reading												
	Tempo / Beat		87	47	76	73	77	70	47	74	73	69	76
	Average bar tempo						77					71	
	Average Section tempo	69											
	Third Reading												
	Tempo / Beat		93	45	81	75	72	76	42	77	75	70	79
	Average bar tempo						78					72	
	Average Section tempo	69											
	Average all readings	69					77					72	

Fugue (Grandioso) mm. 82-87 - II

62	90	89	75	93	65	87	89	91	98	62	81	80	86	86	60	79	76	76
			89					92					88					81
63	97	79	84	94	65	98	89	85	85	64	81	88	84	83	68	74	74	68
			91					93					87					80
61	86	91	80	95	64	90	89	89	97	61	87	92	86	87	54	85	83	77
			89					92					91					83
			90					92					88					81
49	76	72	69	75	46	73	74	72	73	48	64	69	62	63	40	67	68	51
			72					73					68					62
52	65	67	70	80	47	74	73	72	69	47	59	71	67	64	40	63	70	53
			71					74					67					62
51	66	66	70	80	46	72	73	73	72	48	66	68	63	62	40	65	69	52
			72					73					68					62
			71					73					68					62

Fugue (All Themes) mm.88-92 - I

Recording														
Gerling														
	First Reading													
	Tempo / Beat		95	60	96	93	88	96	64	78	98	93	95	64
	Average bar tempo						92					92		
	Average Section tempo	92												
	Second Reading													
	Tempo / Beat		75	62	101	99	86	93	60	92	91	85	102	63
	Average bar tempo						91					90		
	Average Section tempo	92												
	Third Reading													
	Tempo / Beat		101	61	95	101	91	94	61	81	99	95	93	61
	Average bar tempo						96					92		
	Average Section tempo	93												
	Average all readings	93					93					92		
Recording														
Martinez														
	First Reading													
	Tempo / Beat		95	57	80	81	74	81	54	86	85	73	83	58
	Average bar tempo						83					81		
	Average Section tempo	82												
	Second Reading													
	Tempo / Beat		92	60	78	78	74	82	55	73	79	76	92	57
	Average bar tempo						82					78		
	Average Section tempo	82												
	Third Reading													
	Tempo / Beat		93	57	79	81	76	84	52	82	82	76	90	56
	Average bar tempo						83					80		
	Average Section tempo	82												
	Average all readings	82					83					80		

Fugue (All Themes) mm.88-92 - I

94	92	83	96	64	88	97	86	92	61	92	80	102	99	62	92	96	91	92
		92					93					92					94	
92	96	88	95	61	91	95	92	93	58	88	92	92	95	69	84	91	88	93
		94					93					90					92	
93	97	93	88	60	92	97	90	94	56	101	95	94	95	60	97	94	89	92
		94					91					94					93	
		93					92					92					93	
78	76	82	85	55	84	80	85	80	53	73	83	78						
		81					83					79					0	
84	70	89	85	56	83	78	78	90	53	77	83	81						
		84					82					82					0	
82	76	81	83	58	84	78	81	84	57	73	85	80						
		83					83					82					0	
		83					82					81					0	

Fugue (All Themes) mm.88-92 - I

64	87	100	91	93	62	100	88	91	92	63	93	99	83	98	61	92	84	89
			93					93					92					91
61	94	91	101	97	63	90	90	92	94	64	88	96	90	95	59	89	92	94
			94					93					93					92
63	90	94	95	94	59	101	91	88	102	61	89	102	86	91	61	92	92	89
			93					92					94					91
			93					93					93					91
			0					0					0					0
			0					0					0					0
			0					0					0					0
			0					0					0					0

Fugue (All Themes) mm. 88-92 - II

Recording														
Tilson Thomas														
	First Reading													
	Tempo / Beat		90	57	85	87	94	86	56	95	86	84	90	60
	Average bar tempo						88					87		
	Average Section tempo	87												
	Second Reading													
	Tempo / Beat		97	60	88	87	84	90	59	91	87	86	88	59
	Average bar tempo						89					88		
	Average Section tempo	87												
	Third Reading													
	Tempo / Beat		102	59	85	90	86	95	58	89	92	87	88	54
	Average bar tempo						90					90		
	Average Section tempo	87												
	Average all readings	87					89					88		
Recording														
Villa-Lobos														
	First Reading													
	Tempo / Beat		79	55	91	77	70	75	48	75	81	77	79	49
	Average bar tempo						80					76		
	Average Section tempo	73												
	Second Reading													
	Tempo / Beat		72	53	80	83	71	77	50	68	79	79	79	50
	Average bar tempo						77					76		
	Average Section tempo	73												
	Third Reading													
	Tempo / Beat		76	52	84	77	70	77	44	78	85	78	77	51
	Average bar tempo						77					77		
	Average Section tempo	73												
	Average all readings	73					78					76		

Fugue (All Themes) mm. 88-92 - II

57	92	87	83	86	60	90	86	81	90	59	85	87	82	93	58	82	91	86
			88					87					86					88
56	85	85	90	90	60	88	89	83	91	58	85	90	86	91	55	86	87	92
			85					88					88					88
58	87	84	85	92	55	93	86	83	91	58	88	85	85	94	55	84	86	85
			87					87					87					86
			87					87					87					87
50	67	87	81	72	47	72	71	73	72	48	70	72	77	70	47	67	65	61
			76					72					73					67
47	74	81	78	74	49	68	73	72	72	49	72	65	76	75	46	66	68	64
			75					72					72					68
49	70	82	79	73	48	71	71	70	74	49	70	74	74	73	47	63	67	60
			75					71					73					67
			75					72					72					67

Fugue (All Themes) mm. 88-92 - II

87	81	85	93	61	87	90	86	94	58	86	83	85	79	60	82	82	87	94
		87					90					87					84	
88	83	83	91	59	88	92	93	94	57	87	83	86	75	61	85	85	89	83
		86					90					87					85	
95	88	83	88	58	88	87	96	98	57	86	83	83	84	56	83	86	87	91
		87					89					87					85	
		87					90					87					85	
70	74	66	80	47	72	76	67	72	46	69	68	67	74	50	71	75	70	71
		72					73					69					73	
69	76	67	80	47	69	79	66	73	48	70	65	69	73	49	74	70	73	71
		73					73					70					73	
70	72	68	82	47	67	79	67	75	47	67	69	67	71	51	71	74	70	71
		73					73					70					72	
		73					73					70					73	

Fugue mm. 93-94 - I

Recording												
Gerling												
	First Reading											
	Tempo / Beat		99	59	92	99	94	91	54	84	72	58
	Average bar tempo						94					77
	Average Section tempo	86										
	Second Reading											
	Tempo / Beat		89	68	89	93	92	92	53	91	86	61
	Average bar tempo						93					82
	Average Section tempo	87										
	Third Reading											
	Tempo / Beat		87	59	95	104	92	94	59	82	71	60
	Average bar tempo						93					79
	Average Section tempo	86										
	Average all readings	86					94					79
Recording												
Martinez												
	First Reading											
	Tempo / Beat		89	81	55	77	83	80	43	82	68	56
	Average bar tempo						85					70
	Average Section tempo	78			.							
	Second Reading											
	Tempo / Beat		87	54	77	85	85	87	52	64	67	50
	Average bar tempo						83					69
	Average Section tempo	76										
	Third Reading											
	Tempo / Beat		80	60	74	85	81	87	51	70	63	49
	Average bar tempo						82					69
	Average Section tempo	76										
	Average all readings	76					83					69

Fugue mm. 93-94 - II

Recording												
Tilson Thomas												
	First Reading											
	Tempo / Beat		78	58	84	86	75	93	49	65	64	46
	Average bar tempo						82					68
	Average Section tempo	75										
	Second Reading											
	Tempo / Beat		85	59	72	80	77	86	52	62	62	52
	Average bar tempo						80					68
	Average Section tempo	74										
	Third Reading											
	Tempo / Beat		86	58	73	83	80	85	50	63	61	51
	Average bar tempo						82					67
	Average Section tempo	74										
	Average all readings	75					81					68
Recording												
Villa-Lobos												
	First Reading											
	Tempo / Beat		83	52	56	60	60	75	48	52	50	37
	Average bar tempo						67					57
	Average Section tempo	62										
	Second Reading											
	Tempo / Beat		90	44	63	65	70	71	38	61	51	41
	Average bar tempo						71					56
	Average Section tempo	64										
	Third Reading											
	Tempo / Beat		83	52	52	64	62	68	45	57	53	43
	Average bar tempo						68					58
	Average Section tempo	63										
	Average all readings	63					69					57

Fugue (Meno) mm. 95-97 - I

Recording							
Gerling							
	First Reading						
	Tempo / Beat		88	58	78	91	78
	Average bar tempo						84
	Average Section tempo	79					
	Second Reading						
	Tempo / Beat		81	56	84	88	70
	Average bar tempo						81
	Average Section tempo	78					
	Third Reading						
	Tempo / Beat		90	62	80	83	68
	Average bar tempo						83
	Average Section tempo	78					
	Average all readings	78					83
Recording							
Martinez							
	First Reading						
	Tempo / Beat		69	53	75	69	73
	Average bar tempo						73
	Average Section tempo	65					
	Second Reading						
	Tempo / Beat		71	50	66	70	68
	Average bar tempo						70
	Average Section tempo	64					
	Third Reading						
	Tempo / Beat		83	48	68	71	69
	Average bar tempo						73
	Average Section tempo	64					
	Average all readings	64					72

Fugue (Meno) mm. 95-97 - I

84	53	80	83	71	80	44	88	73	62
				80					74
85	55	78	82	75	79	43	90	69	57
				80					72
82	53	80	77	79	79	49	73	71	59
				80					71
				80					72
71	46	63	68	68	67	43	59	53	21
				68					53
74	45	61	74	68	65	43	60	49	20
				69					52
72	44	65	71	68	68	43	58	50	20
				68					52
				68					52

Fugue (Meno) mm. 95-97 - II

Recording							
Tilson Thomas							
	First Reading						
	Tempo / Beat		69	42	68	62	59
	Average bar tempo						64
	Average Section tempo	60					
	Second Reading						
	Tempo / Beat		67	43	63	66	55
	Average bar tempo						63
	Average Section tempo	60					
	Third Reading						
	Tempo / Beat		70	40	68	65	56
	Average bar tempo						64
	Average Section tempo	61					
	Average all readings	60					64
Recording							
Villa-Lobos							
	First Reading						
	Tempo / Beat		53	38	58	52	51
	Average bar tempo						54
	Average Section tempo	52					
	Second Reading						
	Tempo / Beat		67	31	55	51	52
	Average bar tempo						54
	Average Section tempo	52					
	Third Reading						
	Tempo / Beat		67	31	55	51	52
	Average bar tempo						54
	Average Section tempo	52					
	Average all readings	52					54

Fugue (Meno) mm. 95-97 - II

59	42	59	59	54	60	39	61	58	51
				59					58
61	43	61	57	55	60	37	62	58	54
				60					58
62	41	60	59	53	60	39	60	58	58
				59					59
				59					58
52	34	46	54	40	37	34	50	58	65
				49					52
53	33	44	64	38	39	30	57	61	63
				50					53
53	33	44	64	38	39	30	57	61	63
				50					53
				49					53

Fugue (Final Allargando) mm. 98-99 - I

Recording		M.98						M.99
Gerling		Beat	1	2	3	4	5	
	First Reading							sec.
	Tempo / Beat		39	20	25	29	17	6.7
	Compensated second beat			30				
	Average bar tempo	28						49
	Second Reading							sec.
	Tempo / Beat		41	19	26	27	19	6.5
	Compensated second beat			28				
	Average bar tempo	28						51
	Third Reading							sec.
	Tempo / Beat		39	20	24	28	18	6.5
	Compensated second beat			30				
	Average bar tempo	28						51
	Average for Reeading	28	40	30	25	28	18	50
	Average for section	39						
Recording		M.98						M.99
Martinez		Beat	1	2	3	4	5	
	First Reading							sec.
	Tempo / Beat		60	42	49	46	23	4.1
	Compensated second beat			63				
	Average bar tempo	48						80
	Second Reading							sec.
	Tempo / Beat		52	44	53	51	23	4.4
	Compensated second beat			66				
	Average bar tempo	49						75
	Third Reading							sec.
	Tempo / Beat		71	41	47	31	29	4.3
	Compensated second beat			62				
	Average bar tempo	48						77
	Average for Reeading	48	61	64	50	43	25	77
	Average for section	63						

Fugue (Final Allargando) mm. 98-99 II

Recording										M.99
Tilson Thomas		Beat	1	2	1b	2b	3	4	5	
	First Reading									sec.
	Tempo / Beat		54	37	60	29	27	32	14	6.5
	Compensated second beat			56		44				
	Average bar tempo	41								51
	Second Reading									sec.
	Tempo / Beat		56	37	52	29	28	33	14	6.4
	Compensated second beat			56		44				
	Average bar tempo	40								52
	Third Reading									sec.
	Tempo / Beat		56	37	54	29	29	31	14	6.4
	Compensated second beat			56		44				
	Average bar tempo	40								52
	Average for Reading	41	55	56	55	44	28	32	14	51
	Average for section	36								
Recording										M.99
Villa-Lobos		Beat	1	2	3	4	5			
	First Reading									sec.
	Tempo / Beat		53	24	31	32	18			8.8
	Compensated second beat			36						
	Average bar tempo	34								38
	Second Reading									sec.
	Tempo / Beat		57	22	31	28	20			8.7
	Compensated second beat			33						
	Average bar tempo	34								38
	Third Reading									sec.
	Tempo / Beat		57	22	31	28	20			8.7
	Compensated second beat			33						
	Average bar tempo	34								38
	Average for Reading	34	56	34	31	29	19			38
	Average for section	17								

APPENDIX C

DMA RECITAL PROGRAMS

THE UNIVERSITY OF IOWA
SCHOOL OF MUSIC

STUDENT RECITAL

FREDI GERLING, *Violin*
CRISTINA CAPPARELLI GERLING, *Piano*

MONDAY, OCTOBER 7, 1996, AT 8:00 P.M. HARPER HALL

PROGRAM

Sonata for Violin and Cembalo BWV 1016 — Johann Sebastian Bach (1685–1750)

Adagio
Allegro
Adagio ma non tanto
Allegro

Sonata for Piano and Violin KV 454 — Wolfgang Amadeus Mozart (1756–1791)

Largo — Allegro
Andante
Allegretto

INTERMISSION

Sonata for Piano and Violin op. 96 — Ludwig Van Beethoven (1770–1827)

Allegro moderato
Adagio espressivo
Scherzo — Allegro
Poco Allegretto

This Program is being presented by Fredi Gerling as an optional recital.

Student Series No.039. 1996-97 Season.

THE UNIVERSITY OF IOWA
SCHOOL OF MUSIC

STUDENT RECITAL

FREDI GERLING, *Violin*
CRISTINA CAPPARELLI GERLING, *Piano*

SATURDAY, MAY 10, 1997, AT 5:00 P.M. HARPER HALL

PROGRAM

Partita in d minor for Violin Solo BWV 1004 — Johann Sebastian Bach (1685–1750)

Allemanda
Corrente
Sarabanda
Giga
Ciaccona

INTERMISSION

Sonata for Violin and Piano Opus 121 — Robert Schumann (1810-1856)

Ziemlich langsam-Lebhaft
Sehr lebhaft
Leise, einfach
Bewegt

Sonâncias II for Violin and Piano (1981) — Edino Krieger (1928-)

Lento espressivo

This Program is being presented by Fredi Gerling as a qualifying recital for admission to the curriculum of the Doctor of Musical Arts degree in Violin Performance and Pedagogy and in partial fulfillment of the requirements for the Doctor of Musical Arts degree in Violin Performance and Pedagogy.

Student Series No. 250, 1996-97 Season.

THE UNIVERSITY OF IOWA
SCHOOL OF MUSIC

STUDENT RECITAL

FREDI GERLING, *Violin*
CRISTINA CAPPARELLI GERLING, *Piano*

SUNDAY, FEB 15, 1998, AT 4:00 P.M. HARPER HALL

PROGRAM

Sonata for Violin and Piano Opus 30, n° 1 — Ludwig van Beethoven (1770-1827)

Allegro
Adagio molto espressivo
Allegretto con variazioni

Phantasy for Violin with Piano accompaniment op.47 — Arnold Schoenberg (1874-1951)

INTERMISSION

Ciaccona for Violin Solo from the Partita in d minor BWV 1004 — Johann Sebastian Bach (1685–1750)

Sonata in A Major for Violin and Piano — César Franck (1822- 1890)

Allegretto ben moderato
Allegro
Recitativo—Fantasia
Allegretto poco mosso

This Program is being presented by Fredi Gerling as an optional recital.
Student Series No. 260, 1997-98 Season.

THE UNIVERSITY OF IOWA
SCHOOL OF MUSIC

STUDENT RECITAL

FREDI GERLING, *Violin*
assisted by
MARIT HERVIG, *Viola*
JACQUELINE EMERY, *Violoncelo*
CHRISTINE BELLOMY, *Clarinet*
CRISTINA CAPPARELLI GERLING, *Piano*

SATURDAY, APRIL 11, 1998, AT 4:30 P.M. HARPER HALL

PROGRAM

Contrasts for Violin, Clarinet and Pianoforte — Béla Bártok (1881-1945)

Verbunkos (Recruiting Dance)
Pihenö (Relaxation)
Sebes (Fast Dance)

INTERMISSION

Piano Quartet in G Minor Op. 25 — Johannes Brahms (1833-1897)

Allegro
Intermezzo- Allegro ma non troppo
Andante con moto
Rondo alla Zingarese - Presto

This Program is being presented by Fredi Gerling in partial fulfillment of the requirements for the Doctor of Musical Arts degree in Violin Performance and Pedagogy.
Student Series No. 295, 1997-98 Season.

THE UNIVERSITY OF IOWA
SCHOOL OF MUSIC

STUDENT RECITAL

FREDI GERLING, *Violin*
CRISTINA CAPPARELLI GERLING, *Piano*

SUNDAY, JANUARY 31, 1999, 4:30 PM HARPER HALL

PROGRAM

Sonata for Violin and Piano, Opus 9 — Karol Szymanowski
(1882-1937)

Allegro moderato - Patetico
Andantino tranquillo e dolce
Allegro molto, quasi presto

* * *

Sonata n°1 for Violin and Piano in F minor, Opus 80 — Sergei Prokoffief
(1891-1953)

Andante assai
Allegro brusco
Andante
Allegrissimo

* * *

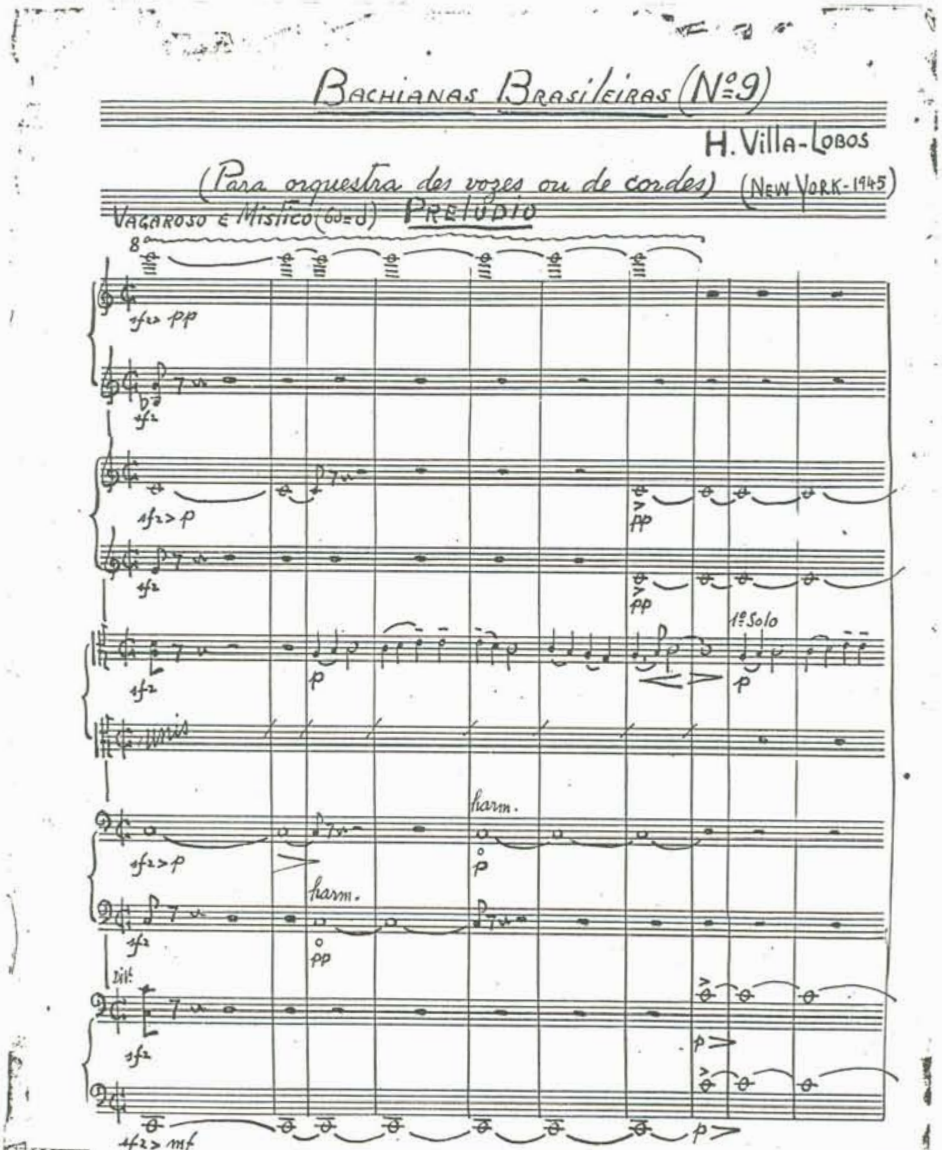
Sonata for Violin and Piano in B minor (1917) — Ottorino Respighi
(1879-1936)

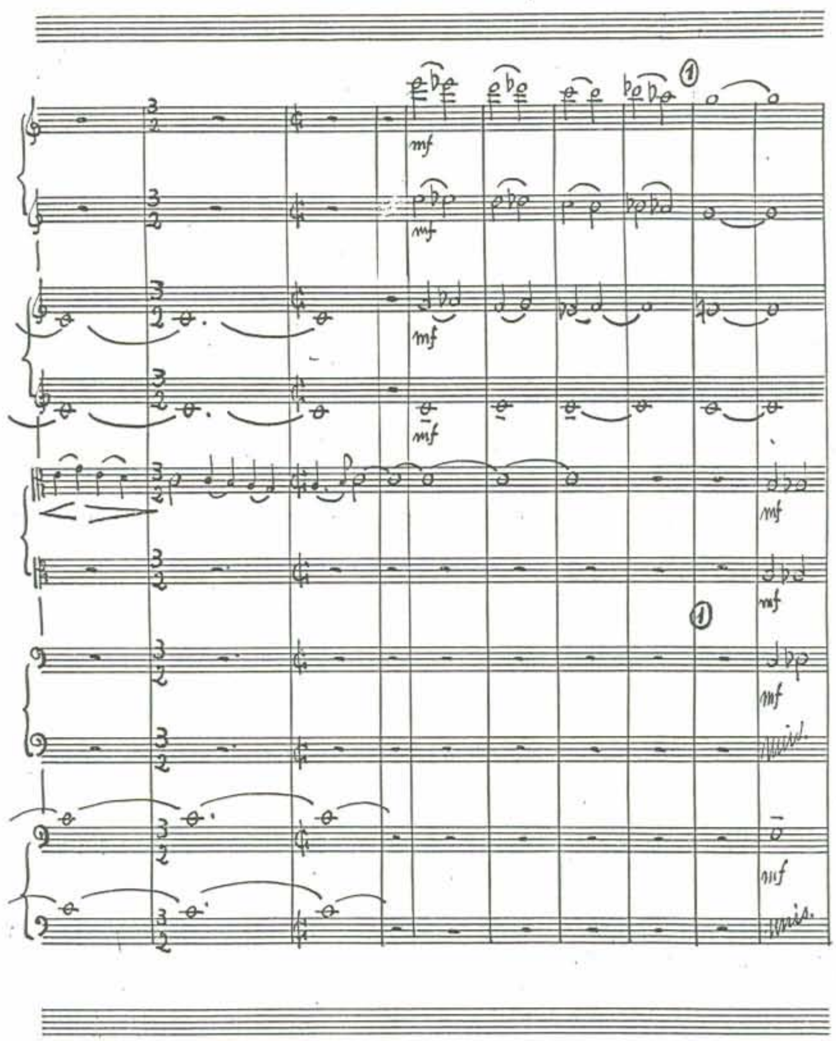
Moderato
Andante espressivo
Passacaglia- Allegro moderato ma energico

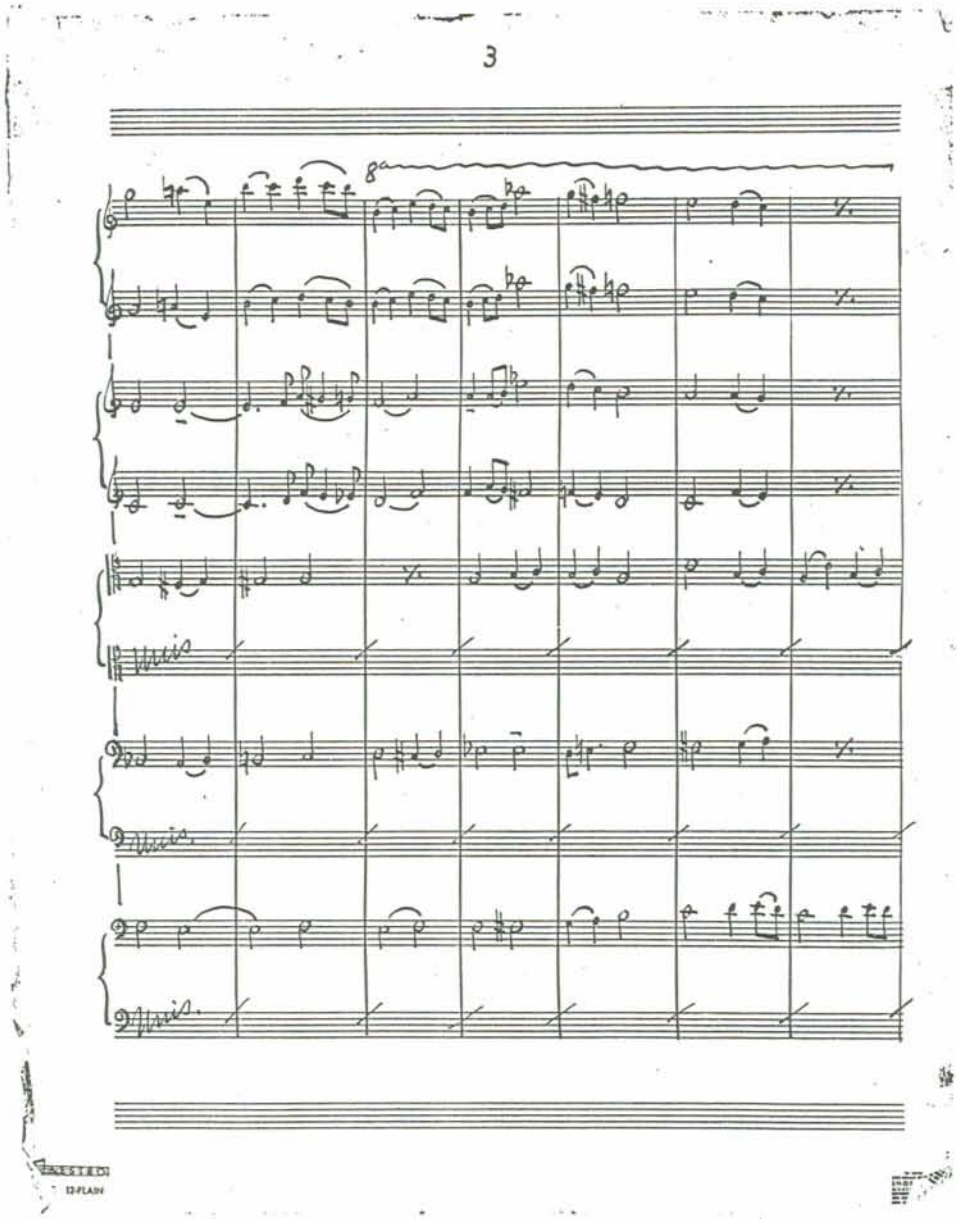
This Program is being presented by Fredi Gerling in partial fulfillment of the requirements for the Doctor of Musical Arts degree in Violin Performance and Pedagogy.
Student Series No. 263, 1998-99 Season.

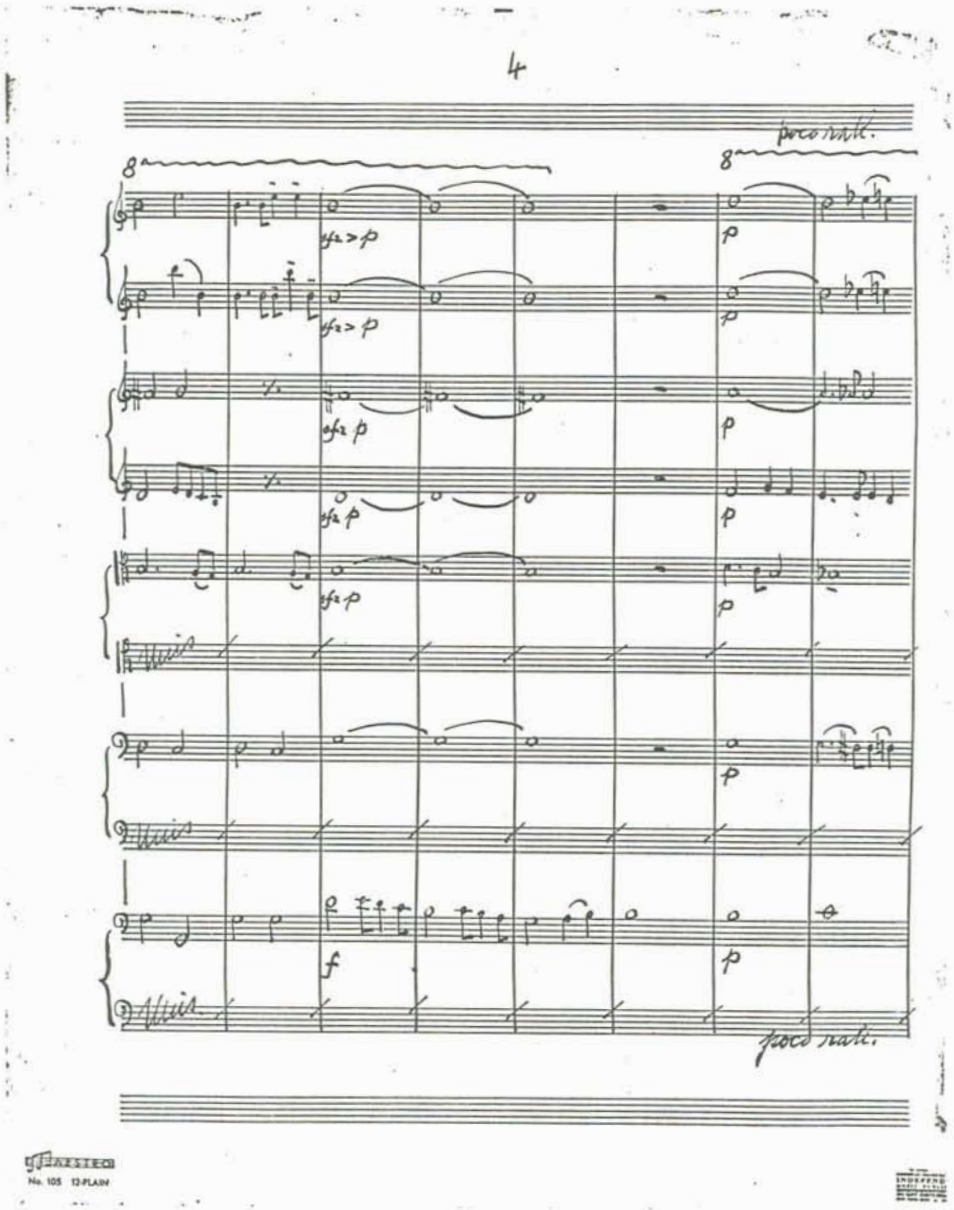
APPENDIX D

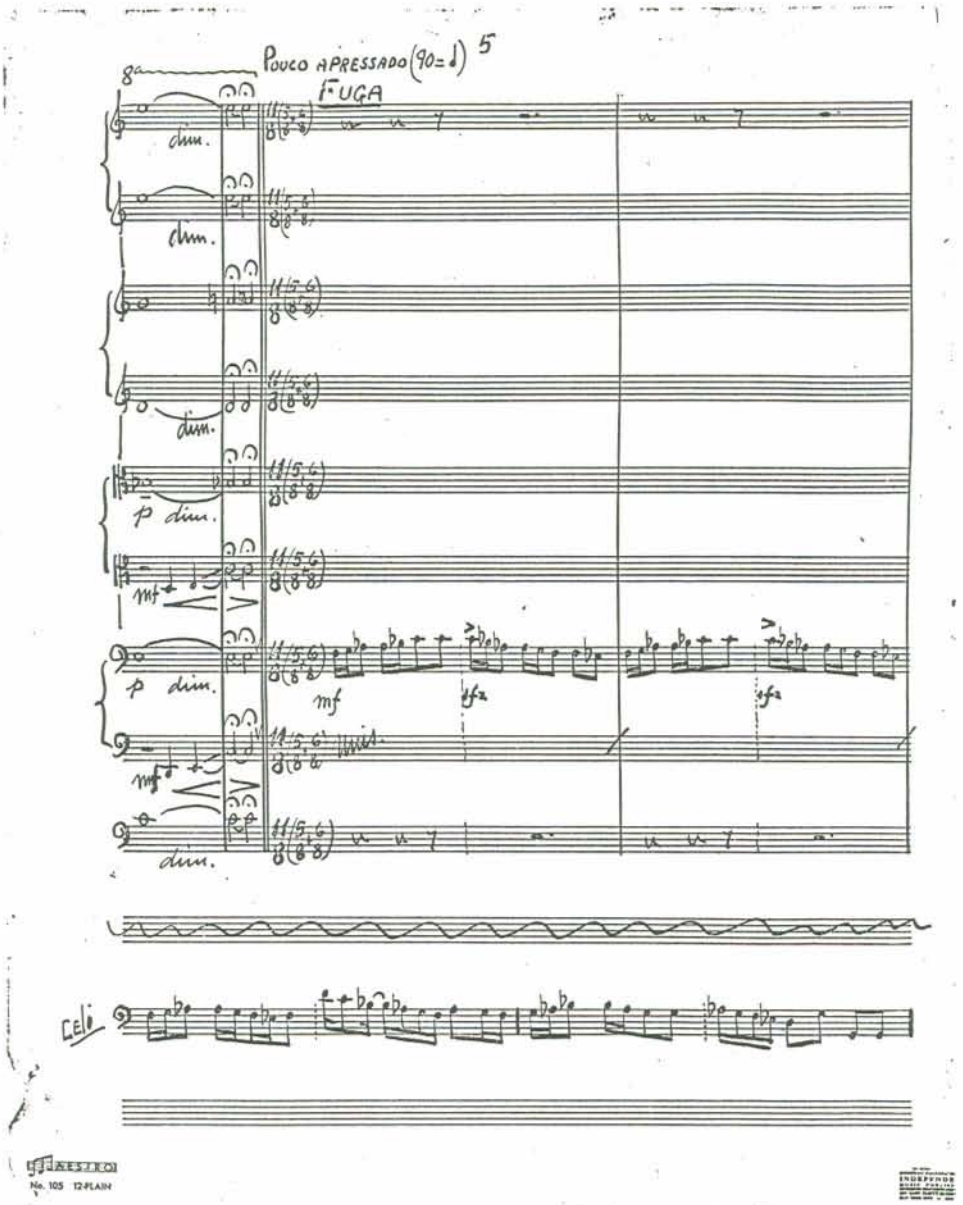
BACHIANAS BRASILEIRAS NO. 9 STRING VERSION VILLA-LOBOS'S AUTOGRAPH

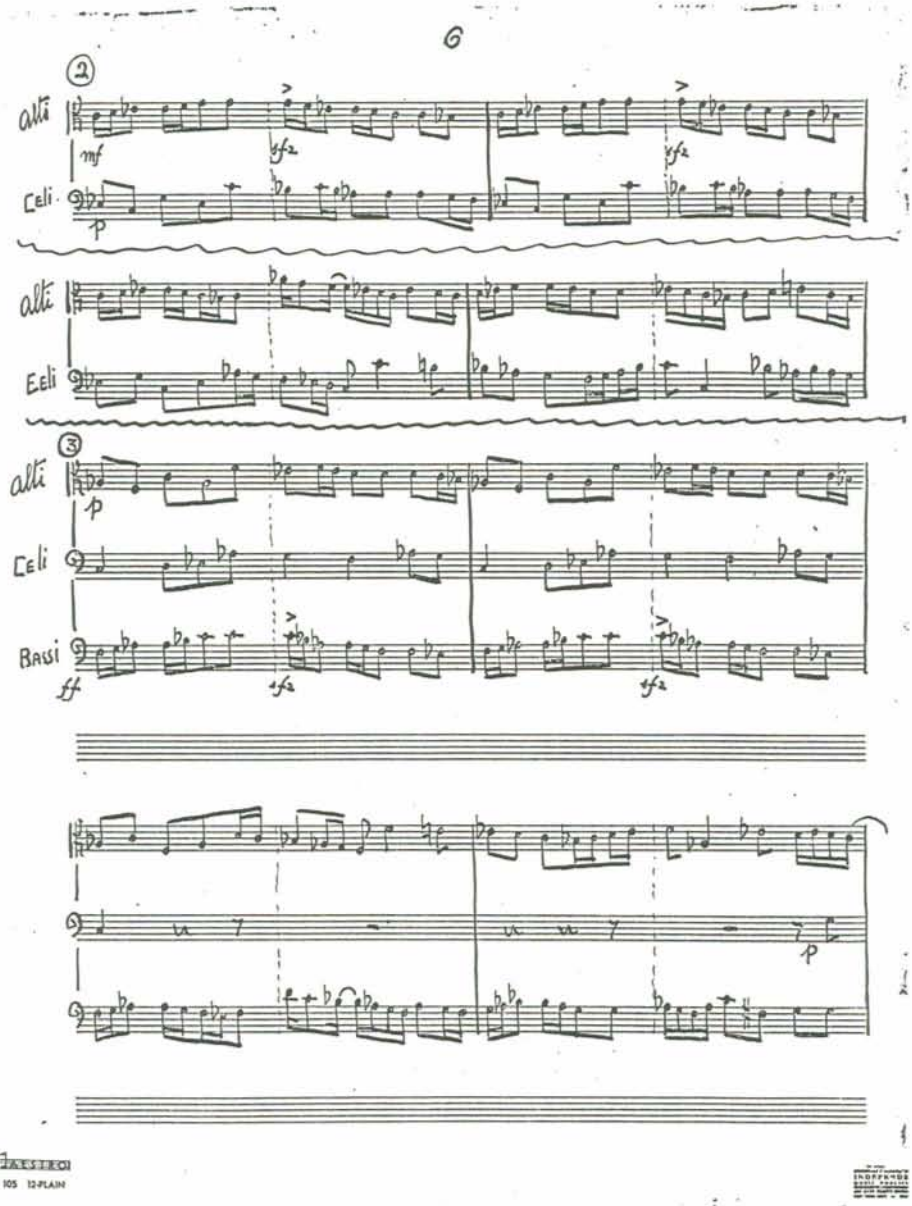


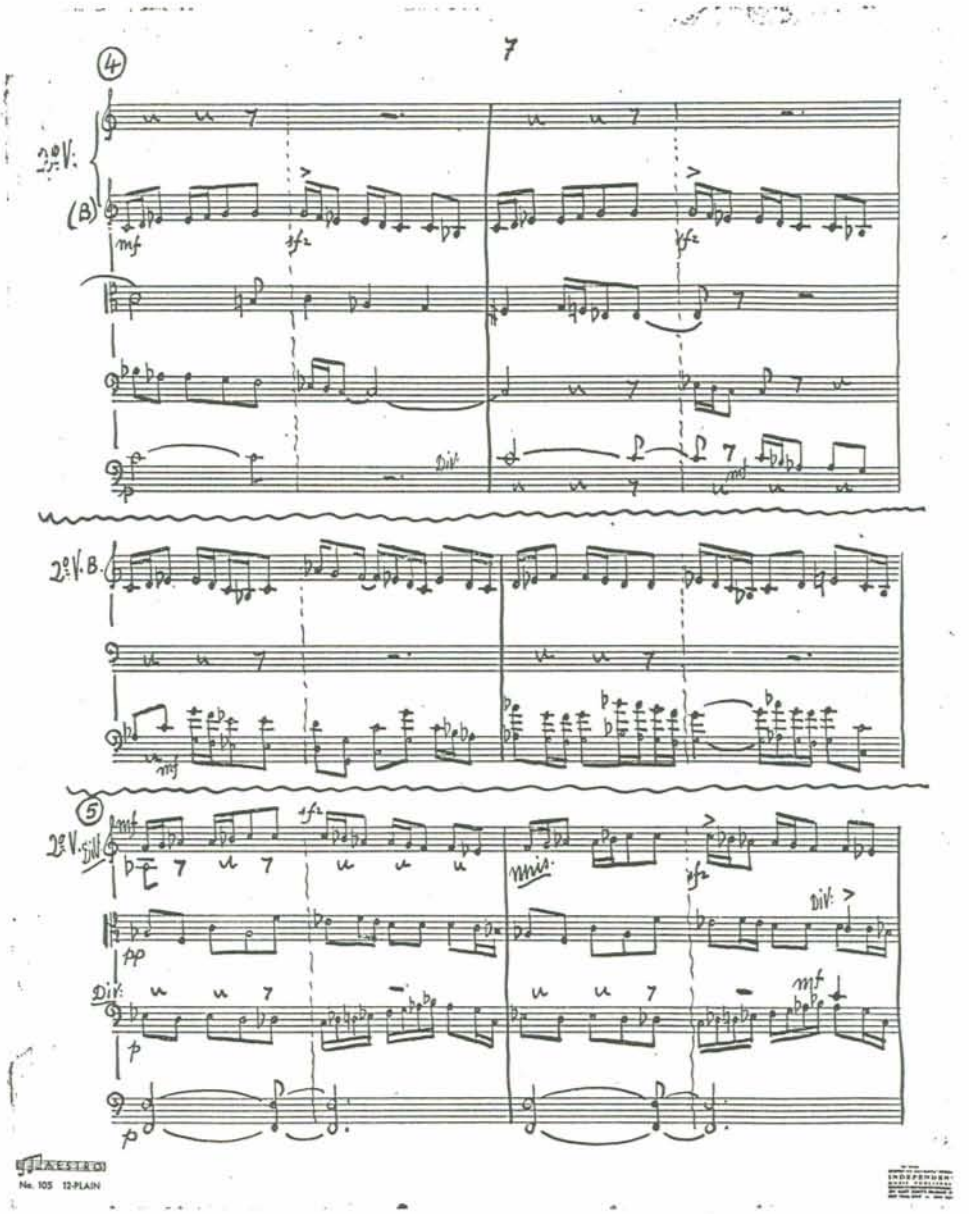


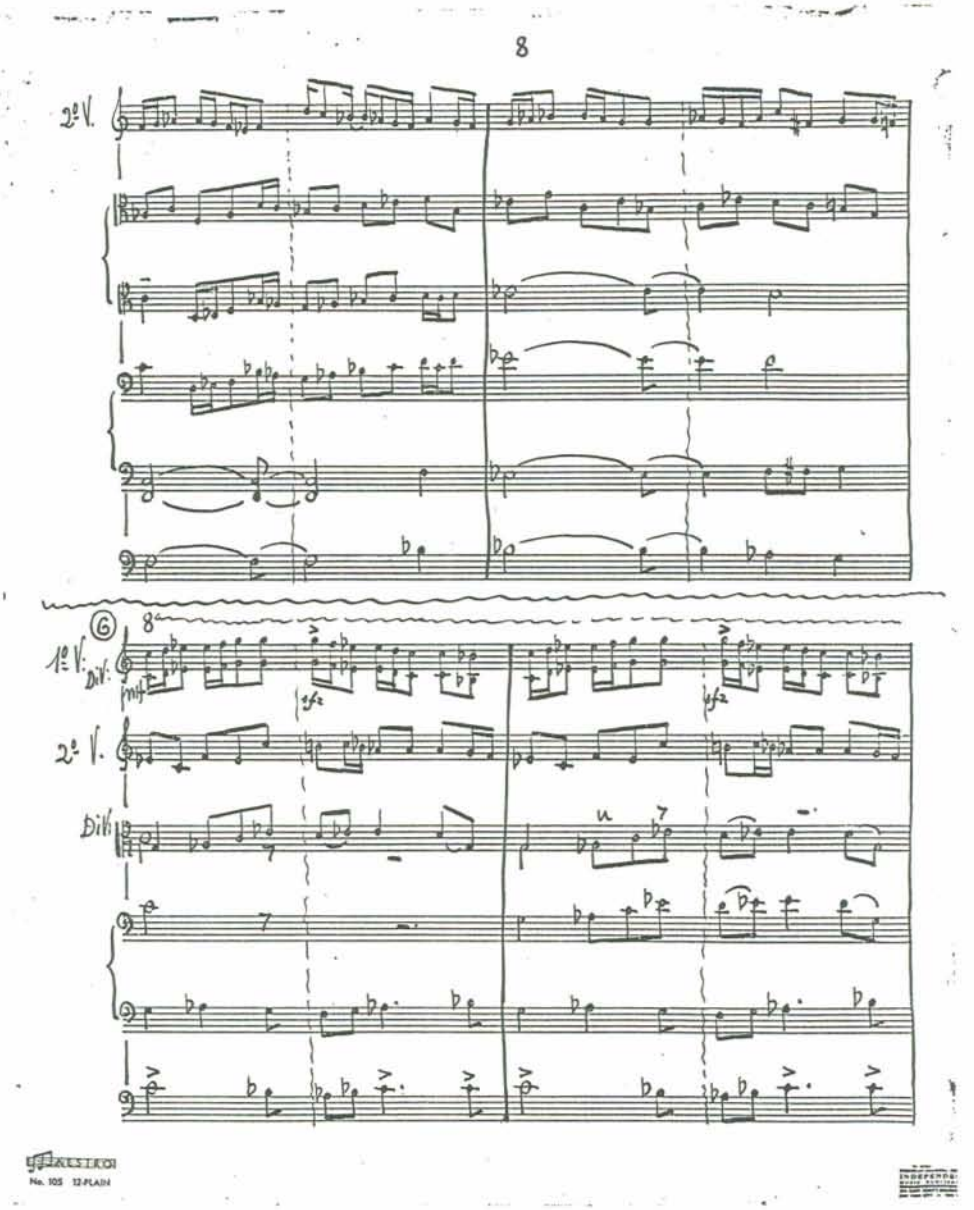


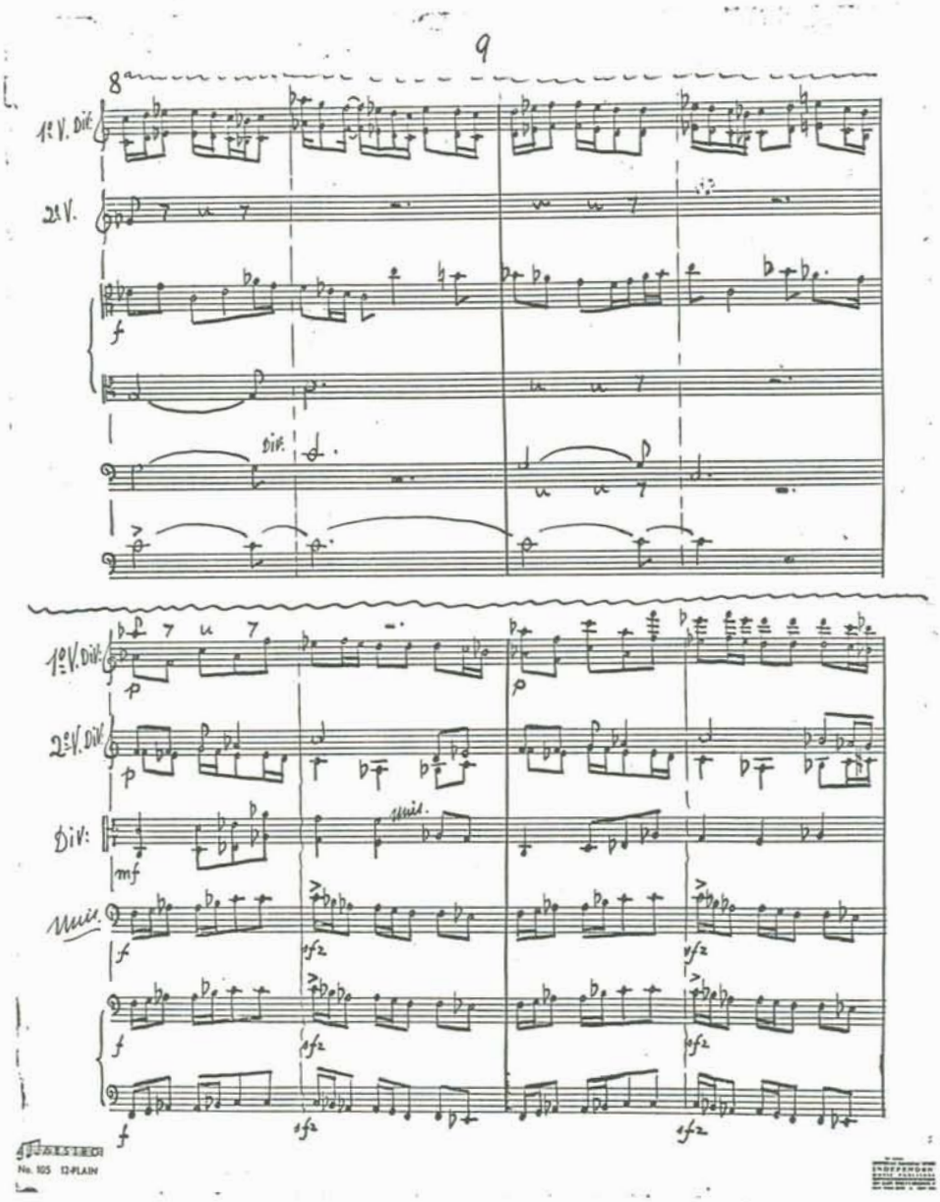


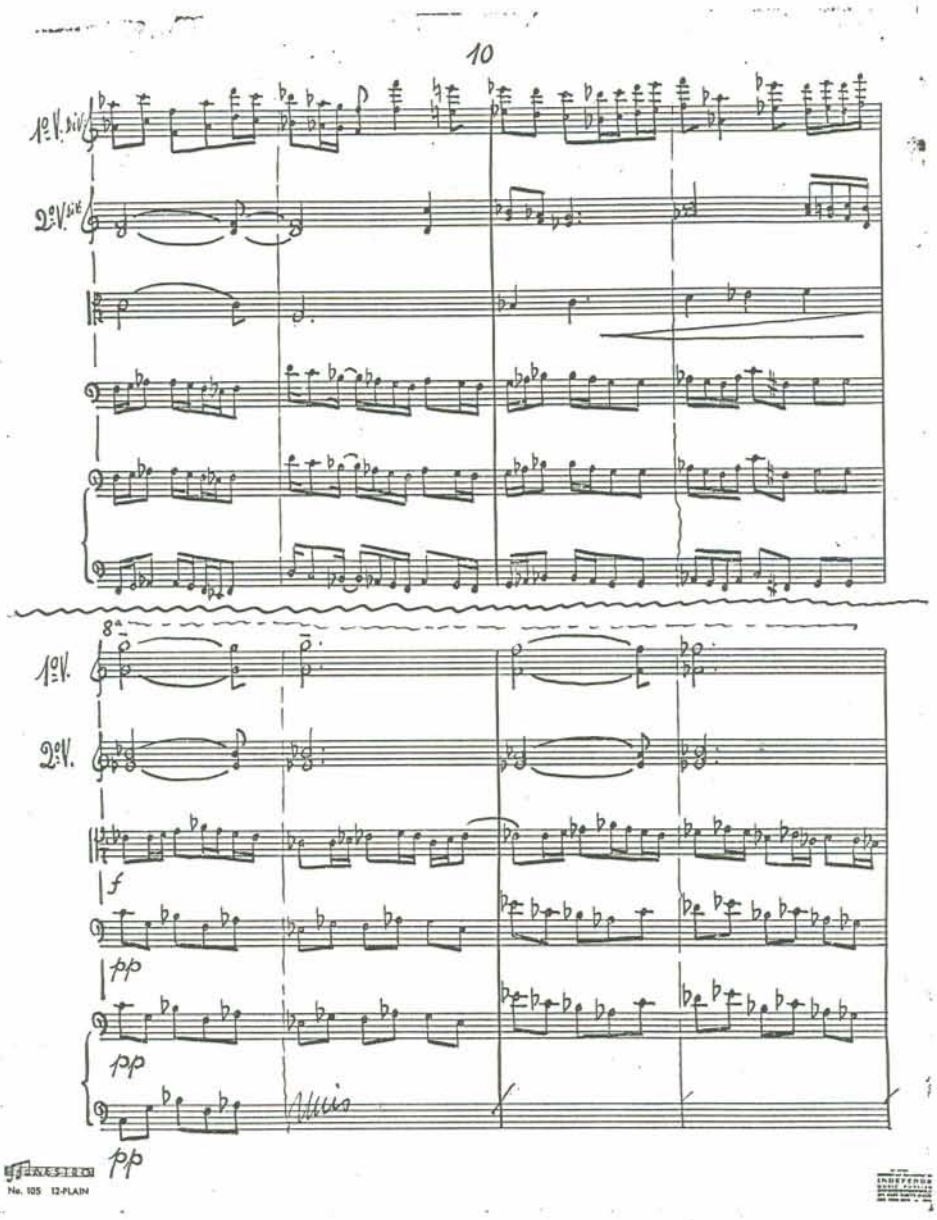


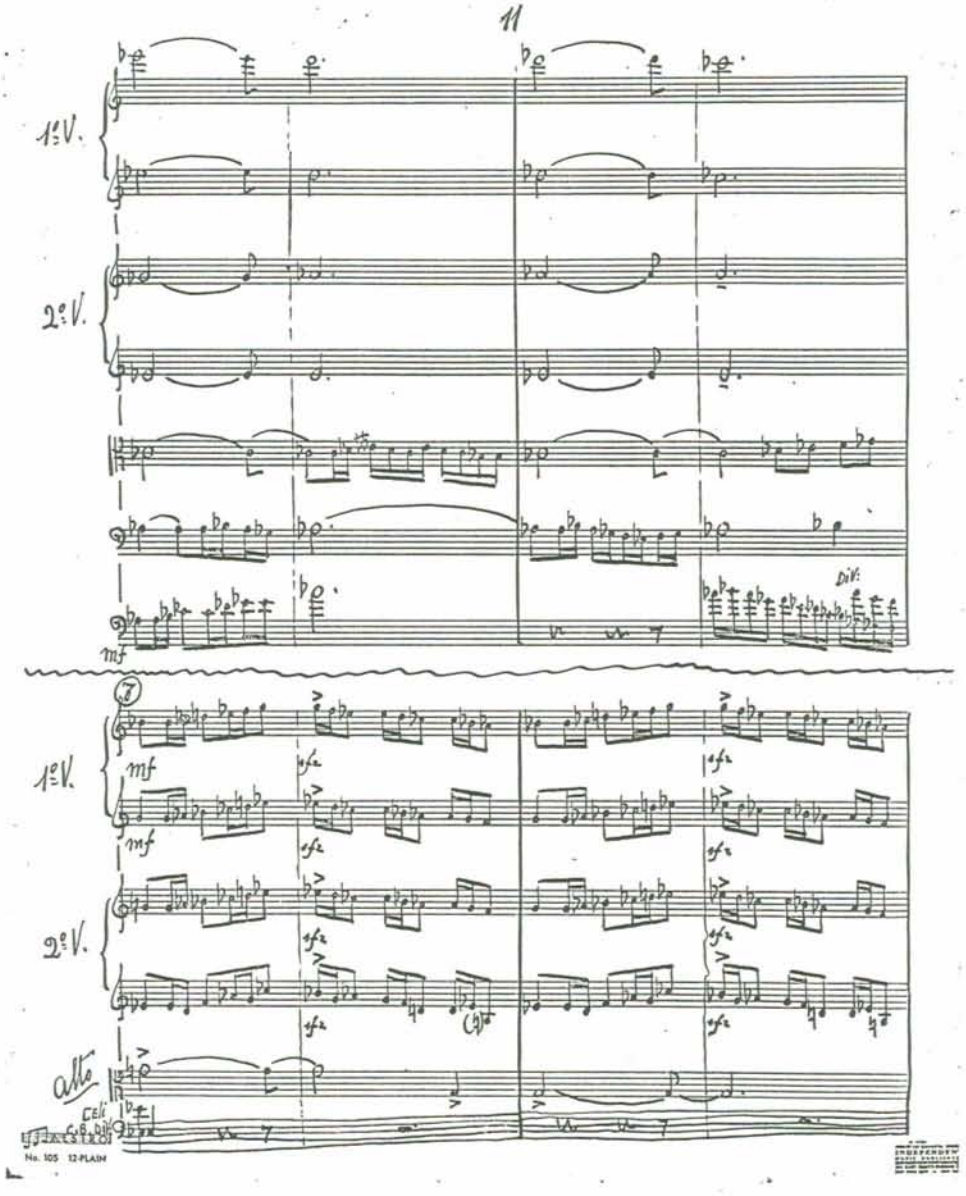


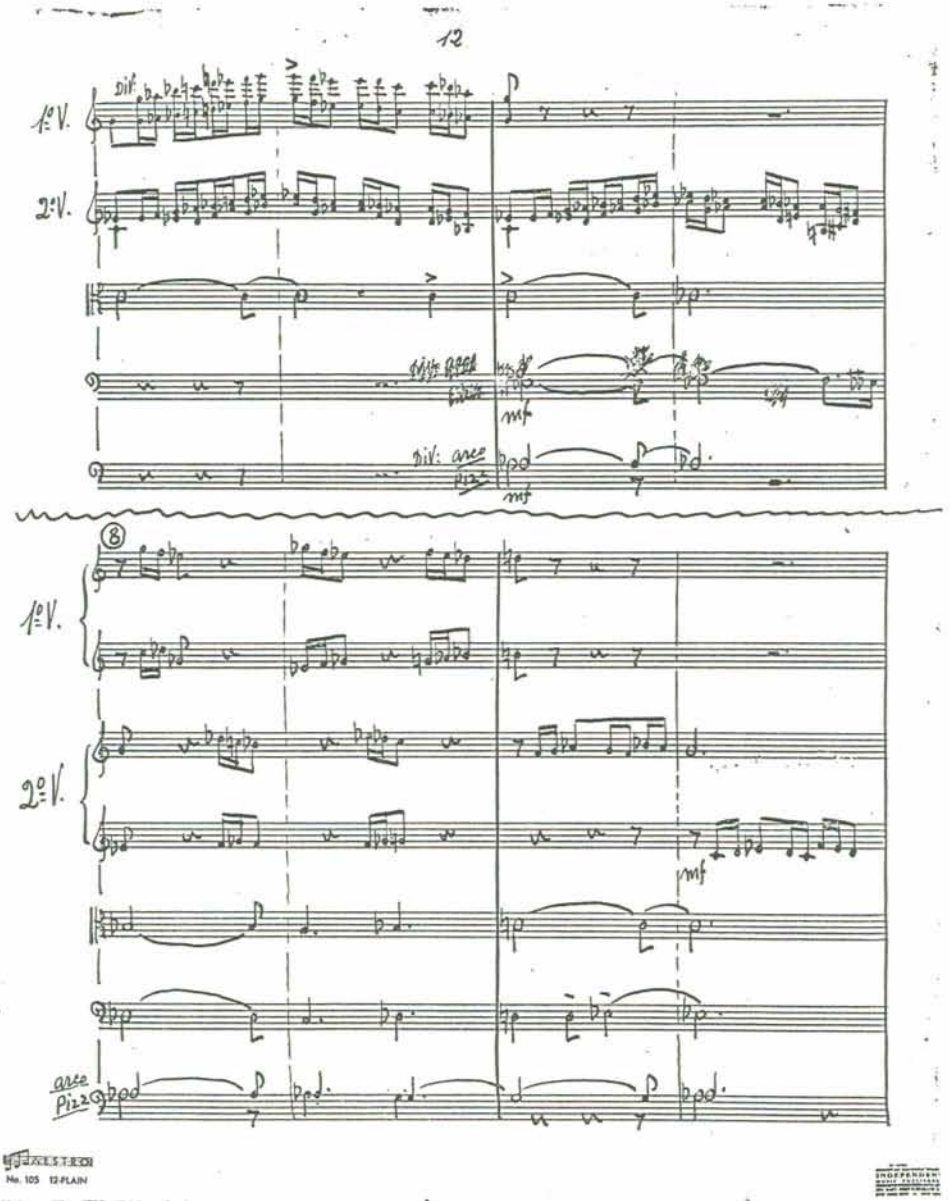


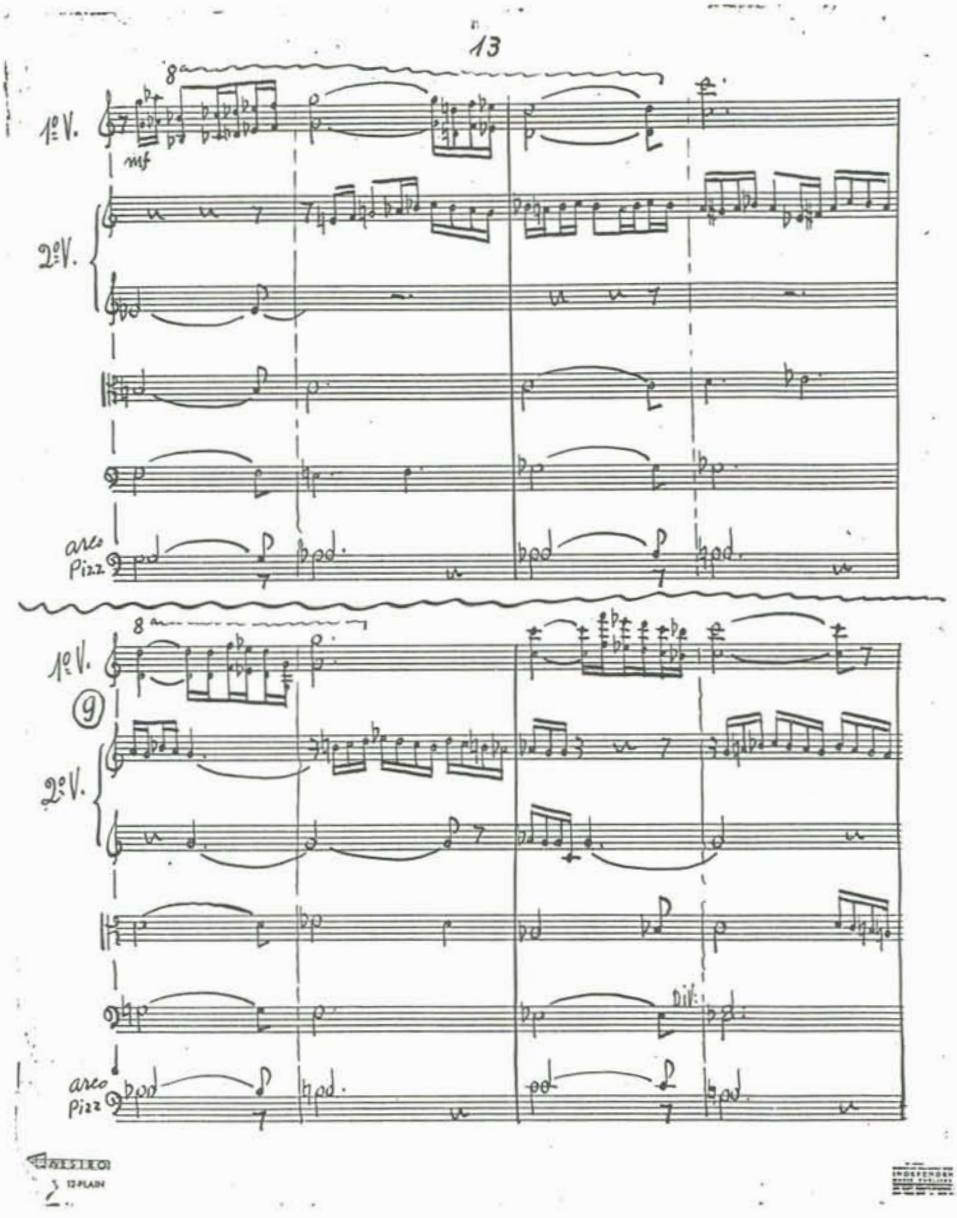


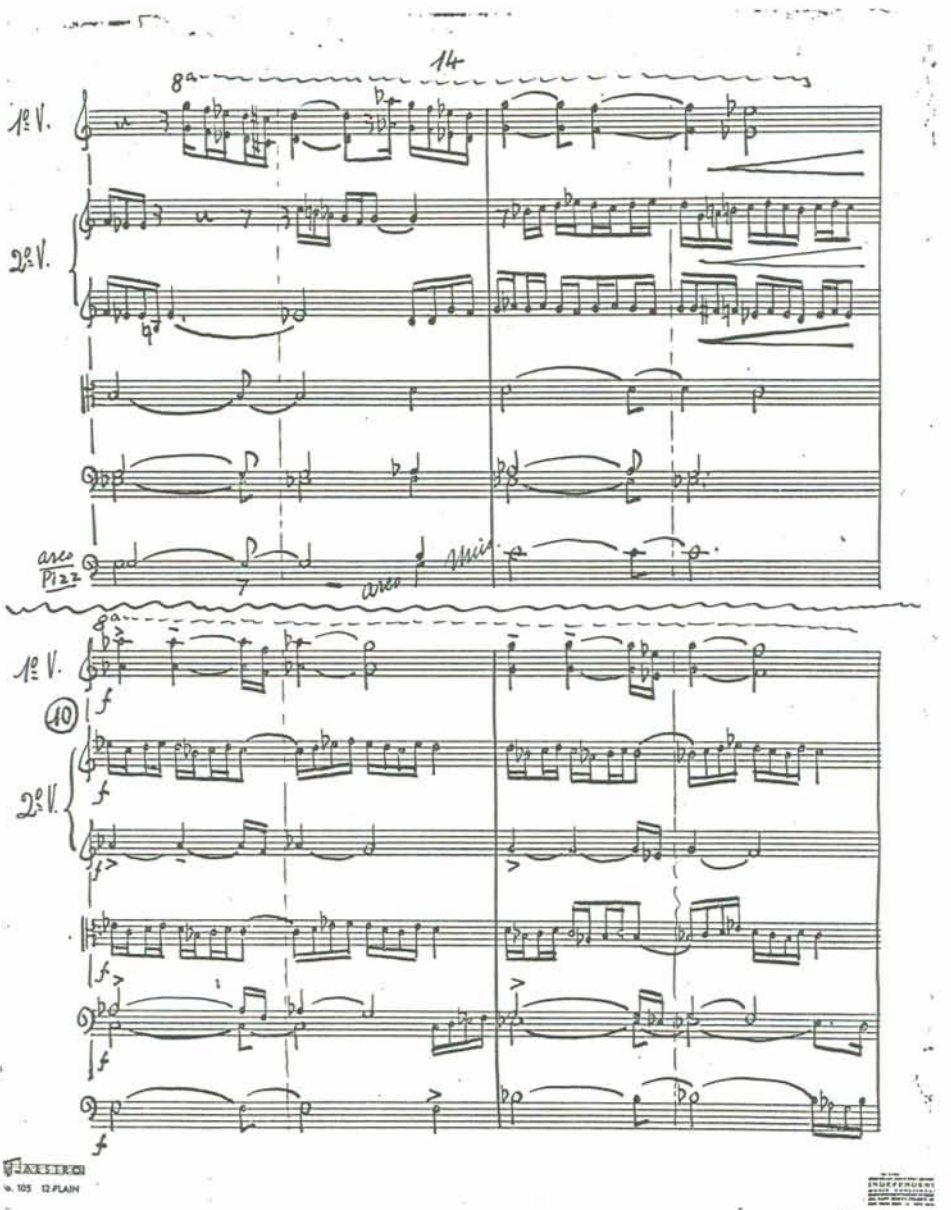


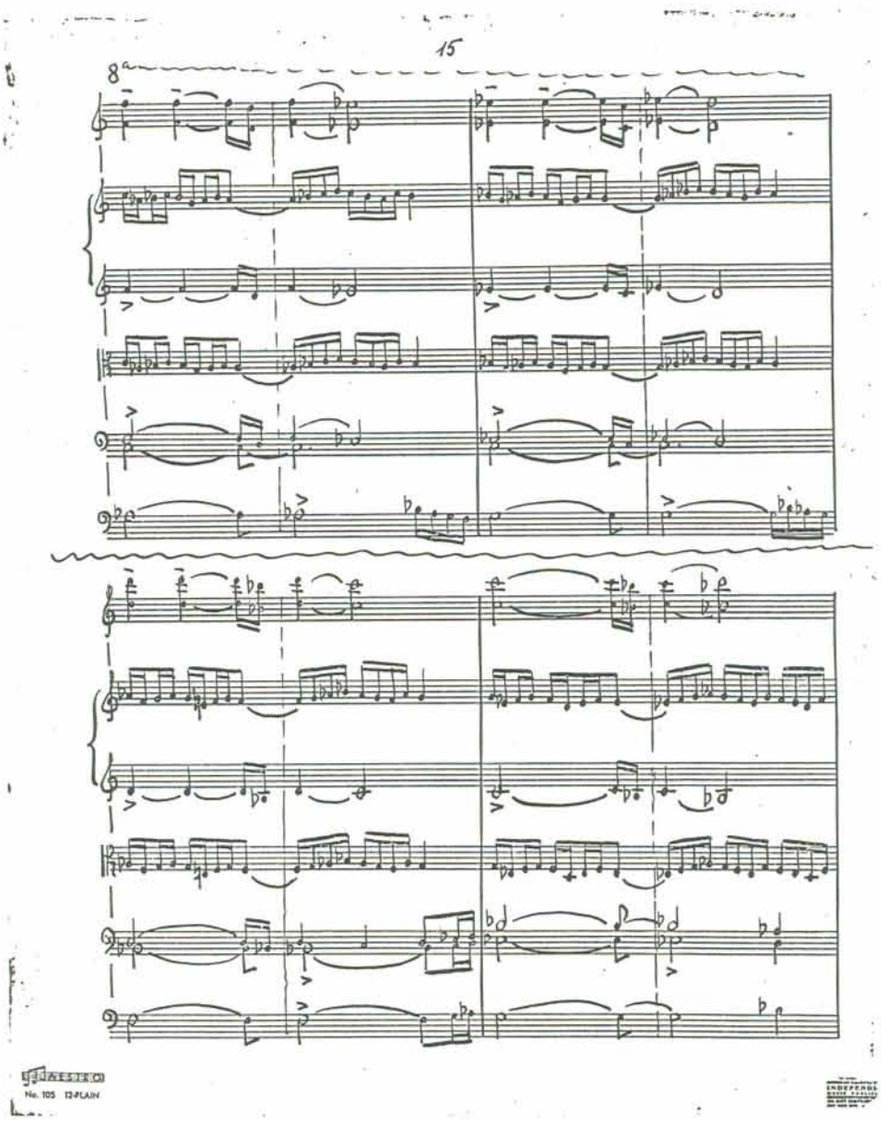


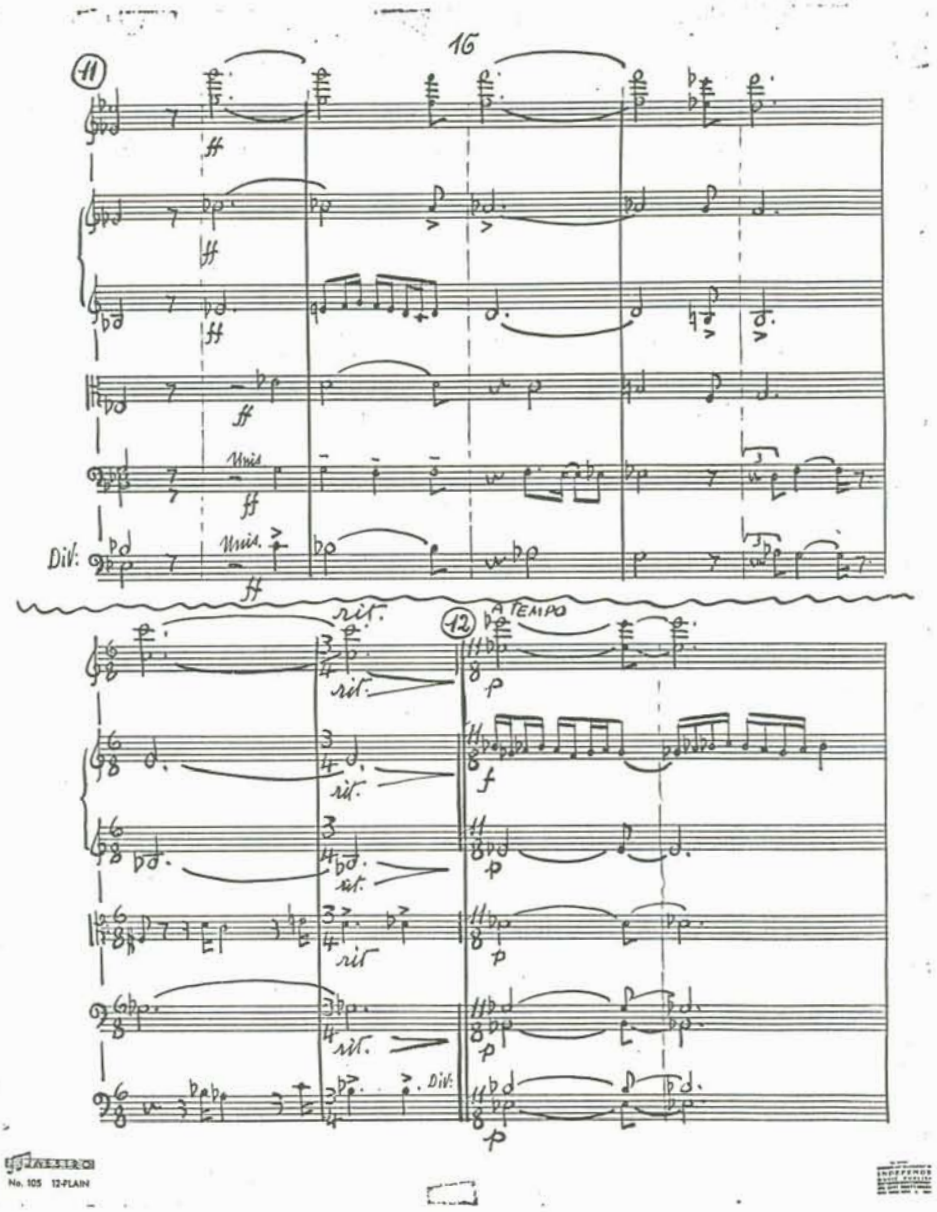


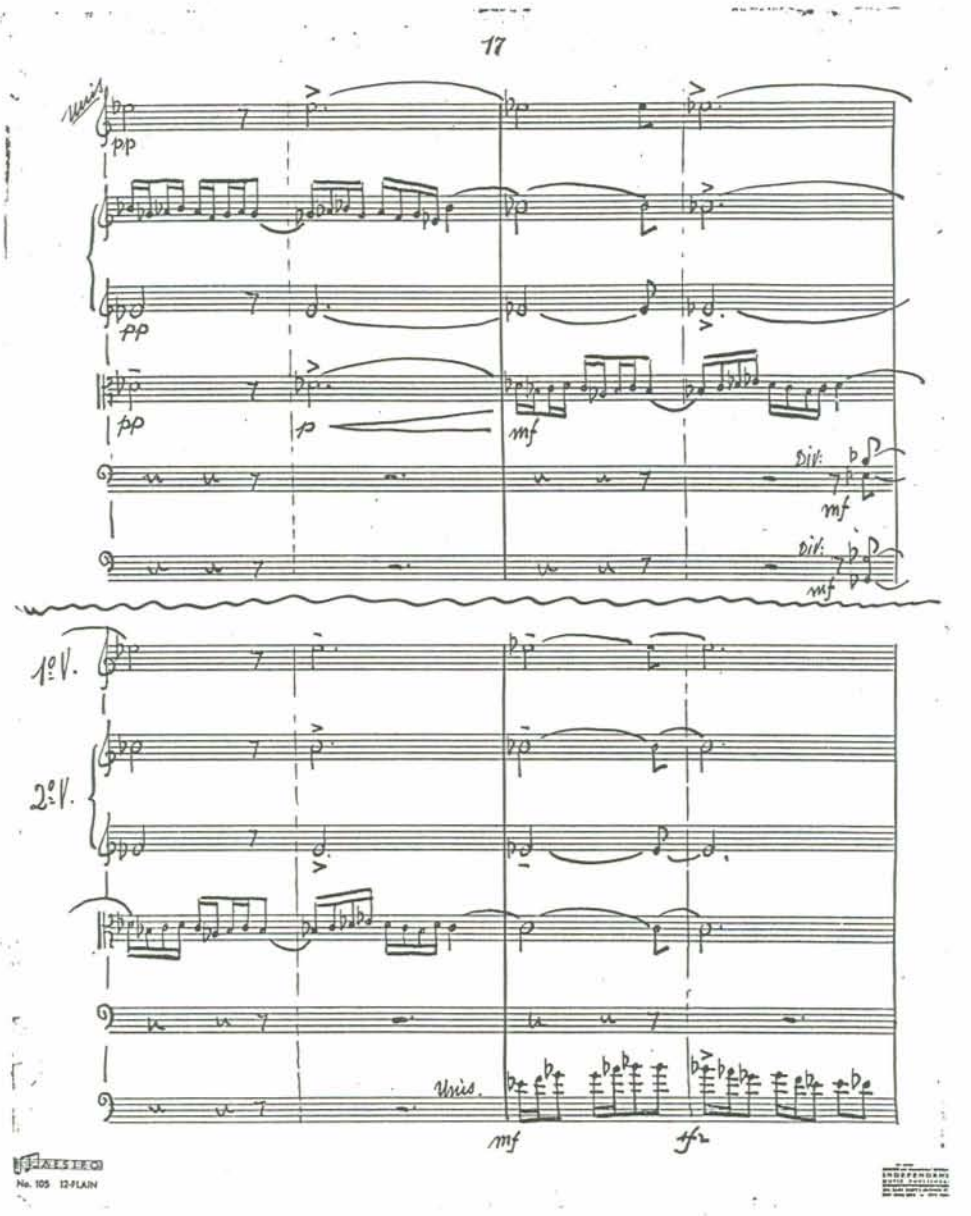


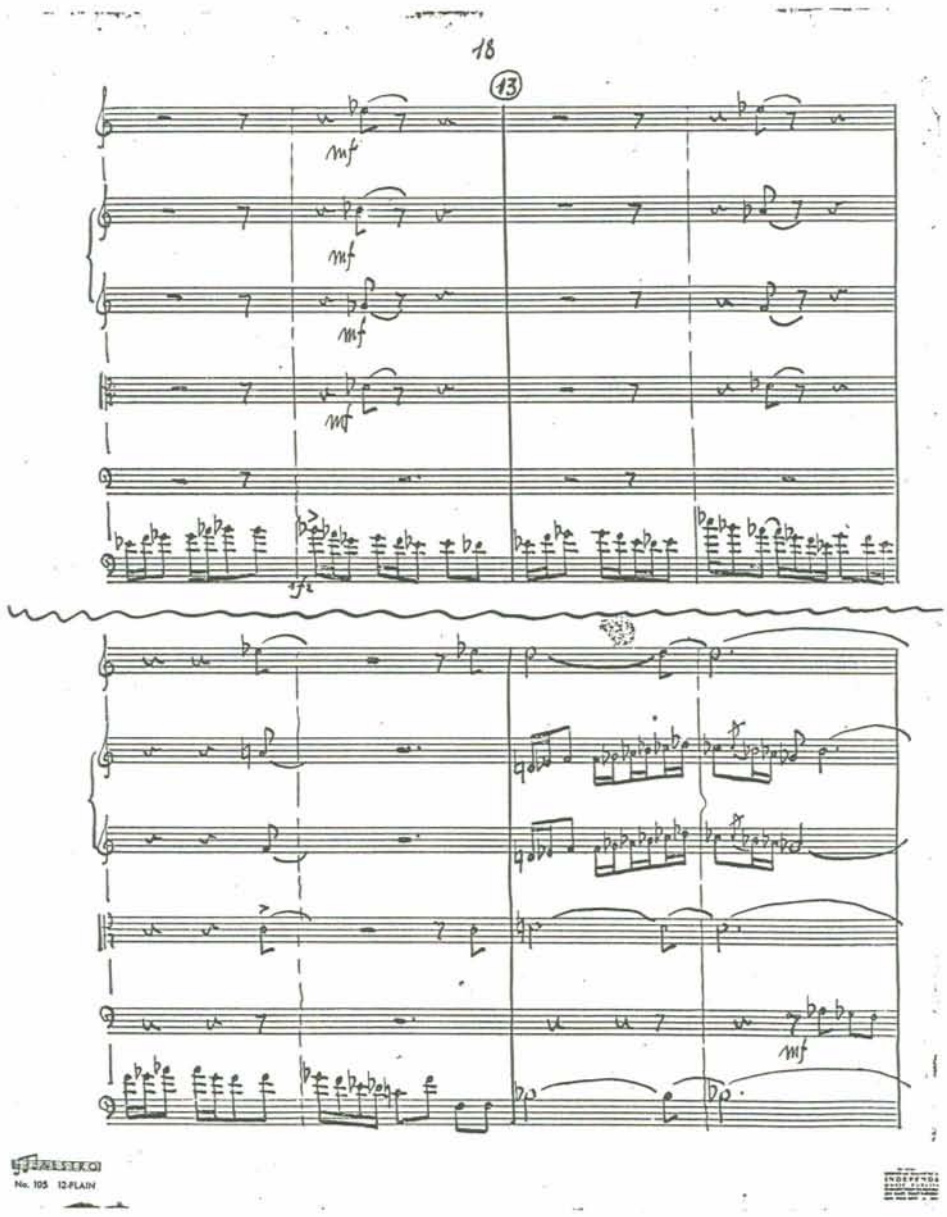


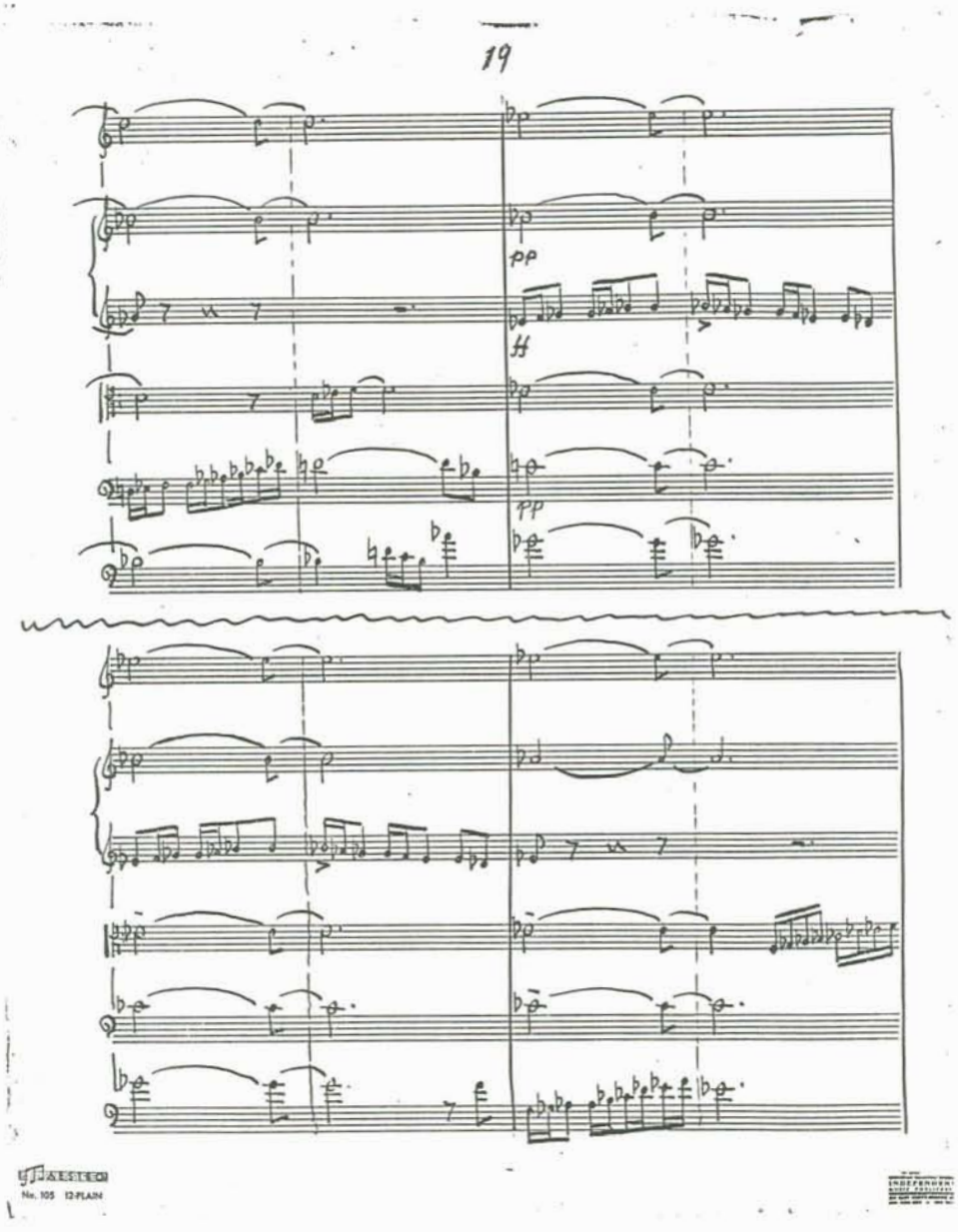


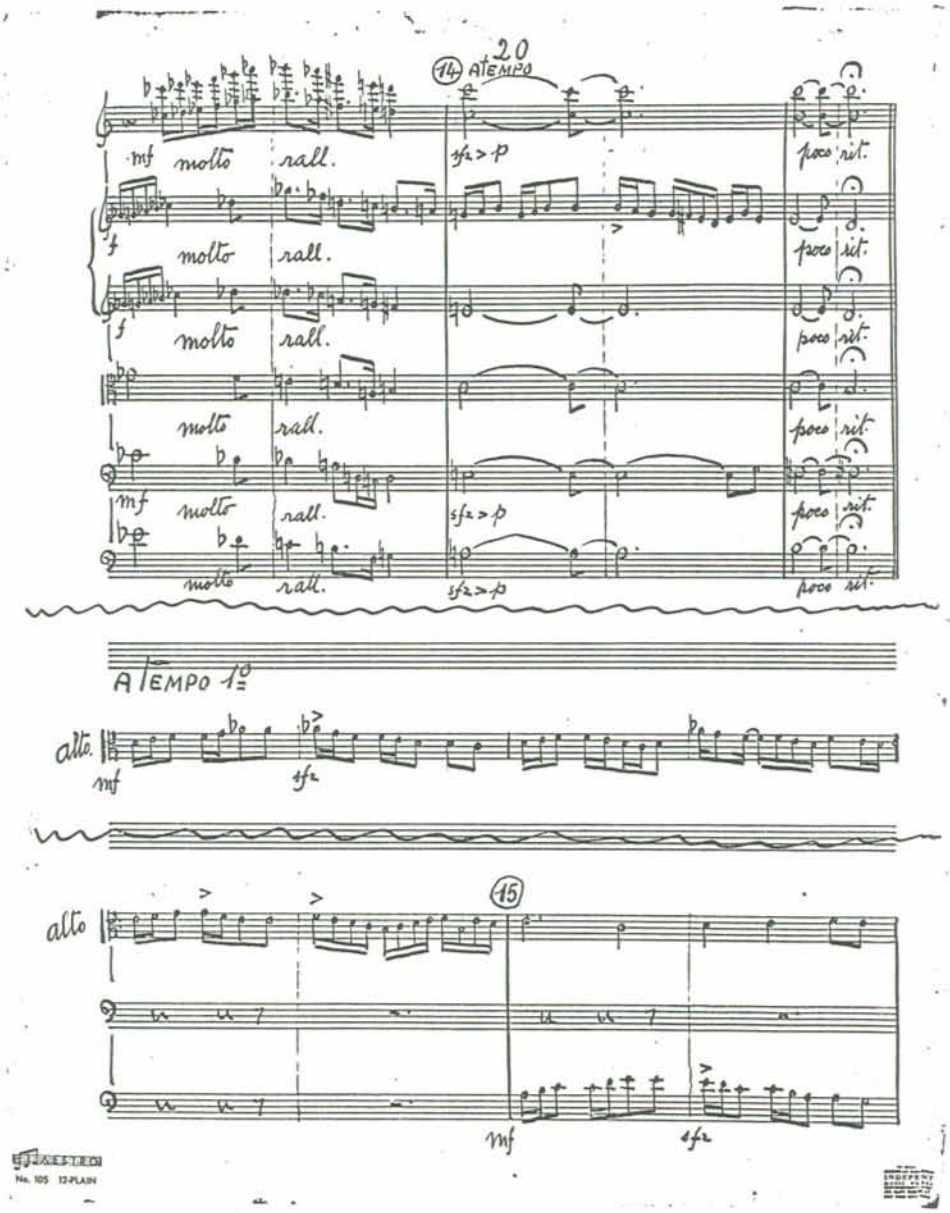


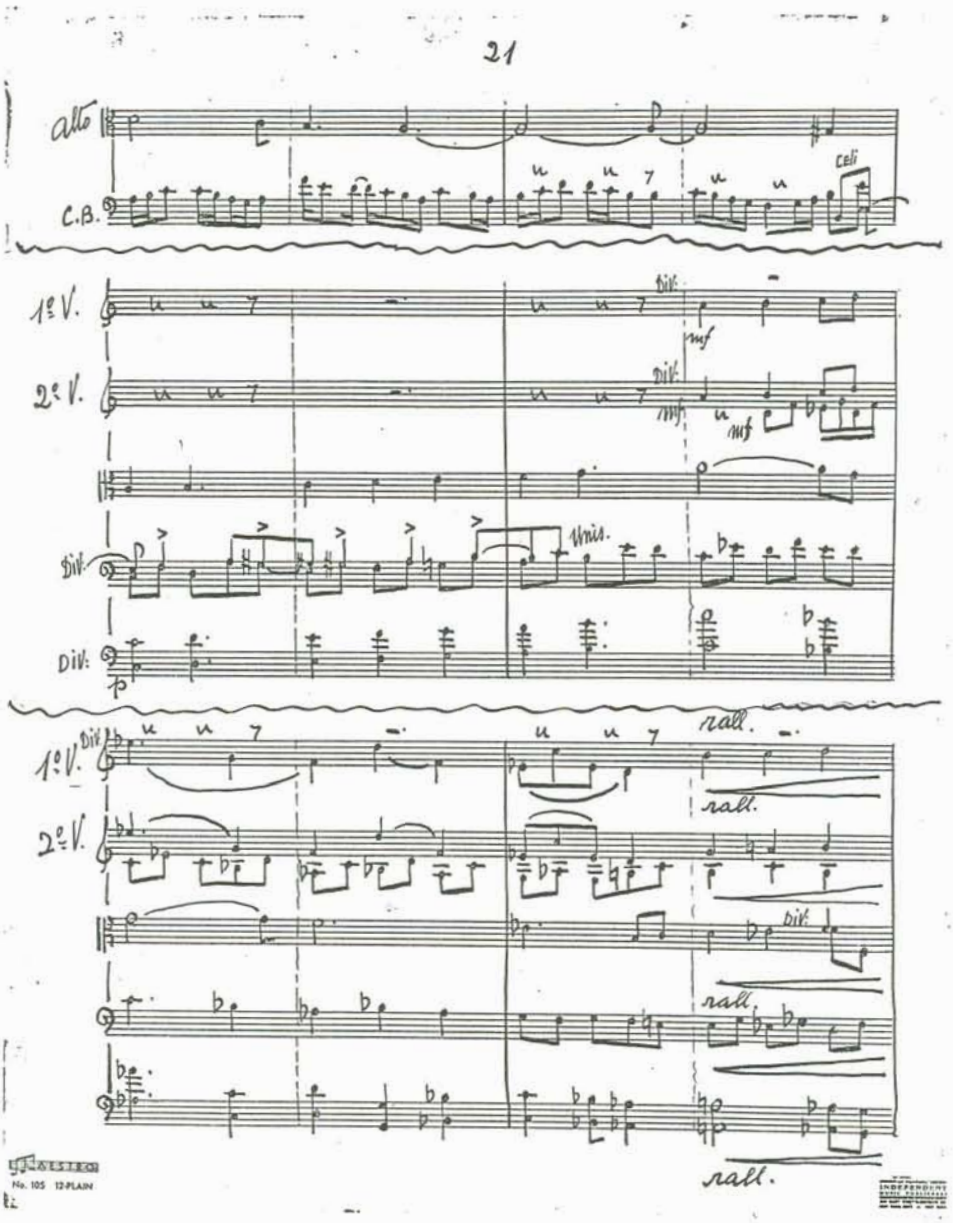












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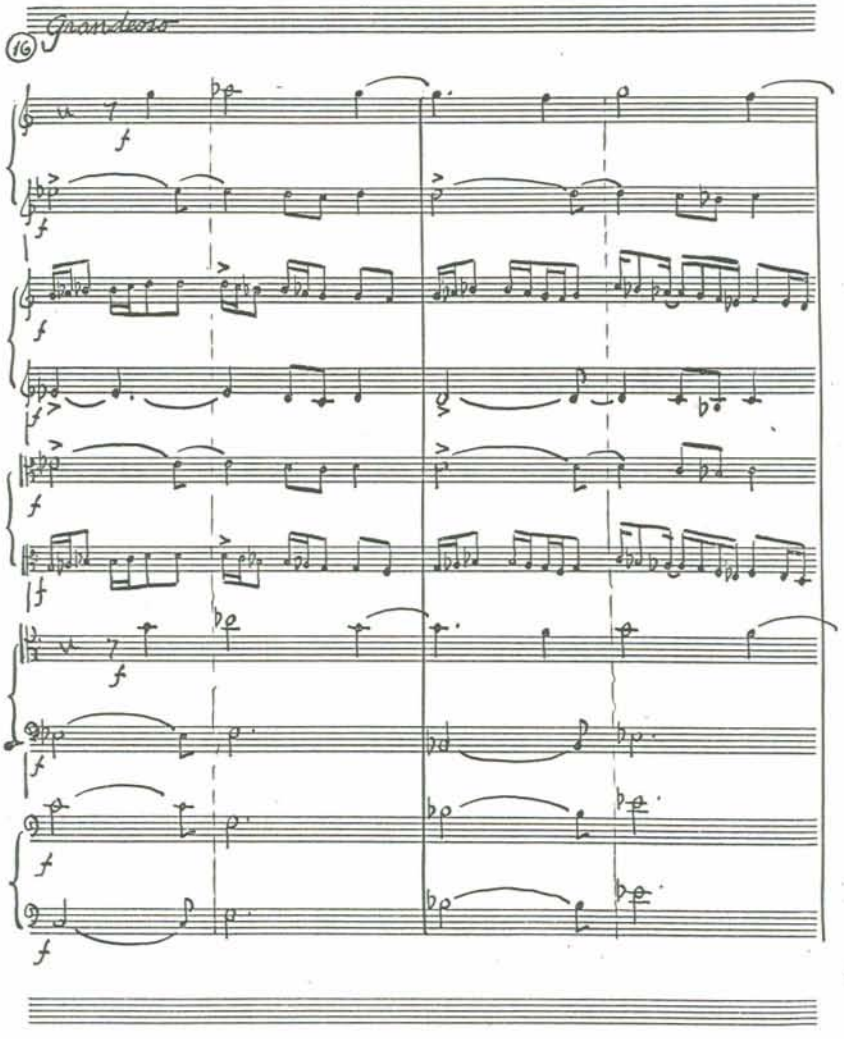
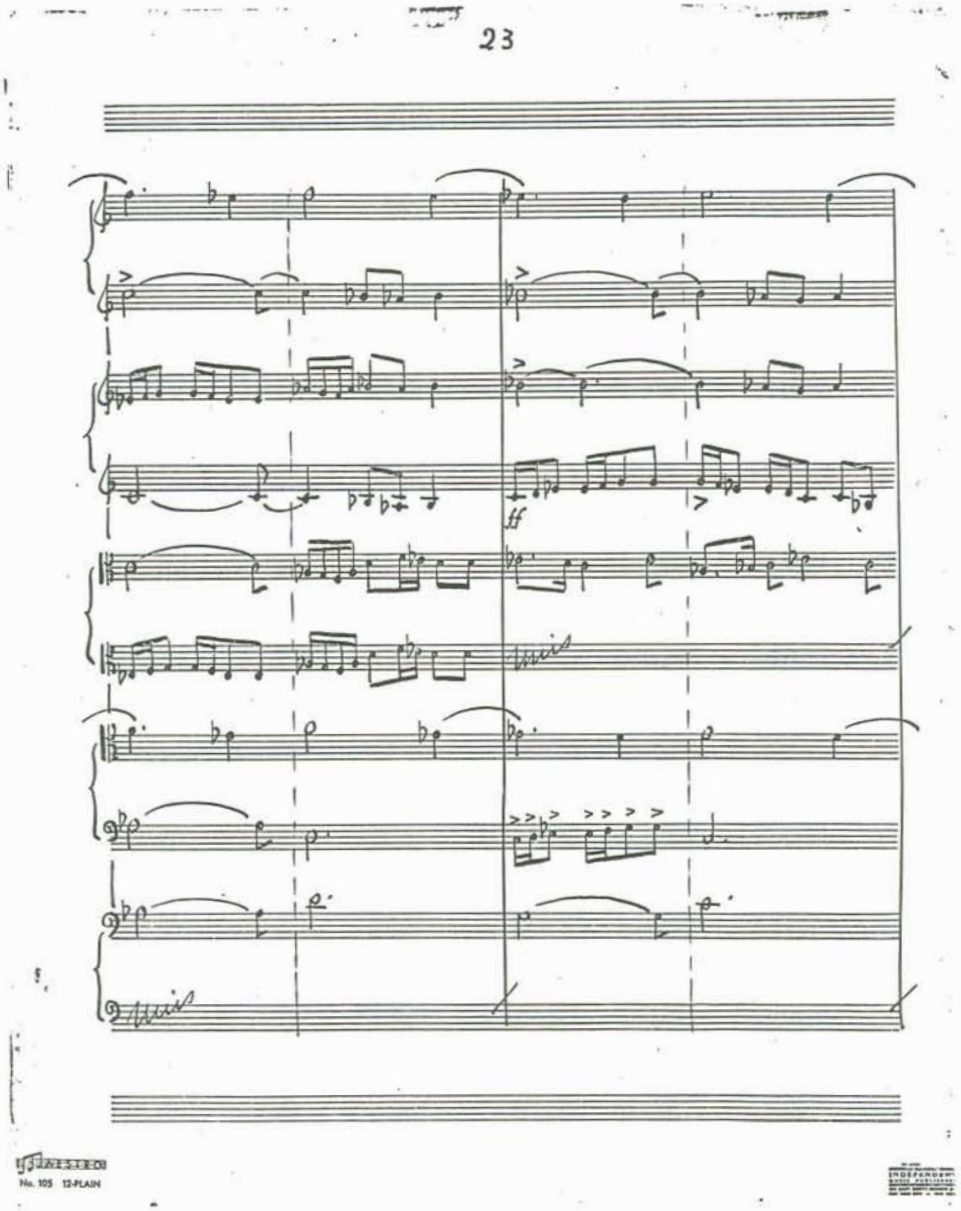
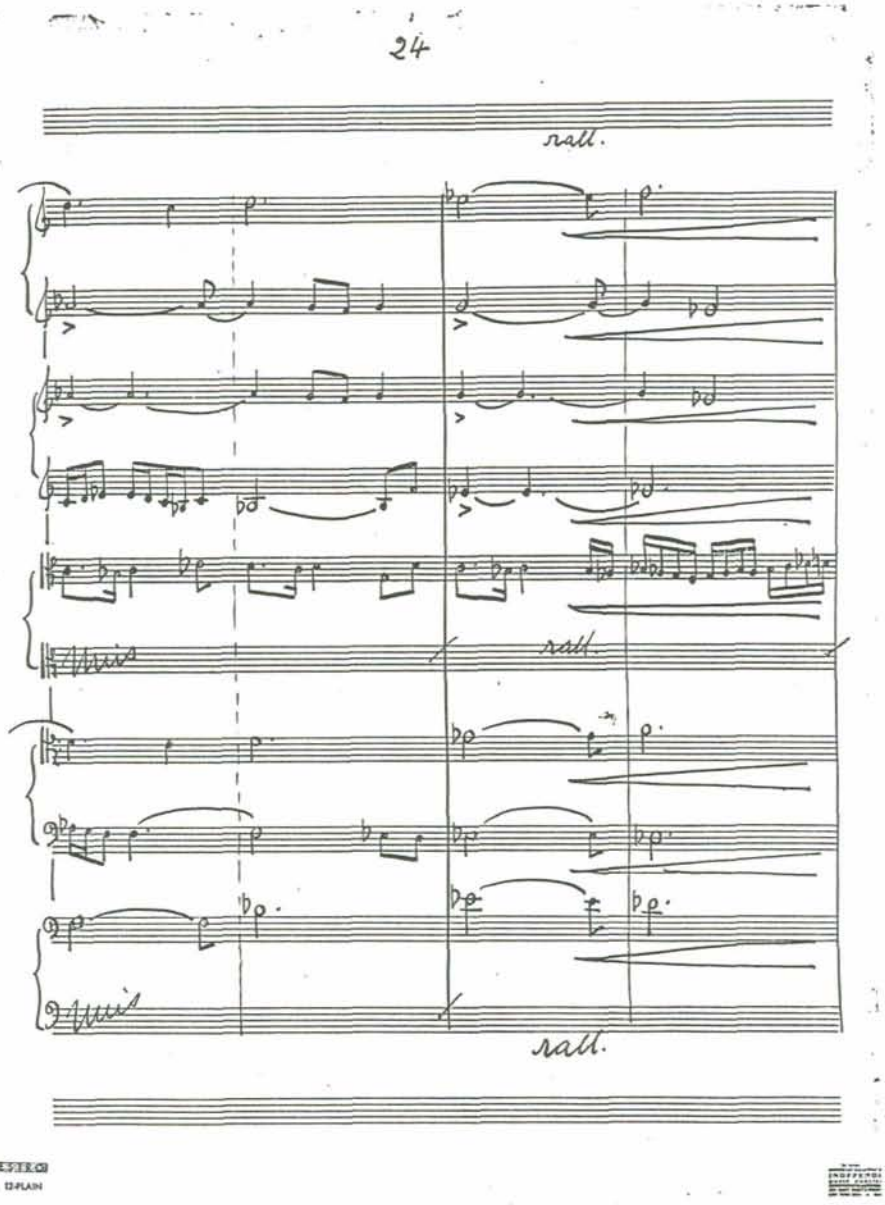
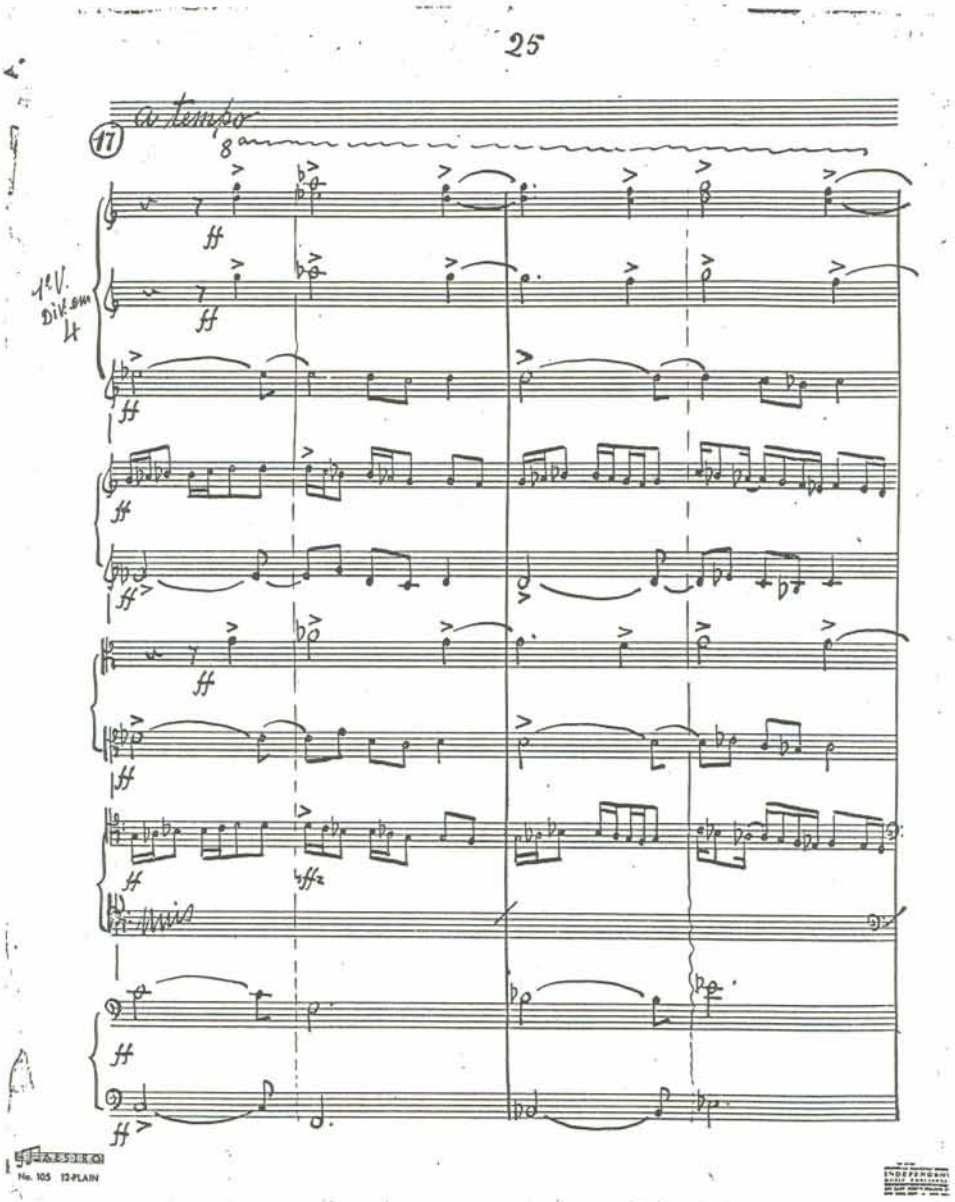
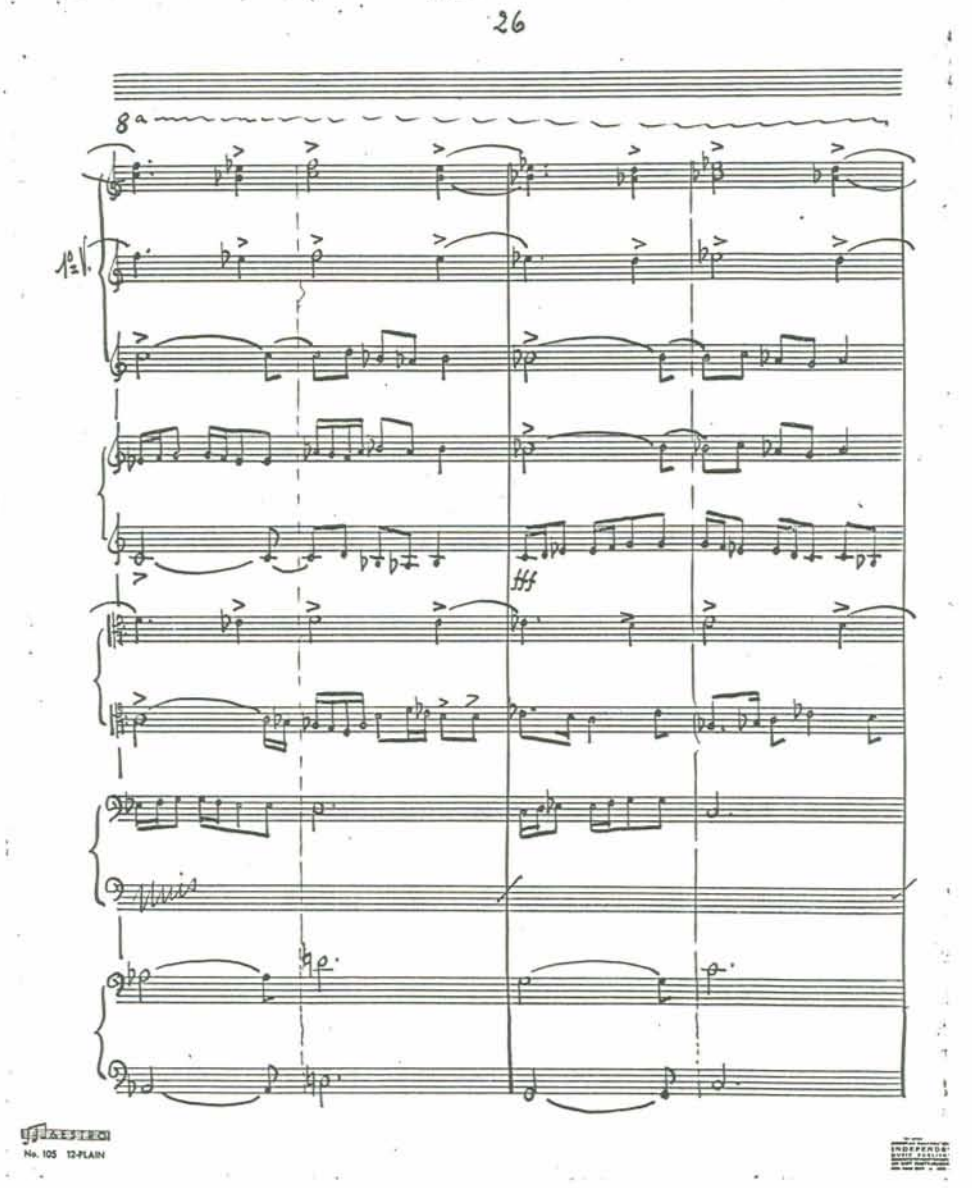
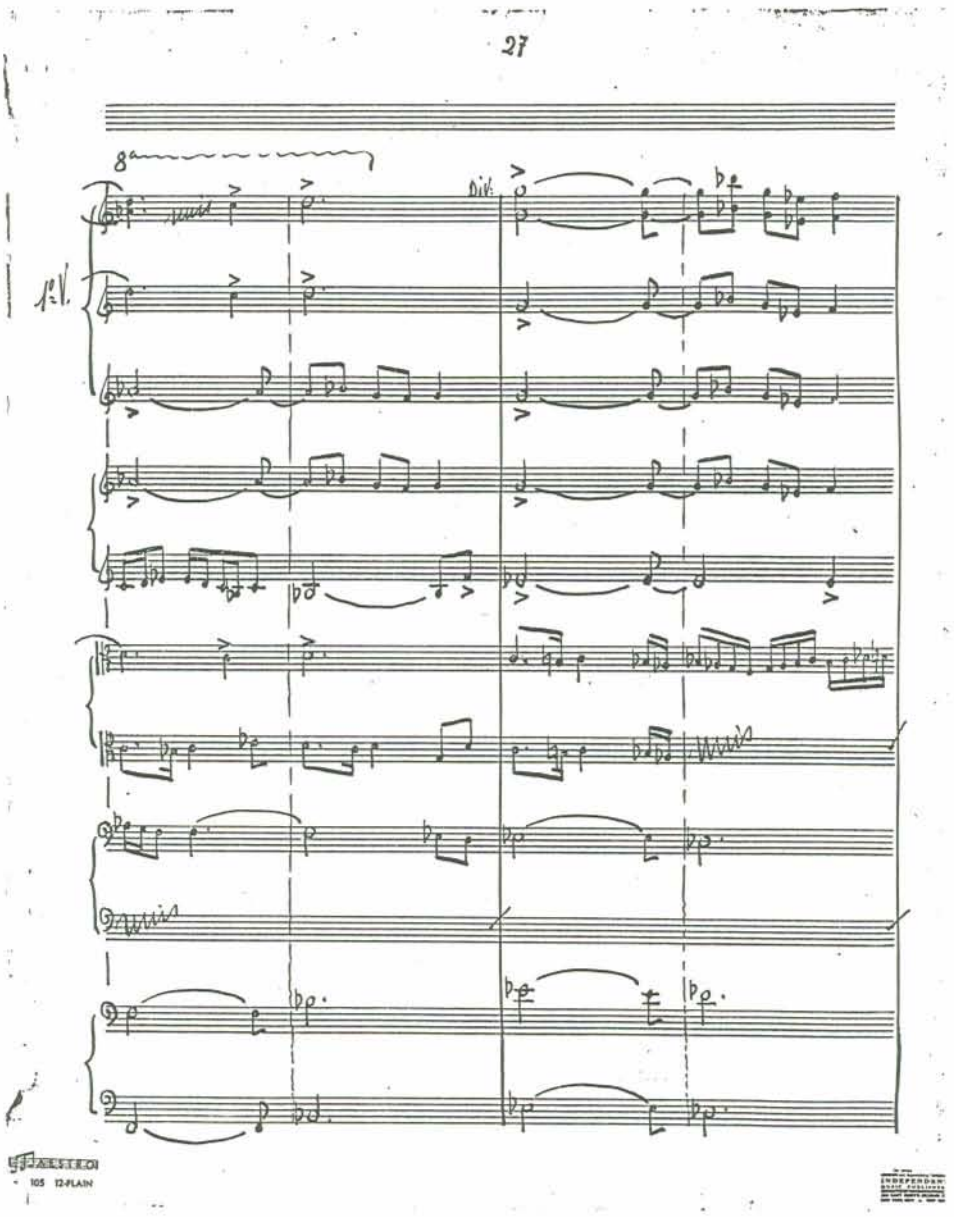


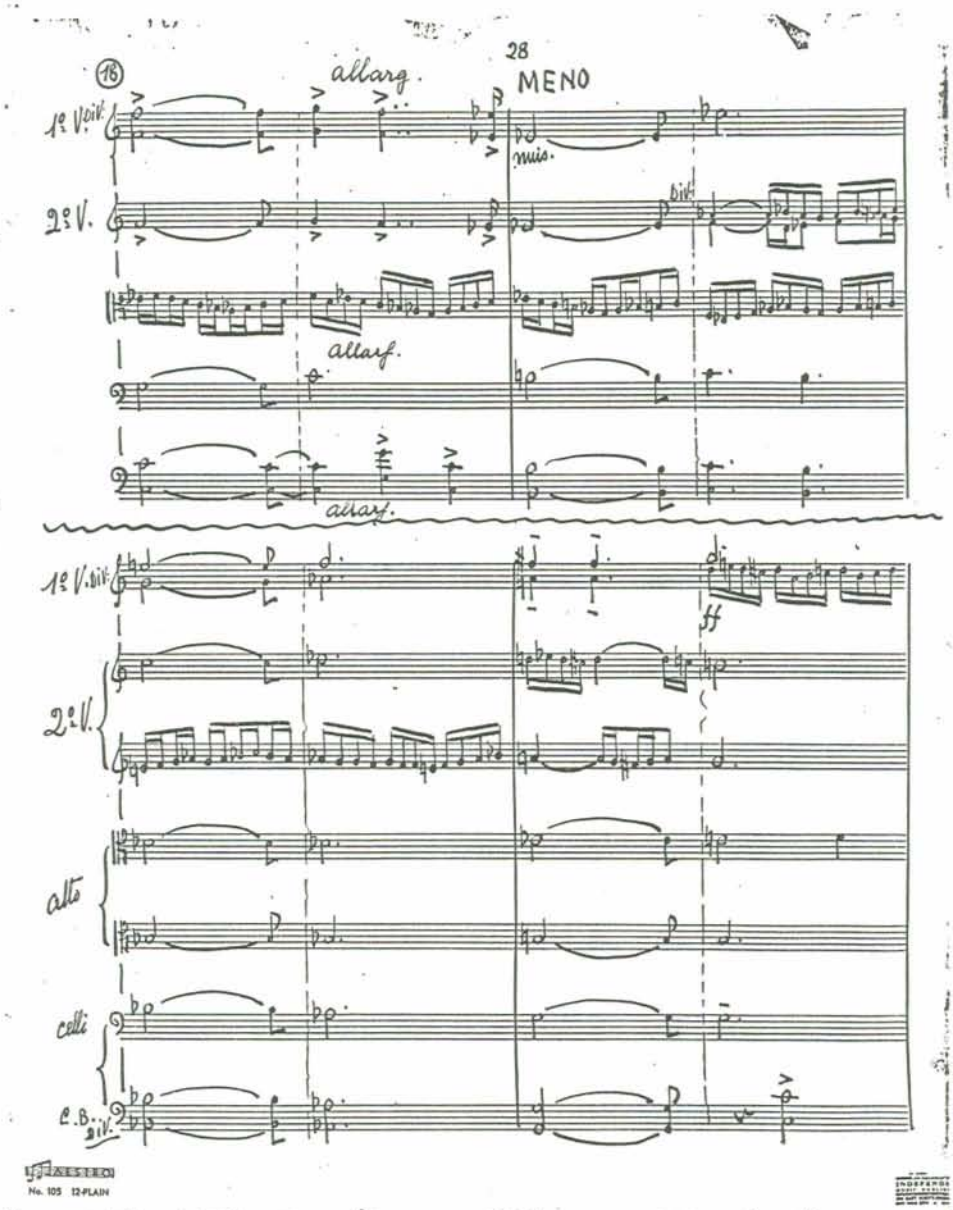




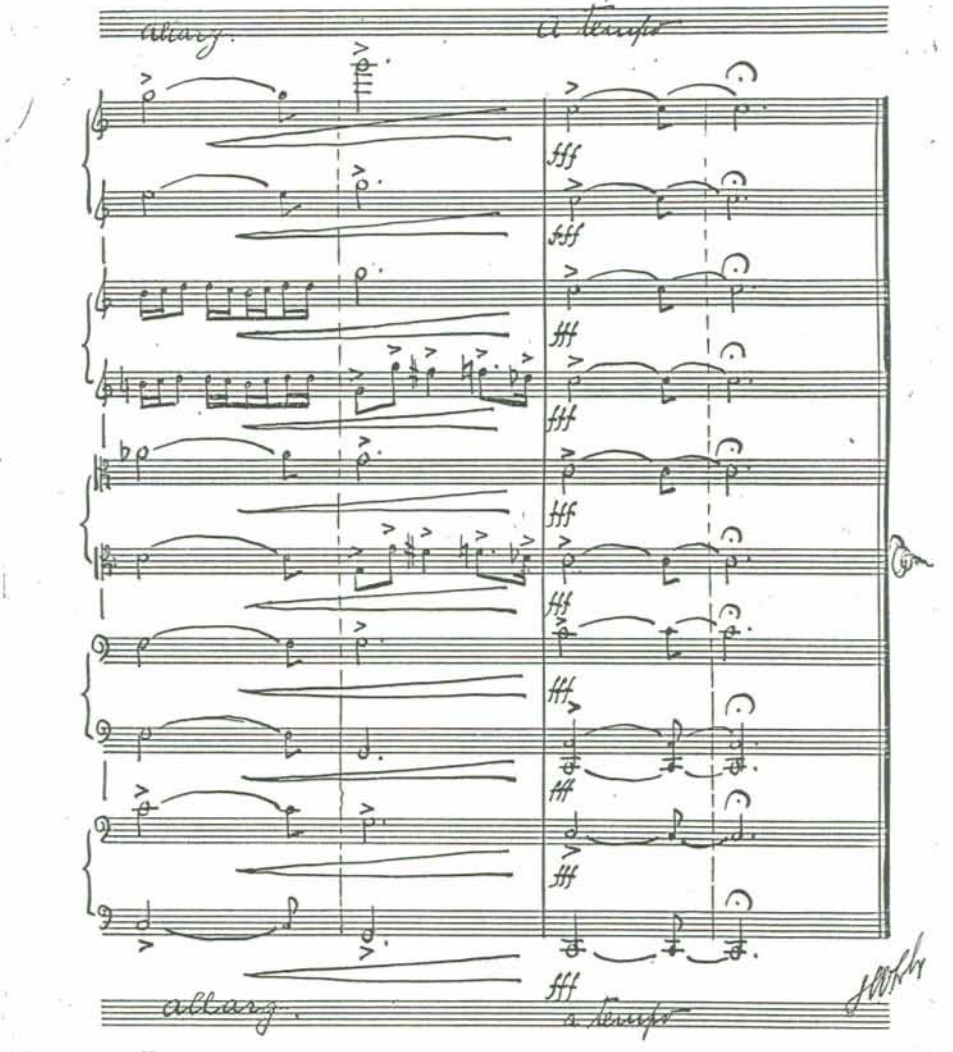






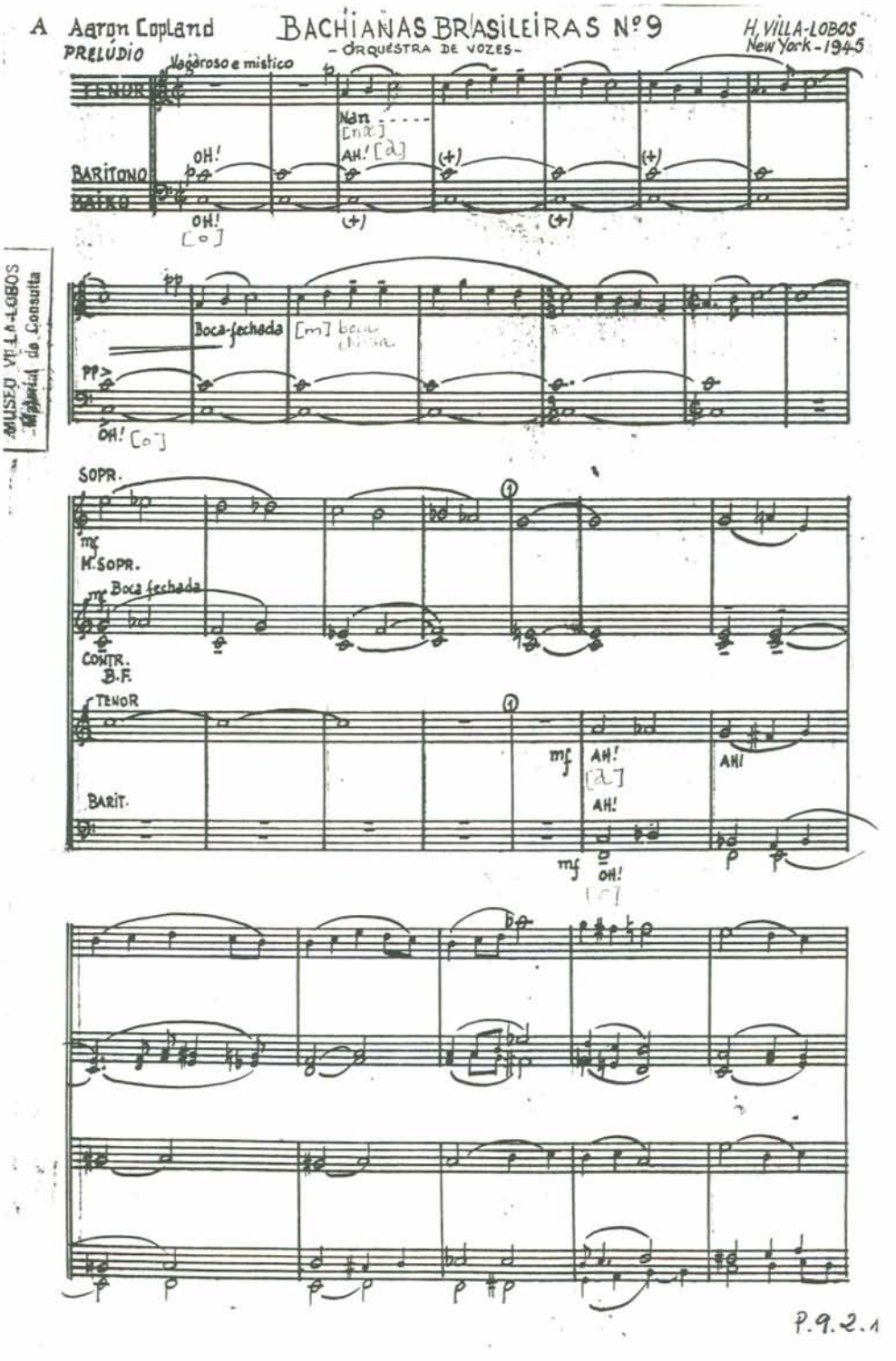


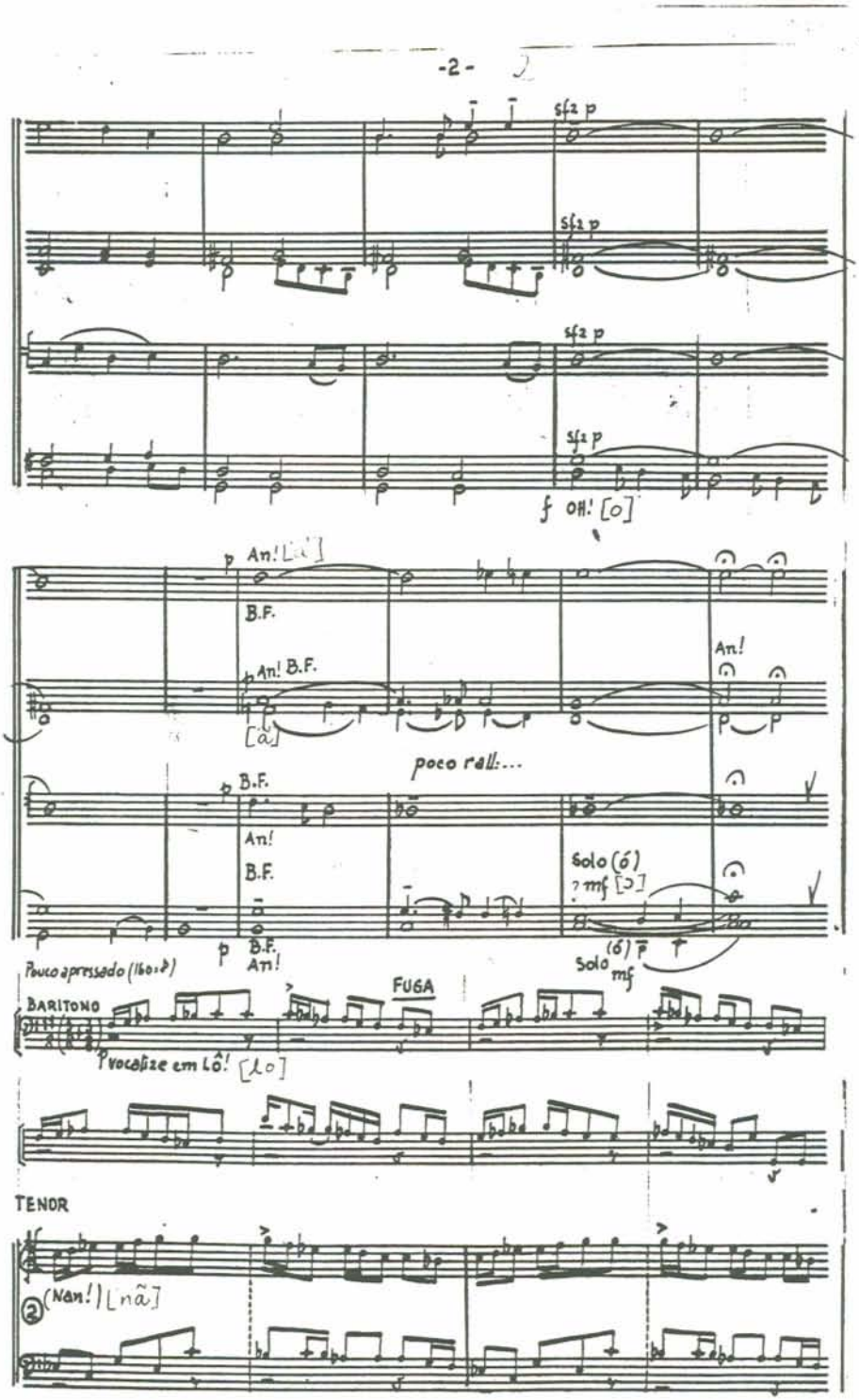
29

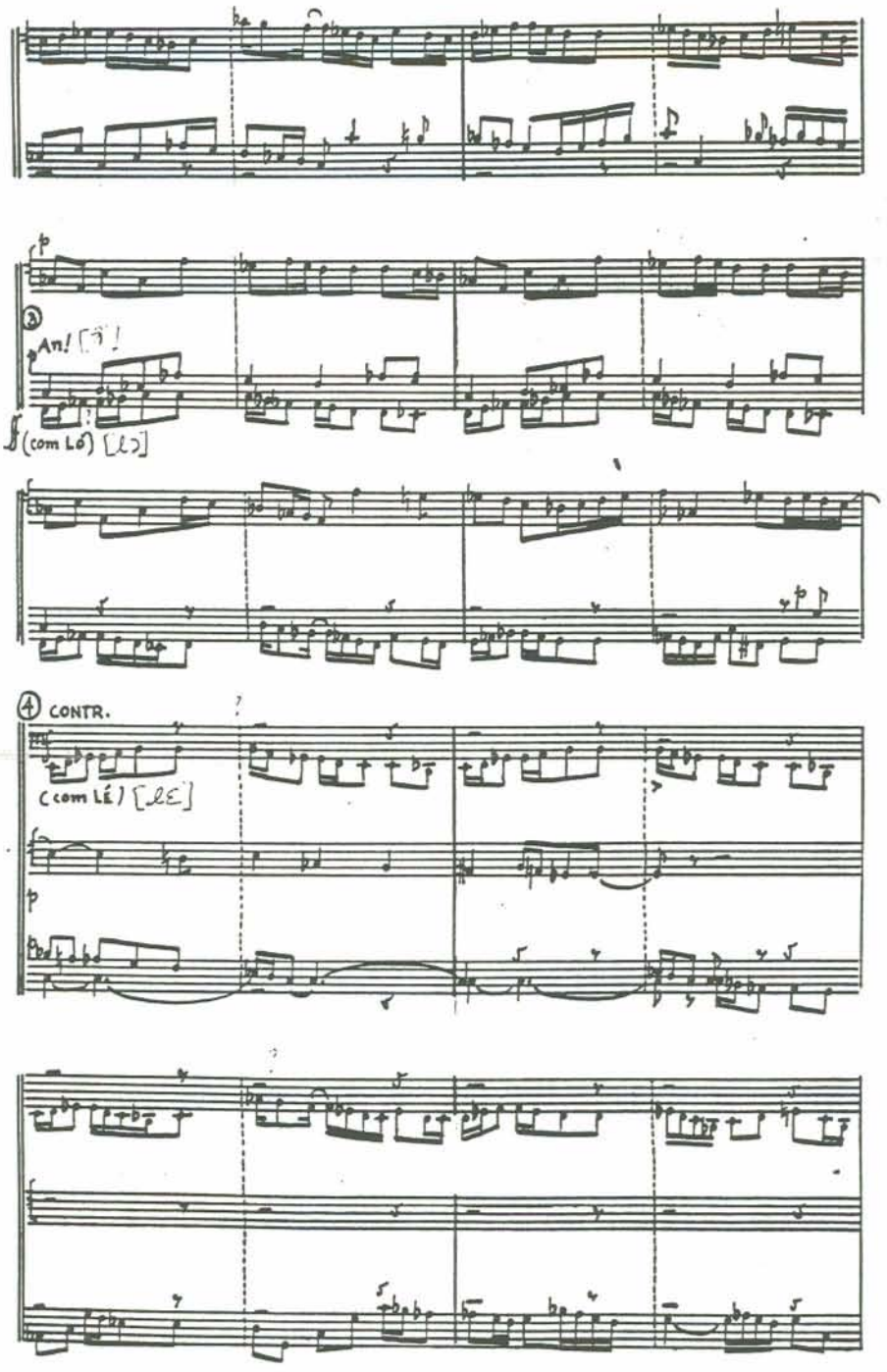


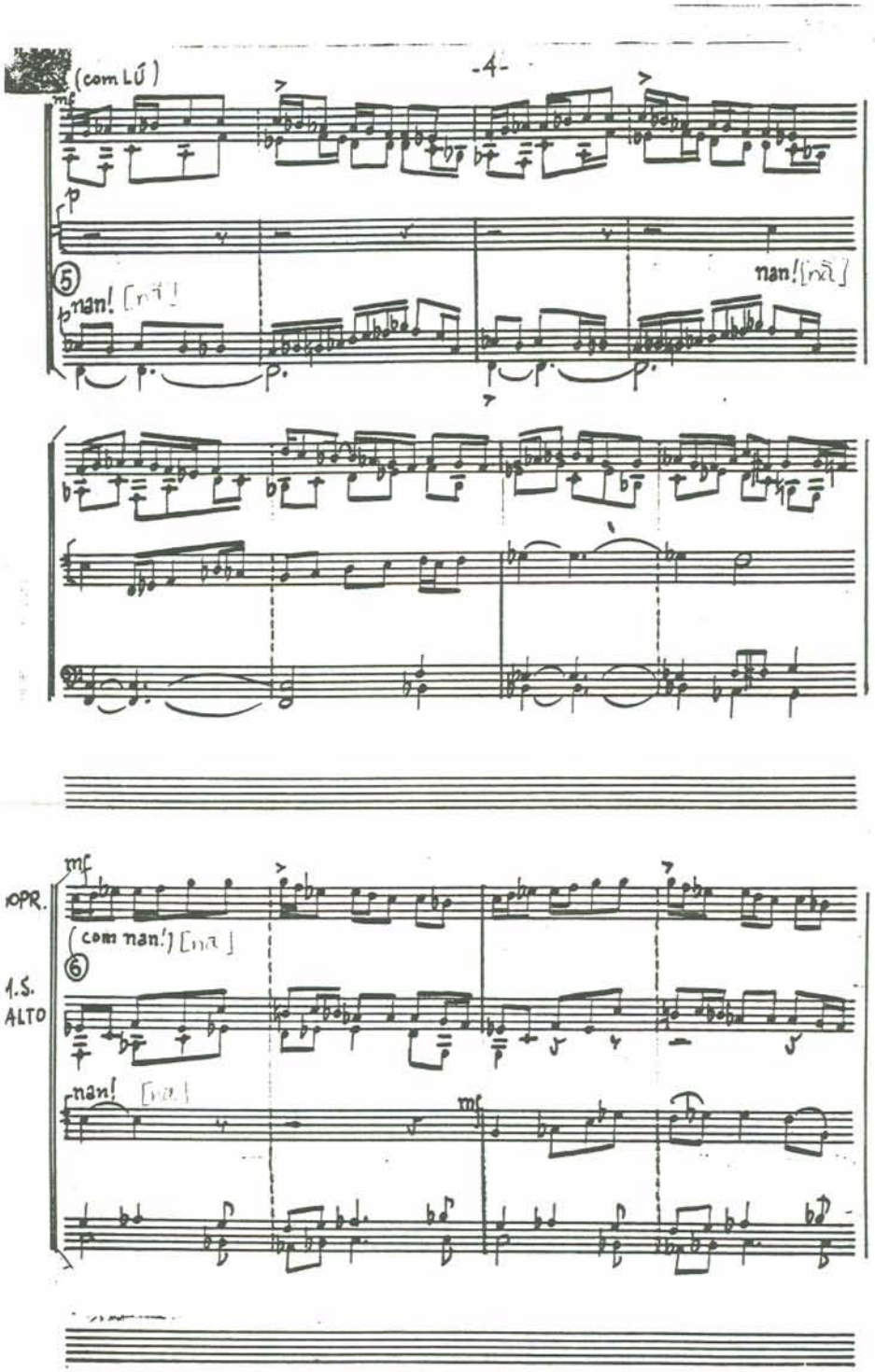
APPENDIX E

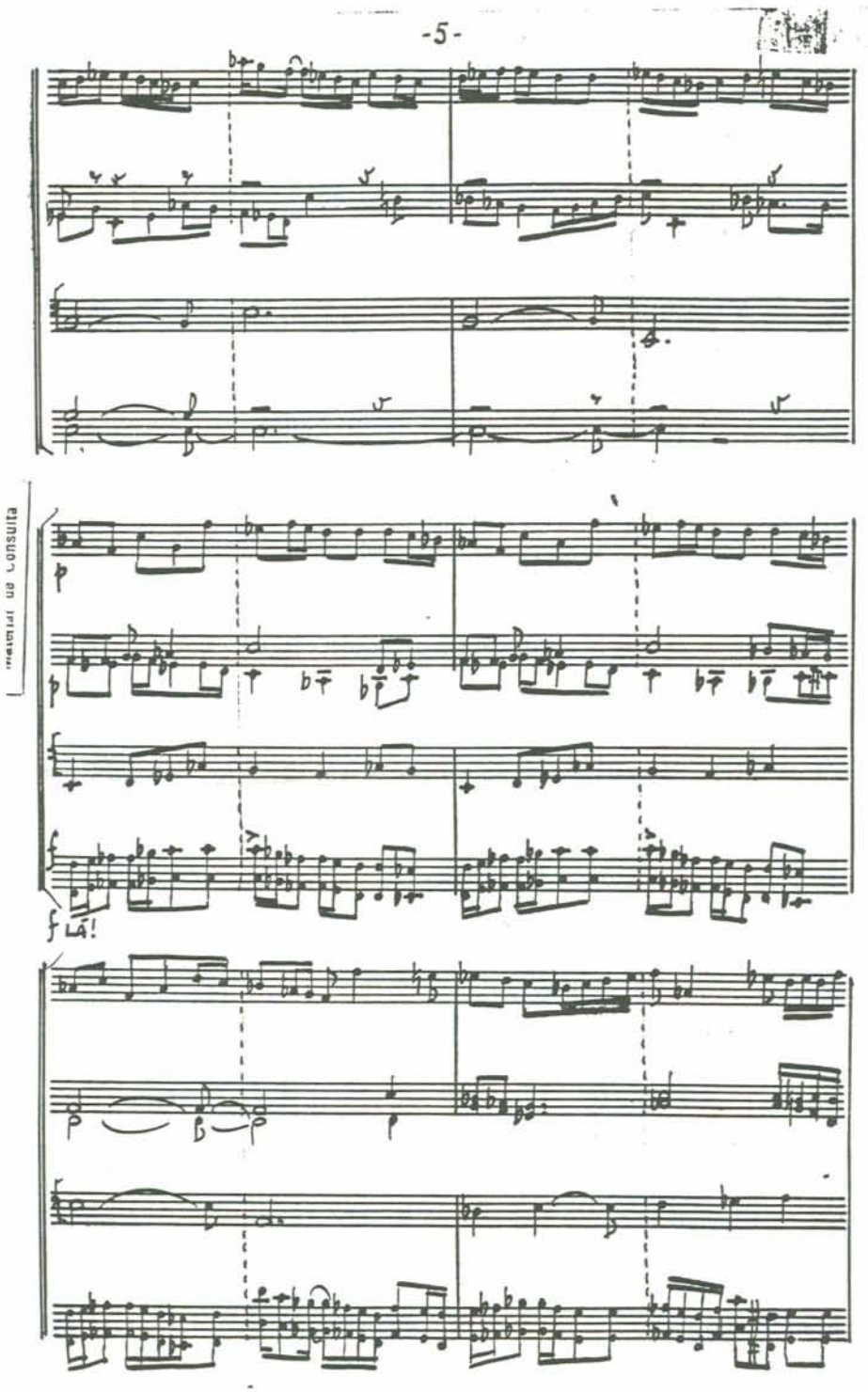
BACHIANAS *BRASILEIRAS NO. 9* VOCAL VERSION COPY BY F. PAES DE OLIVEIRA

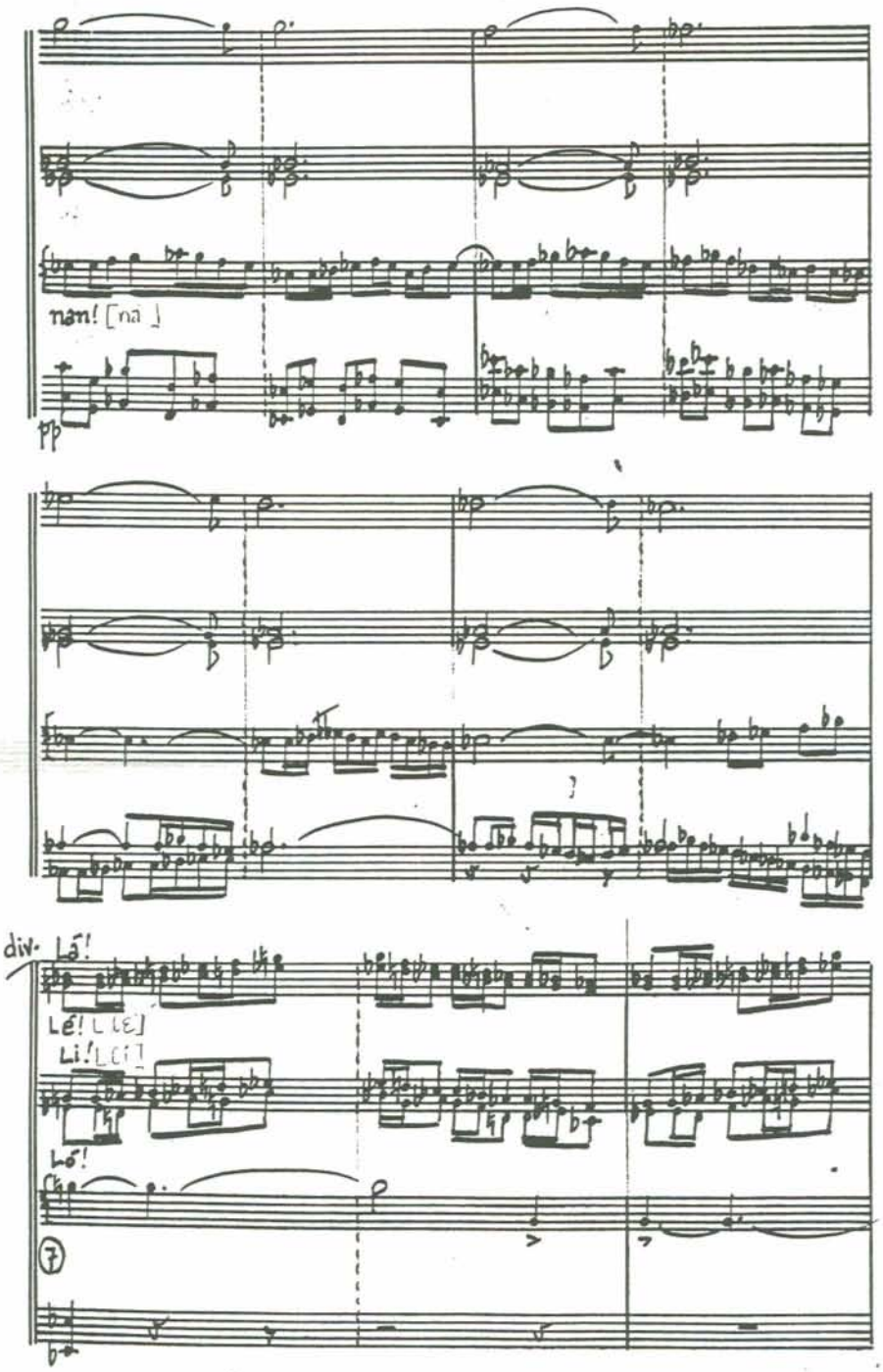

A Aaron Copland
BACHIANAS BRASILEIRAS Nº 9
- ORQUESTRA DE VOZES -
H. VILLA-LOBOS
New York - 1945
PRELUDIO
Vagaroso e mistico
TENOR
BARITONO
Nan
[nã]
AH! [à]
OH!
[o]
Boca fechada
[m]
SOPR.
M. SOPR.
CONTR.
B.F.
TENOR
BARIT.
AH!
MUSEU VILLA-LOBOS
Material de Consulta
P.9.2.1

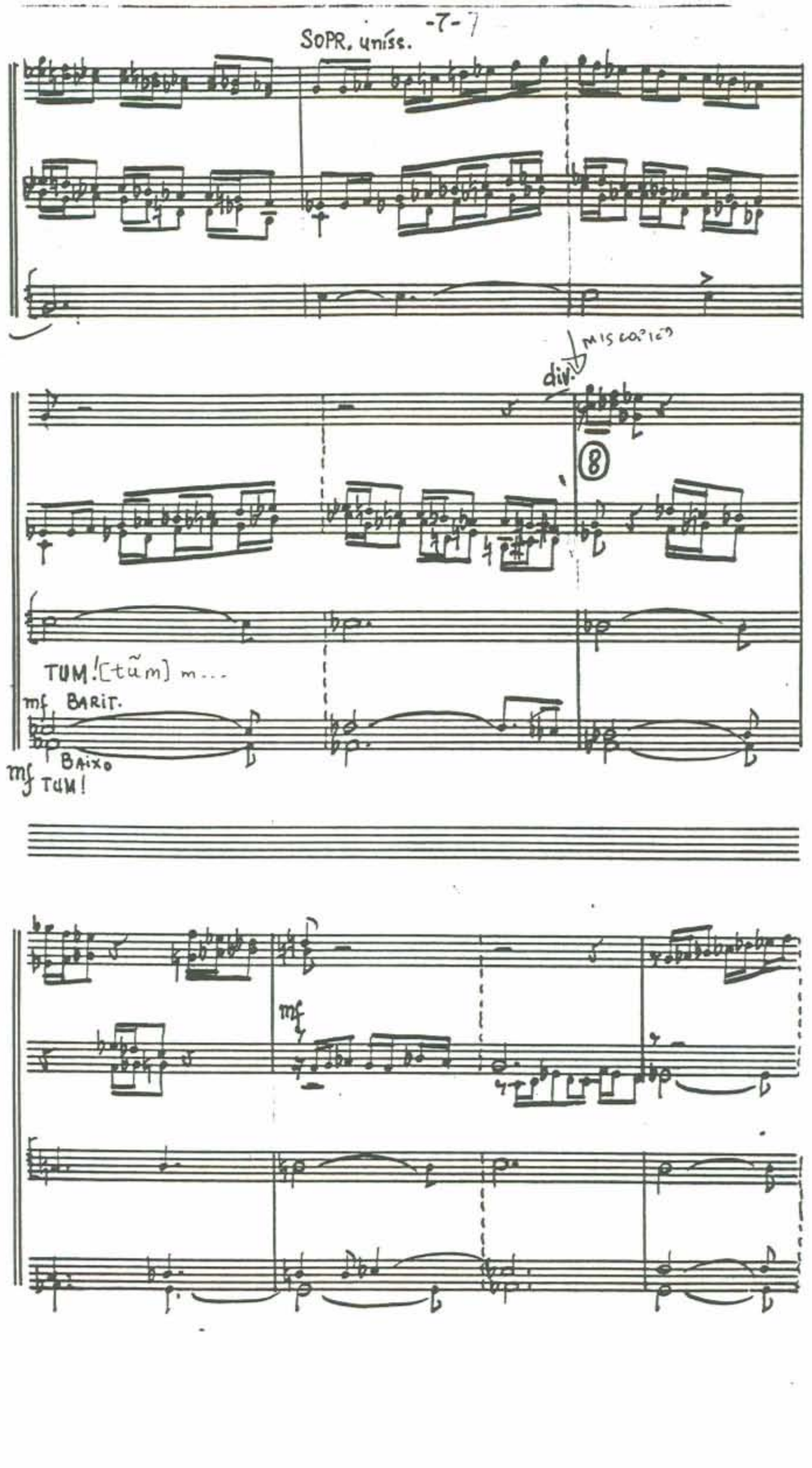

-2-
sfz p
sfz p
sfz p
sfz p
f OH! [o]
p An! [ã]
B.F.
An! B.F.
[ã]
An!
poco rall:...
B.F.
An!
B.F.
Solo (ó)
mf [ɔ]
p B.F. An!
Solo (ó) mf
Pouco apressado (160 ♪)
BARITONO
FUGA
Vocalize em LÔ! [lo]
TENOR
(Nan!) [nã]

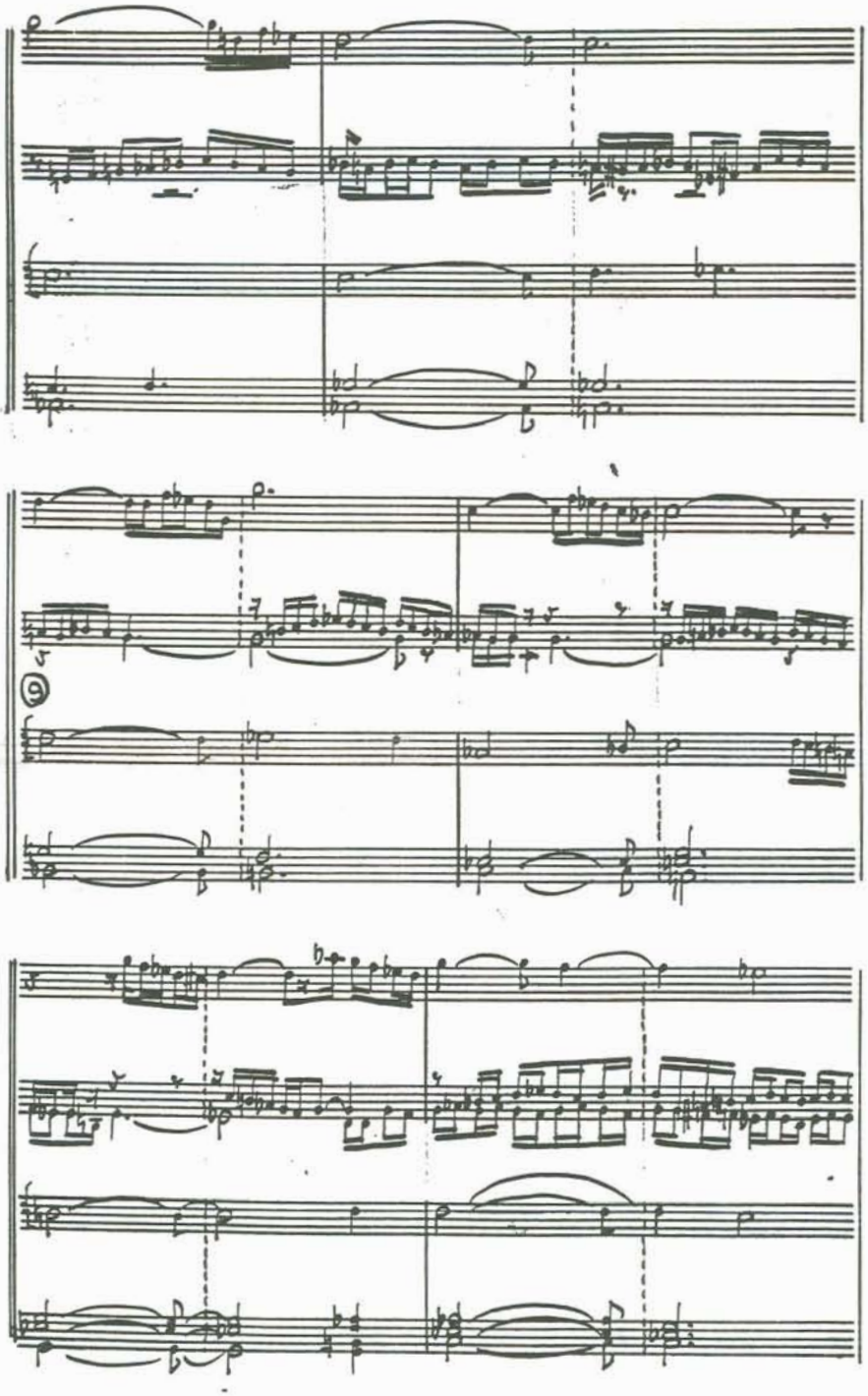

③
An! [ɐ̃!]
(com Ló) [lɔ]
④ CONTR.
(com LÉ) [lɛ]

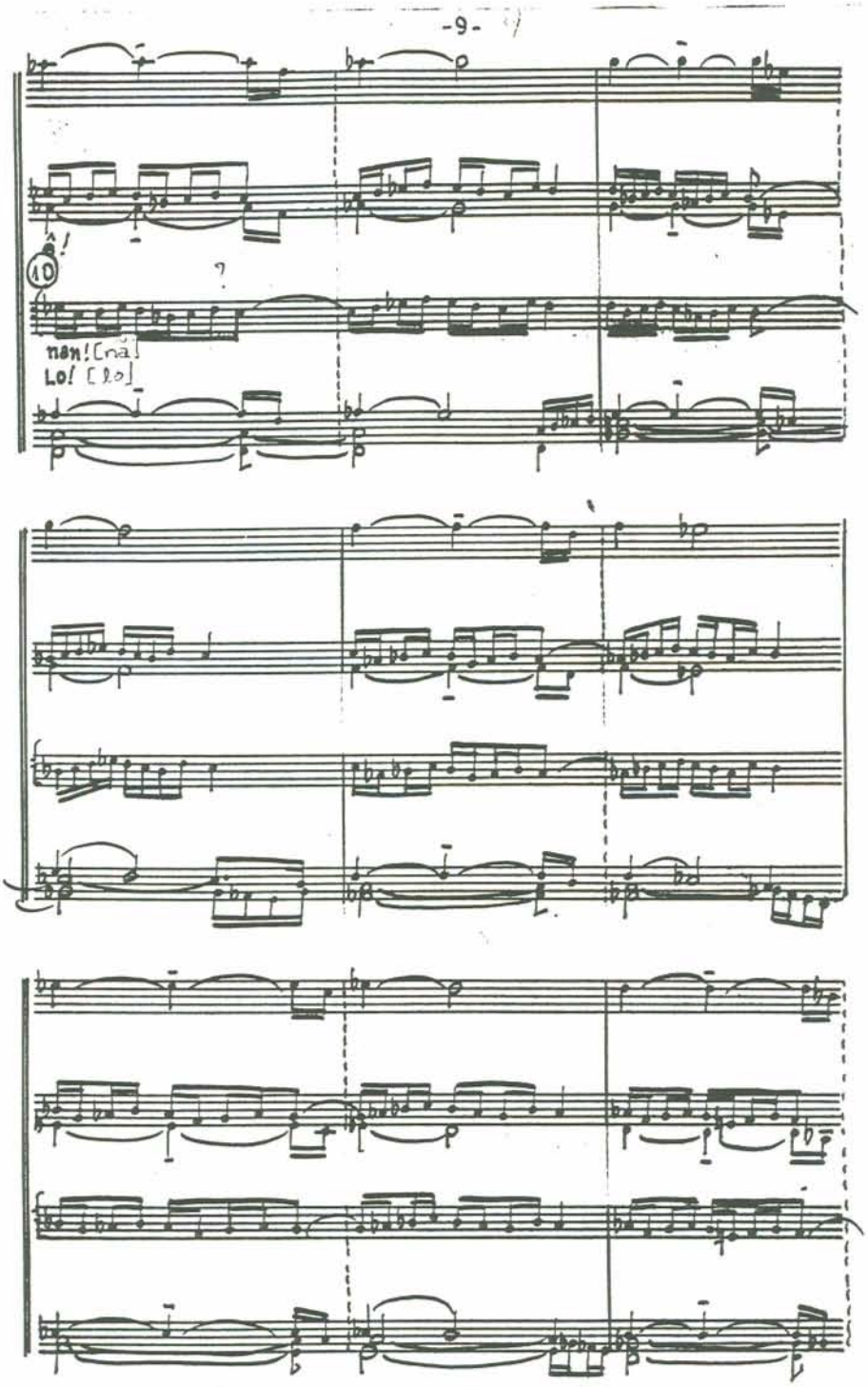

-4-
(com LÚ)
mf
p
⑤
nan! [nã]
nan! [nã]
mf
1OPR.
(com nan!) [na]
⑥
1.S.
ALTO
nan! [na]
mf

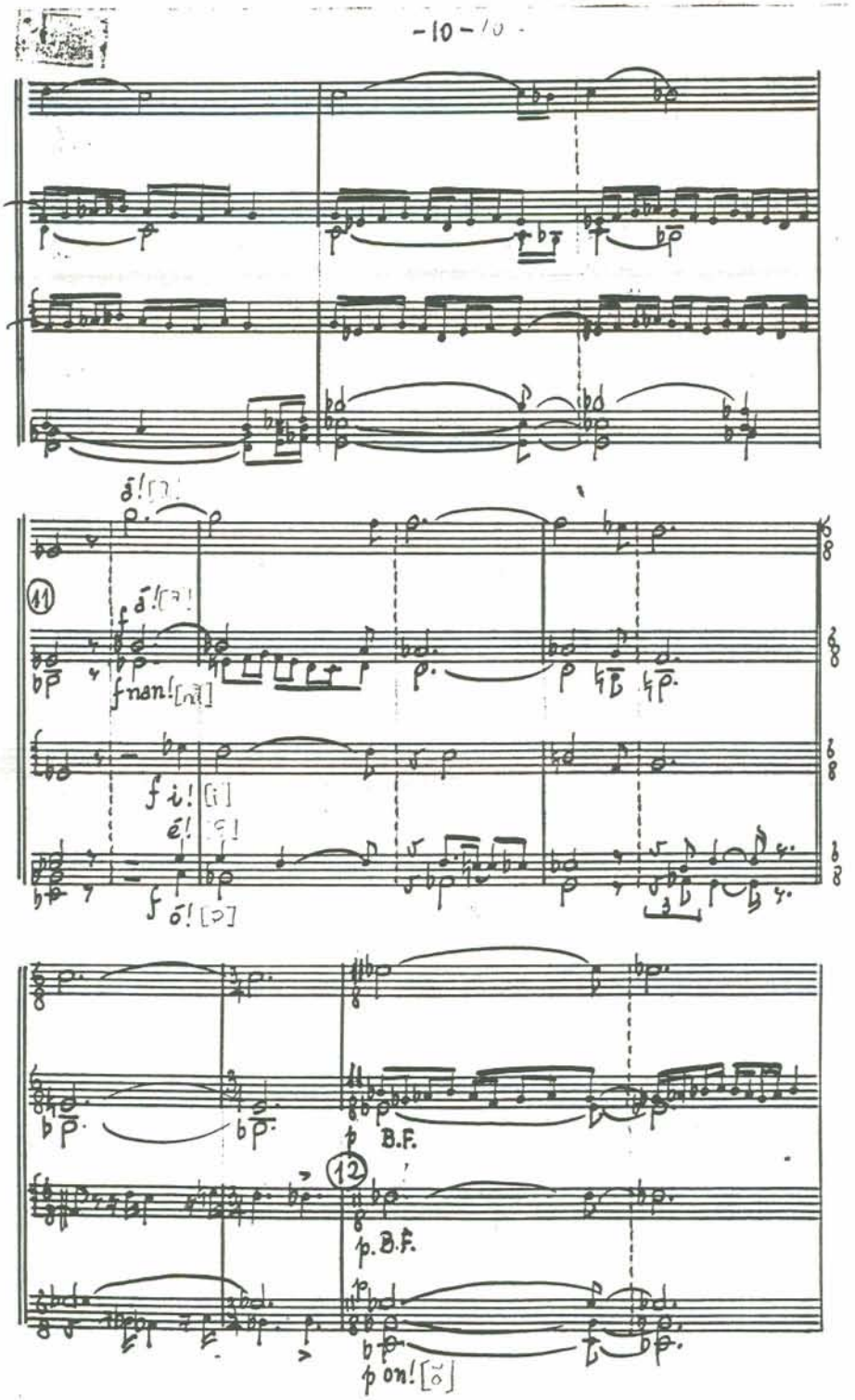

-5-
Lá!

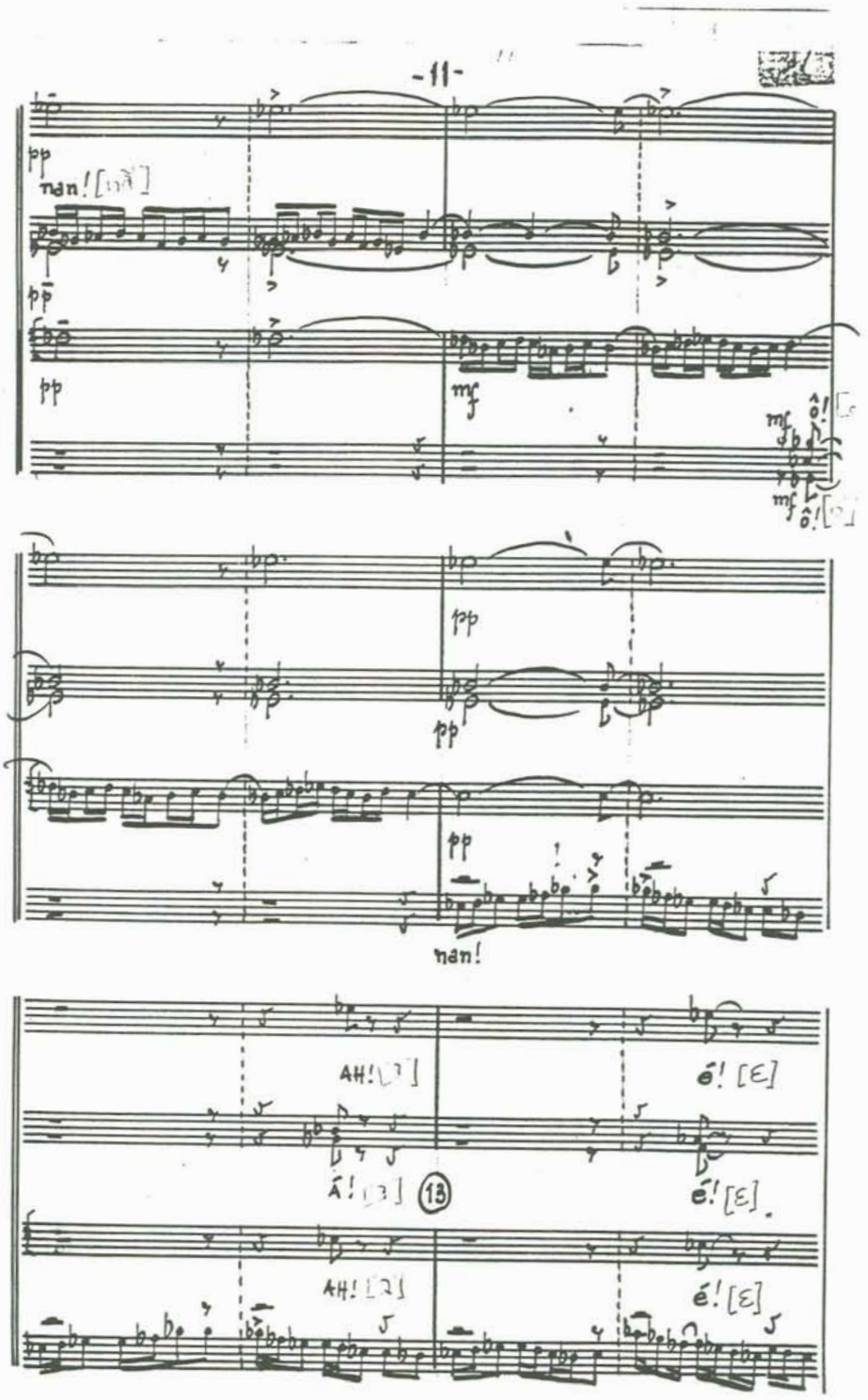

nən! [nə̃]
pp
div. Lə̃!
Lé! [lɛ]
Li! [li]
Ló!
7


-7-
SOPR. uníss.
div.
TUM! [tũm] m...
mf BARIT.
BAIXO
mf TUM!
mf

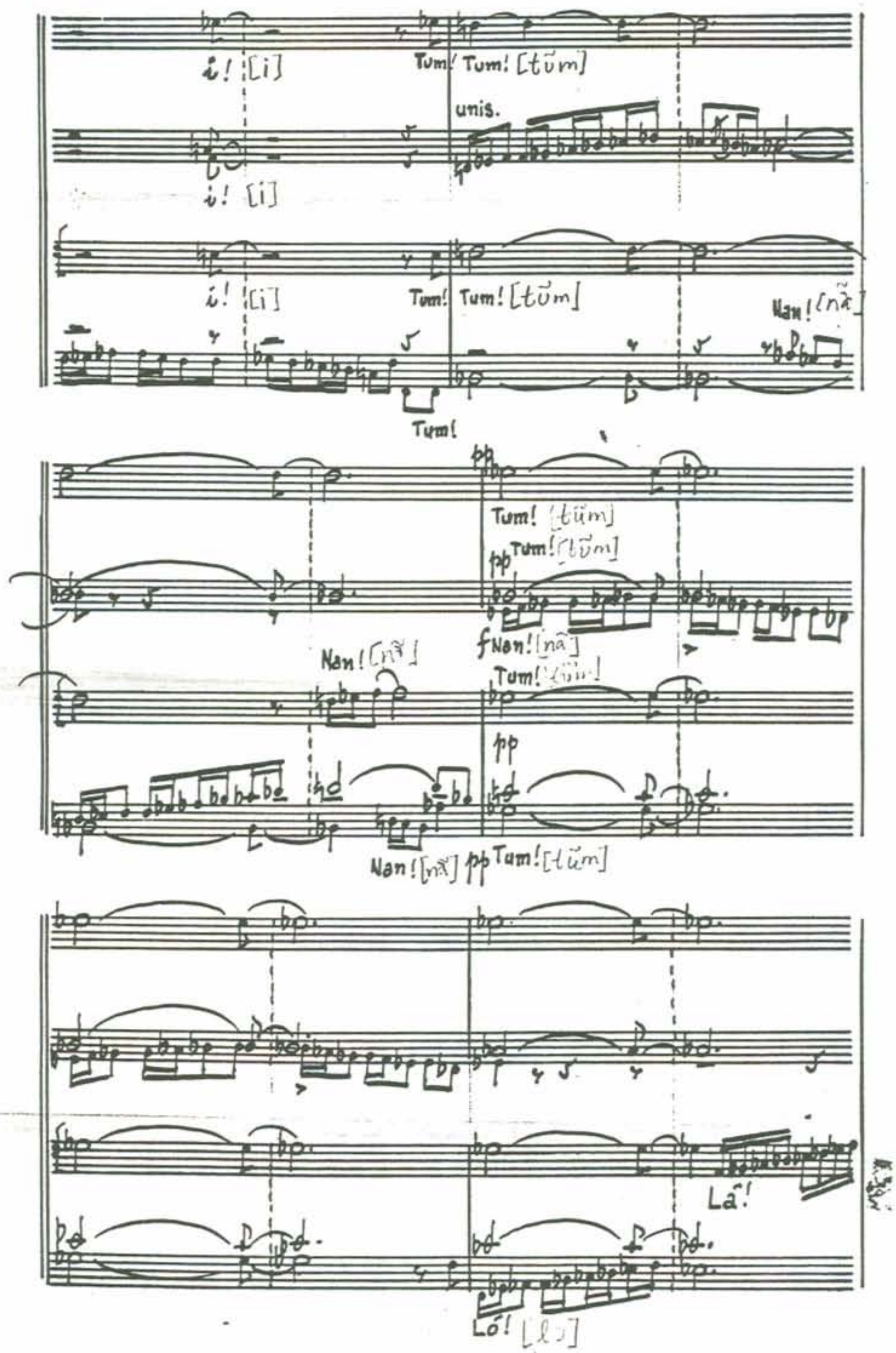


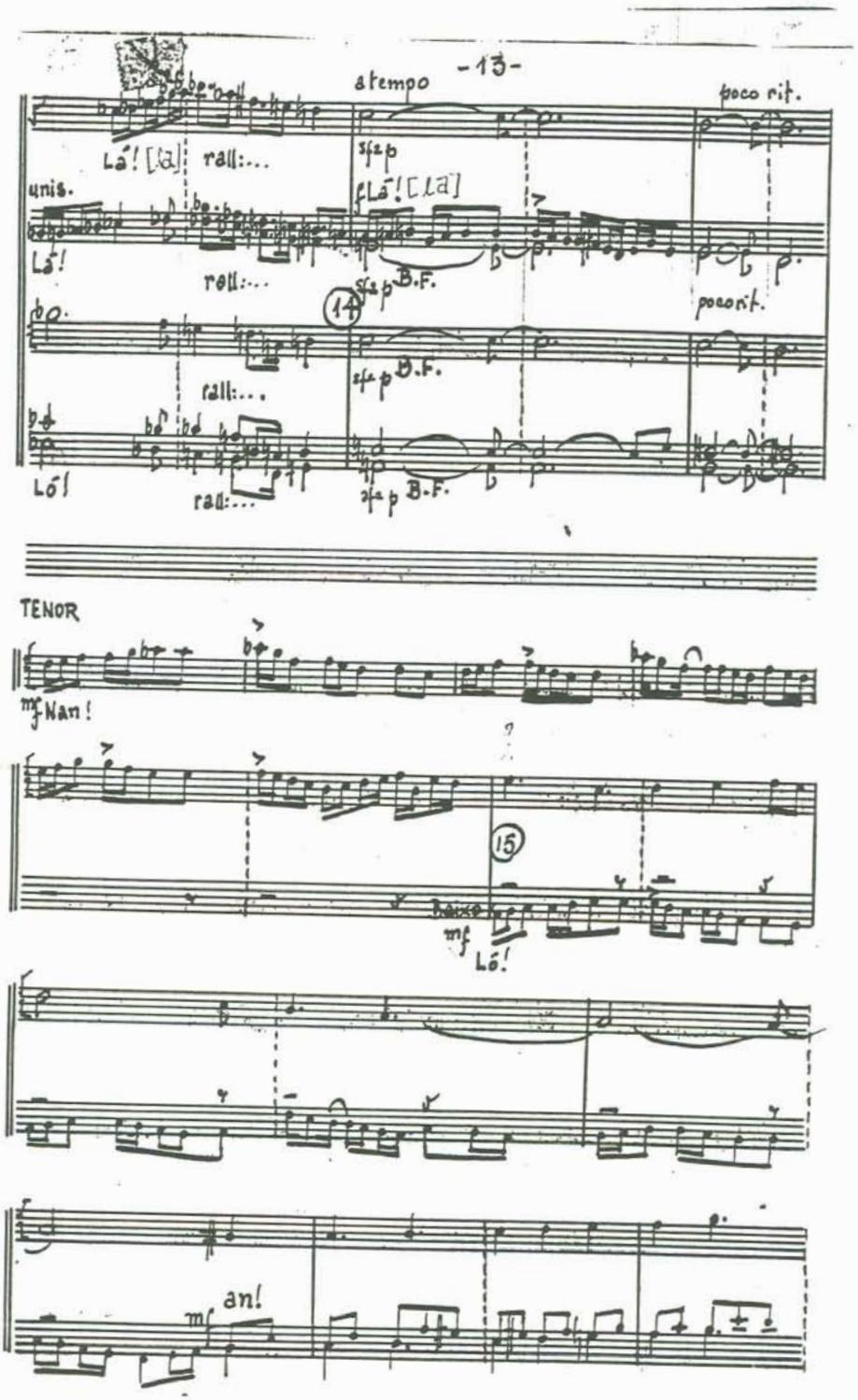

-9-
10
nan! [nà]
Lo! [lo]

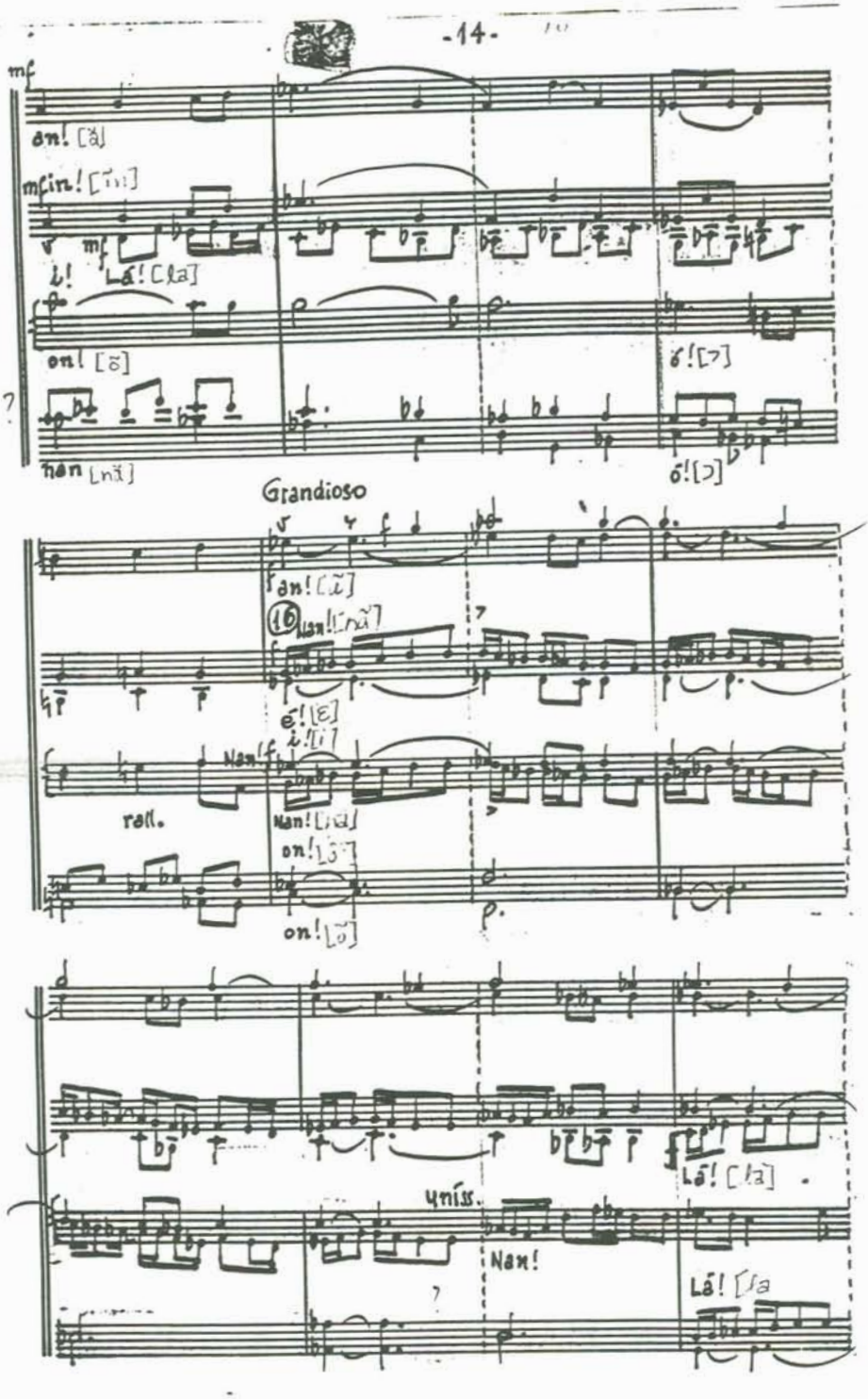

-10-
11
12
B.F.
p. B.F.

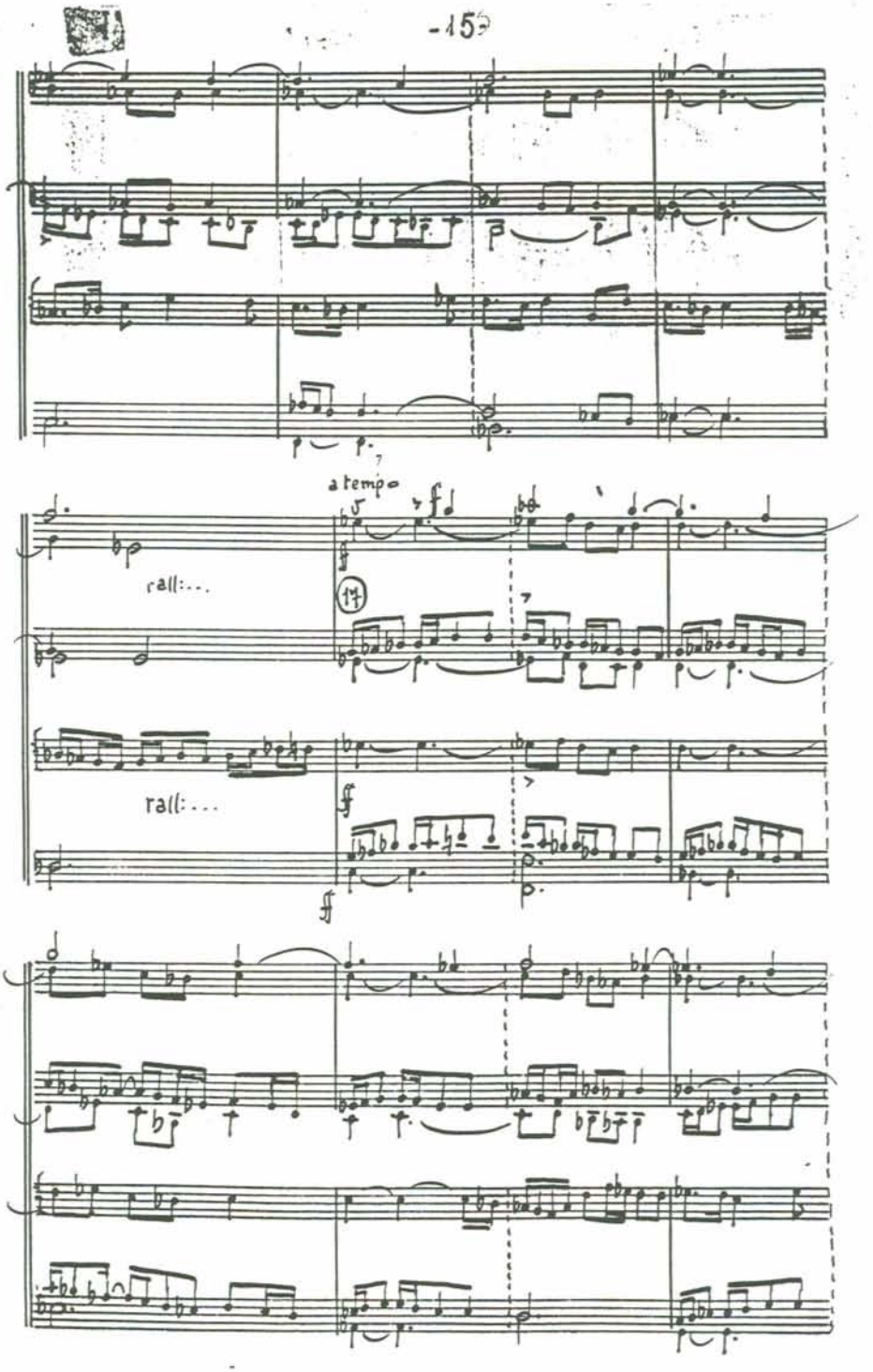

-11-
nan!
AH!
é!
13

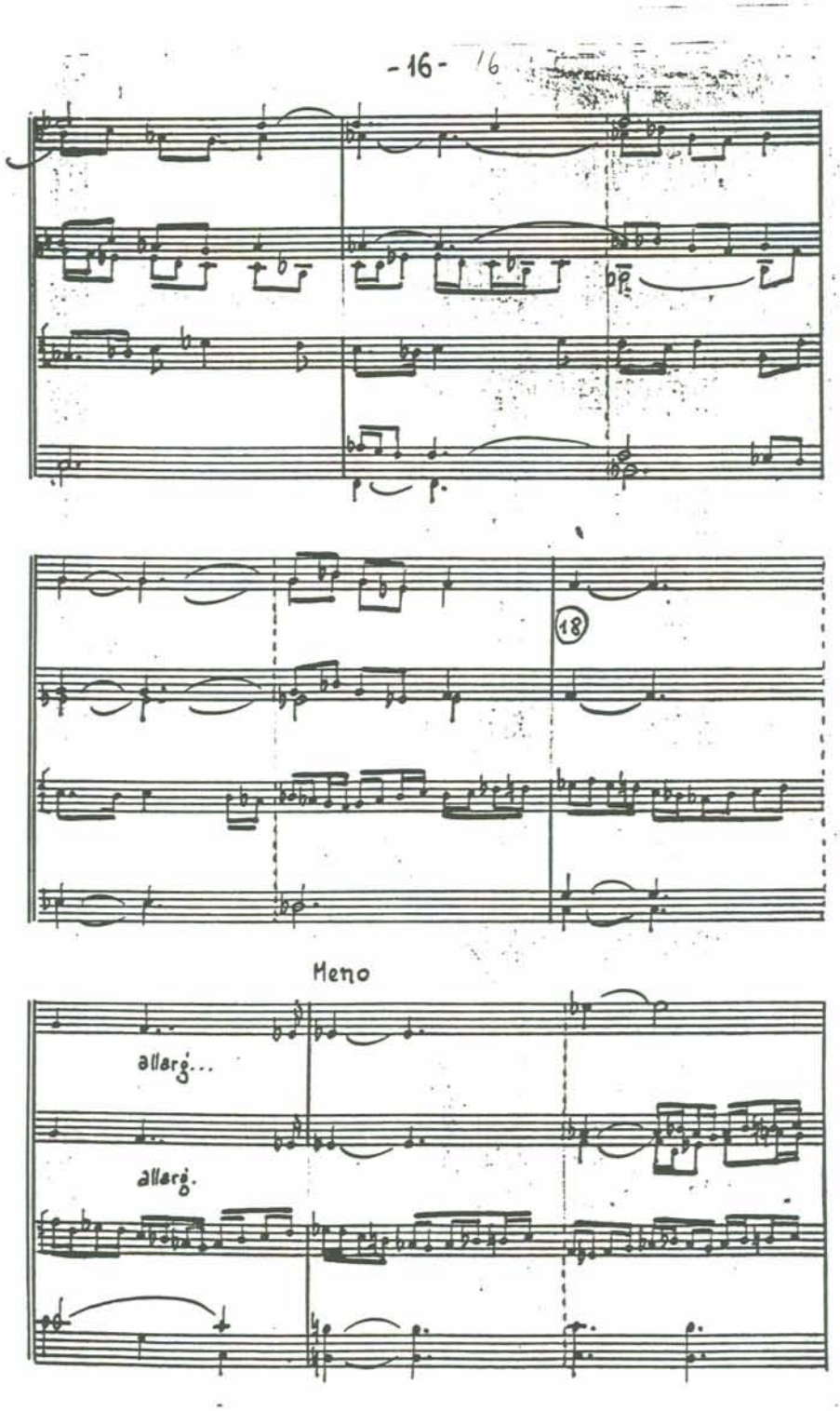
-12-

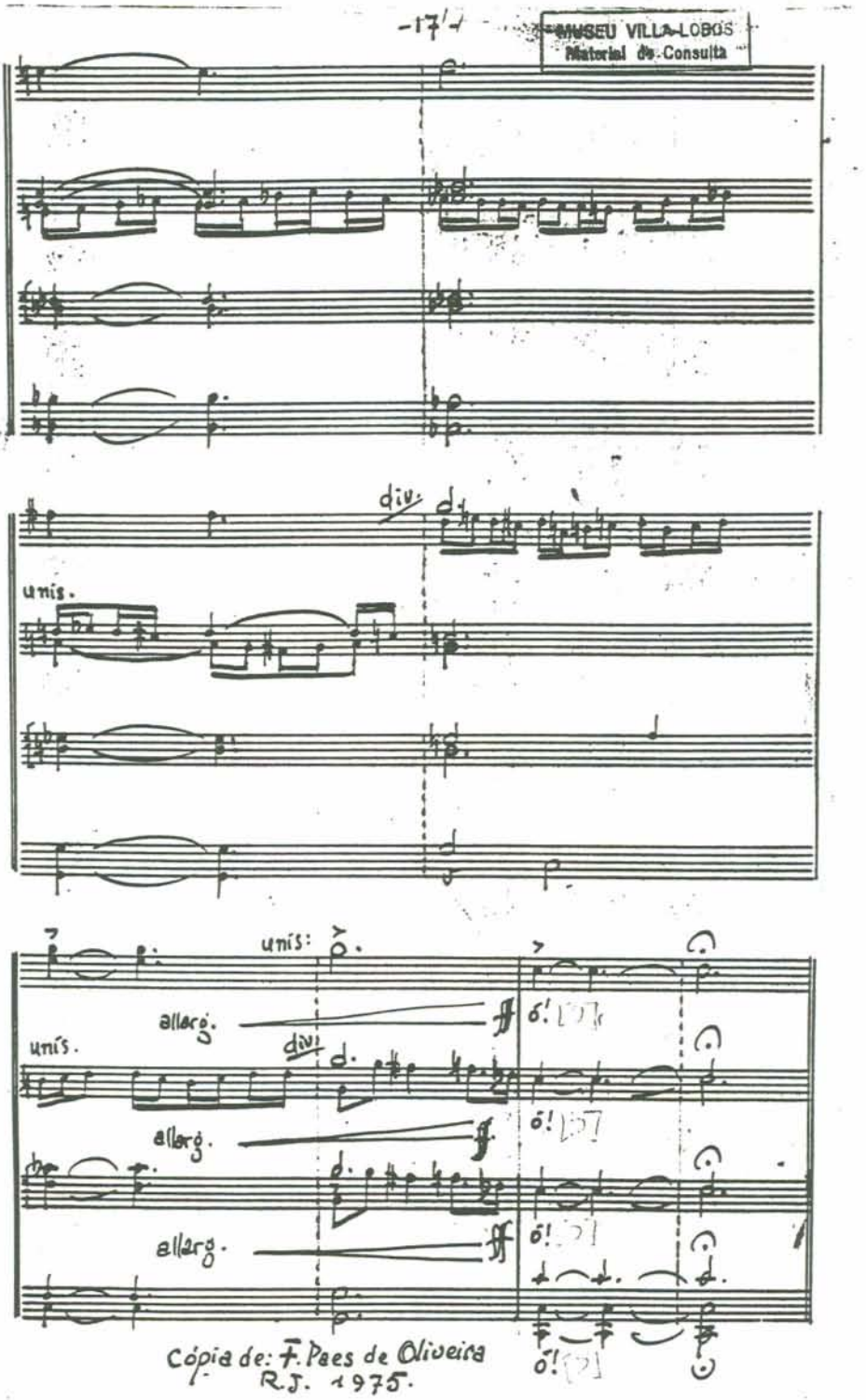



-13-
a tempo
poco rit.
Lá! [la] rall:...
sfz p
fLá! [la]
unis.
Lá!
rall:...
sfz p B.F.
14
poco rit.
rall:...
sfz p B.F.
Ló!
rall:...
sfz p B.F.
TENOR
mf Nan!
15
mf Ló!
an!
mf


-14-
mf
on! [ɑ̃]
mfin! [ɛ̃]
mf
Lá! [la]
on! [ɔ̃]
ó! [ɔ]
nan [nɑ̃]
ó! [ɔ]
Grandioso
on! [ɑ̃]
16
nan! [nɑ̃]
é! [e]
nan!
rall.
nan! [nɑ̃]
on! [ɔ̃]
on! [ɔ̃]
Lá! [la]
unis.
Nan!
Lá! [la]

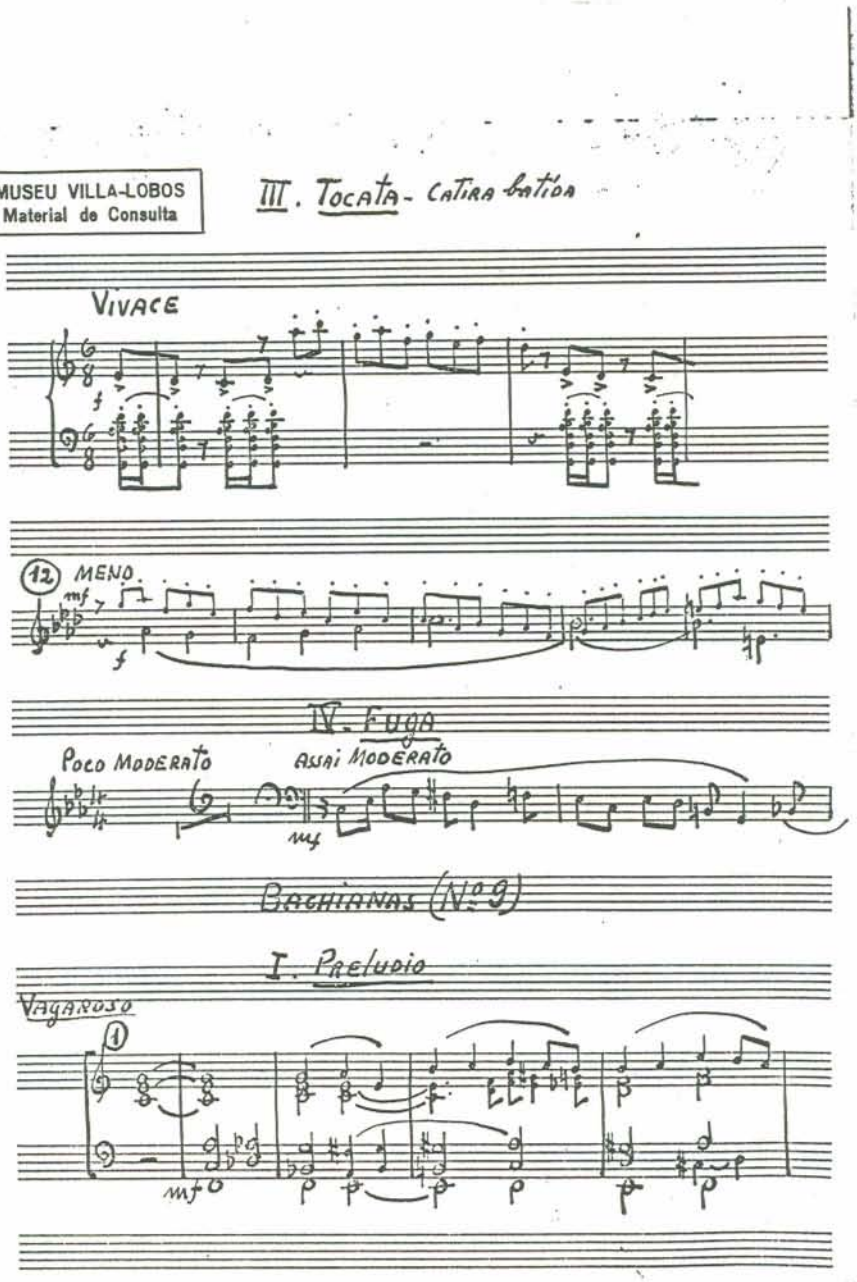

-15-
a tempo
rall:...
rall:...


-16- 16
18
Meno
allarg...
allarg.


-17-
MUSEU VILLA-LOBOS
Material de Consulta
div.
unis.
unís:
allarg.
unís.
div.
allarg.
allarg.
Cópia de: F. Paes de Oliveira
R.J. 1975.

APPENDIX F

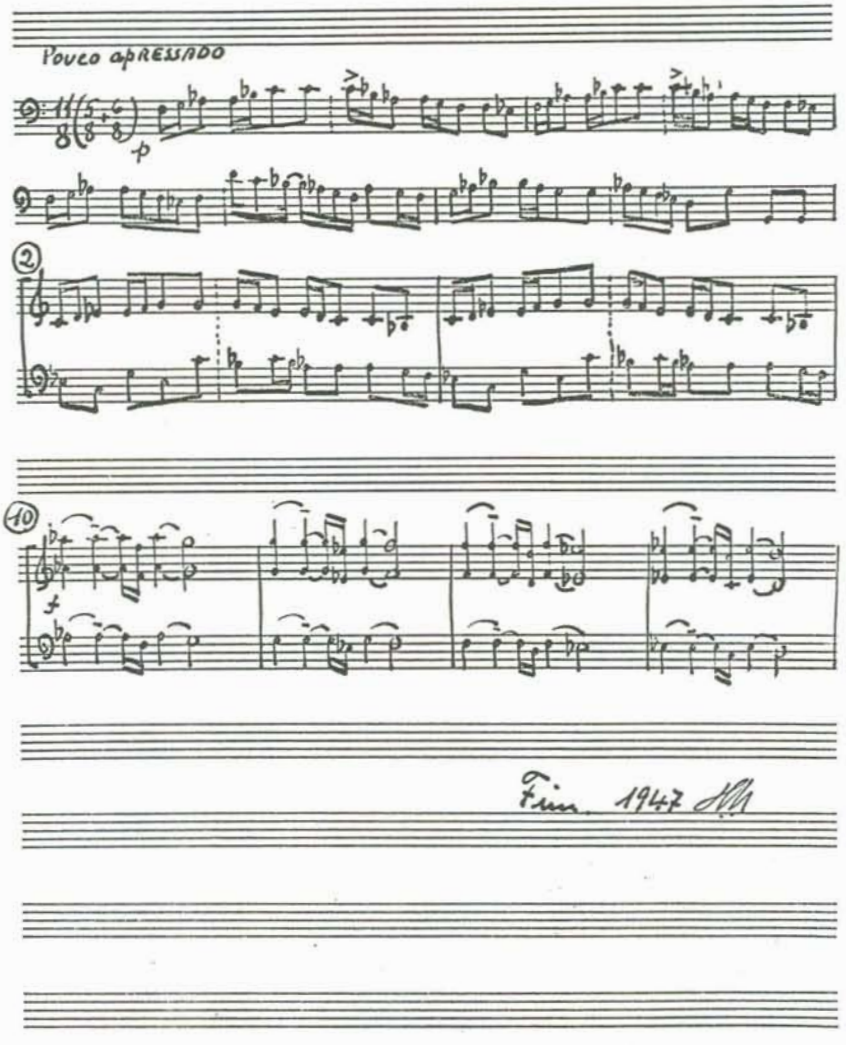
VILLA-LOBOS'S AUTOGRAPH OF THEMES FOR *BACHIANAS BRASILEIRAS NO. 9*



MAPLESON-TRANS-MASTER
NO. 4 "V"

110 WEST 40th STREET
NEW YORK 18, N. Y.

II. Fuga



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NO. 4 "V"

110 WEST 40TH STREET
NEW YORK 18, N. Y.

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Discography

Alma Brasileira, Michael Tilson Thomas and the New World Symphony, RCA 09026-68538-2.

Construção, CD recorded live with the *Orquestra de Câmara Theatro São Pedro*, December 11, 1995, Bayreuth, Germany, Limited edition.

Orchestre National de La Radiodiffusion Française—EMI 7243 5 66964 2 6

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Software

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