MUSICAL AND DRAMATIC FUNCTIONS OF LOOPS AND LOOP BREAKERS IN PHILIP GLASS'S OPERA *THE VOYAGE*

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CHAPTER 1

INTRODUCTION

Background of the Problem

Composers convey meanings of singers' and non-singers' words and activities by traditional musical expressions such as melodies, rhythms, chords, textures, timbres, and dynamics. A listener also hears these expressions in Philip Glass's minimalist opera *The Voyage*, a commemoration of Christopher Columbus. Besides these traditional musical expressions, successions of reiterating materials (RMs, two or more iterations of materials) and non-reiterating materials (NRMs) become new musical expressions.

Statement of the Problem

Analyzing the drama of *The Voyage* only by means of traditional musical expressions is insufficient, and labeling materials as RMs and NRMs only distinguishes NRMs from RMs without considering their functions when placed in successions. A listener needs a new functional analytical approach to the successions of RMs, NRMs, and RMs. For instance, in Example 1, Act III Scene 3, mm. 3297-3302, r. 16 (rehearsal 16), the orchestra highlights the words "never imagined" by traditional musical expressions, which include the change of time signature from 4/4 to 12/8, the change of figurations from reiterating trichords to reiterating tetrachords, and the striking presentation of two consecutive first inversion C and D augmented triads.[1] However, there is another way to analyze this example.

1. All examples in this dissertation are concert scores, in which key signatures are the same for all transposing and non-transposing instruments. See the Section "Step 6: Score Reduction" from Chapter 4 for more details.

A listener also hears Violin 1, Violin 2, Viola, and Cello parts forming a succession of two iterations of m. 3297 in mm. 3297–98, one iteration of in mm. 3299–3300, and two iterations of m. 3301 in mm. 3301–02.[2] Calling this moment a succession of RM, NRM, and RM only distinguishes NRM from RMs without exploring relations among them. By labeling this moment a succession containing two iterations of Loop 1 (m. 3297 and m. 3298), Loop Breaker 1 (mm. 3299–3300), and two iterations of Loop 2 (m. 3301 and m. 3302), a listener perceive musical functions in this succession.[3] Loop 1 first attracts attention by two iterations of itself. When a listener expects a third iteration of Loop 1, Loop Breaker 1 dissatisfies this expectation and leads to two iterations of Loop 2. Loop Breaker 1 gets more attention than a regular third iteration of Loop 1. The musical function of Loop Breaker 1 is to elevate a listener's attention. When Loop Breaker 1 becomes musically functional, it directs a listener's attention to the vocal ensemble's words "never imagined" in the sentence "I never imagined." Loop Breaker 1 creates what Carolyn Abbate calls a "moment of narration" by using music to tell a listener to pay more attention to the words "never imagined."[4] During this moment of narration, the dramatic function of Loop Breaker 1 is a wordless narrator, who uses music instead of words to narrate.

Example 2 is another instance in which distinguishing NRMs from RMs does not illustrate the relations among them. In Example 2, a listener hears a succession of RM (mm. 925–27), RM (mm. 928–30), RM (mm. 931–33), NRM (mm. 934*1–*5, m. 934 beats 1 to 5), and NRM (mm. 934*6–35, m. 934 beat 6 to the end of m. 935) in the orchestral treble clef. This

2. Sometimes a listener may only hear loops and loop breakers in some instruments. To label mm. 3299–3300 as NRM in Example 1, a listener must hear both measures as an undividable unit that only has one iteration.

3. In this dissertation, the word "loop" with all lower case letters signifies the concept of a loop, and the word "Loop" with a capitalized "L" refers to a specific loop in the opera. For Example, "Loop 1" refers to a specific loop in Example 1. The same principle applies to "loop breaker" and "Loop Breaker."

4. Carolyn Abbate, *Unsung Voices: Opera and Musical Narrative of the Nineteenth Century* (Princeton, NJ: Princeton University Press, 1991), 29.

labeling system does not distinguish the differences between NRMs in mm. 934*1–*5 and mm. 934*6–35. If using my labeling system of loops and loop breakers, an analyst knows that NRM in mm. 934*1–*5 is a partial iteration of Loop 3, and NRM in mm. 934*6–35 is Loop Breaker 2, which causes a partial iteration of Loop 3.

Purpose of Study

The purpose of study is to seek moments in the opera when musically functional successions of loops and loop breakers become dramatically functional. In a musically functional succession, the loops and the loop breakers are functional musical materials, because a listener can expect what may happen during and after a loop, and what may happen before and after a loop breaker. When a listener can associate functional loops and loop breakers with particular devices of drama, meanings of singers' and non-singers' words and activities, loops and loop breakers function as dramatic signifiers. The successions containing these loops and loop breakers become dramatically functional.

Research Questions

This dissertation answers the following three questions.

(1) In successions of loops and loop breakers, how many kinds of musical functions? To answer this question, an analyst must find out all kinds of successions in the opera first. In different successions, a listener has various expectations for what may happen before, during, and after loops and loop breakers. After studying these expectations, the analyst can sort out various functions of loops and loop breakers.

(2) How many kinds of dramatic functions in successions? First of all, the analyst studies theories of drama and the libretto to find out how dramatic devices work in the opera (see

Chapter 3). Finally, the analyst seeks moments in the opera when a listener can associate musically functional successions with dramatic devices such as singers' and non-singers' words and activities.

(3) What kind of commemoration of Columbus does Philip Glass intend to show through music in the opera? The analyst can answer this question by answering the following four questions first. Is the opera a celebration of Columbus's discovery of America, a historical account of Columbus's journey to America, a negative commentary on European colonization in America after Columbus's arrival in America, or a new story about exploration in which Columbus is only a part of the story? By studying the score and the libretto of the opera, a researcher can find the answers to these four questions. After finding the answers to the above four questions, the next task is to support the answers by analyzing musical and dramatic functions of loops and loop breakers in the opera.

Scope of the Study

This dissertation explores the musical and dramatic functions of loops and loop breakers in Glass's opera *The Voyage* in seven chapters. In Chapter 1, I justify the use of loops and loop breakers as a new analytical technique for the opera, and introduce the plot, libretto, score, and audio recording of the opera. I investigate possible origins of Glass's loops and loop breakers by studying Glass's compositional devices from his earlier works in Chapter 2: Philip Glass's Musical Language. Chapter 3, Theory and Practice of Drama in *The Voyage*, explores various devices of drama, and the applications of these devices in the opera. Chapter 4, Research Methods, discusses the procedure of this research, and the musical and dramatic functions of loops and loop breakers. Chapters 5 and 6 illustrate the musical and dramatic functions of loops and loop breakers in moments from Acts I, II, and III of the opera, respectively. Chapter 7

concludes with a summary of findings of this research, and suggestions for future studies of this opera and other operas by Philip Glass. In this dissertation, I use the score as the primary source for analysis, and the audio recording as an auxiliary source.[5]

Definition of Terms

Iteration. An *iteration* is "[a] cycle of a set of instructions to be repeated; [for example], [after] ten iterations, the program exited the loop."[6]

Loop. A listener finds a *loop* under two conditions. (1) After hearing two or more successive complete iterations of musical material, a listener identifies the material as a *loop* (Example 3). In Example 3, after hearing all three measures, a listener realizes that there are three iterations of the material from the first measure. (2) After hearing one complete iteration of material and one partial iteration of the same material interrupted by a *loop breaker*, a listener identifies the complete iteration as a *loop*, and the partial iteration as a partial *loop* (Example 4). In Example 4, a listener hears a complete iteration of a loop in the first measure, followed by a partial iteration of a loop (three quarters of a loop) in the second measure and a *loop breaker* in the third measure.

Loop Breaker. A *loop breaker* contains non-reiterating material which interrupts *or* terminates a loop. A loop breaker interrupts a loop when a listener hears a loop breaker after a partial loop (Example 4). In Example 4, the loop breaker in the third measure interrupts the second iteration of the loop in the second measure. When a loop breaker appears after two or

5. For the score, see Phillip Glass, *The Voyage: An Opera in Three Acts*, libretto by David Henry Hwang (New York: Dunvagen Music Publishing, 1998), 1–866. For the audio recording, see Philip Glass, *An Opera in Three Acts*, Landestheater Linz (Linz State Opera) and Bruckner Orchester Linz, conducted by Dennis Russell Davies, Orange Mountain Music 0017, 2006, compact disc.

6. *The American Heritage of Dictionary of the English Language*, 5th ed., s.v. "iteration," accessed September 21, 2015, https://www.ahdictionary.com/word/search.html?q=iteration&submit.x=54&submit.y=22.

more iterations of a loop, the loop breaker terminates the loop (Example 5). In Example 5, the loop breaker in the third measure terminates two iterations of a loop in the first two measures. Occasionally, a loop can also proceed to another loop without a loop breaker between both loops (Example 6). In Example 6, after two iterations of the first loop in the first two measures, the music moves to two iterations of the second loop in the third and fourth measures without a loop breaker. Successions of two different loops without loop breakers draw less attention to a listener than those with loop breakers. Two adjacent loops without a loop breaker between them are less likely to evoke musical and dramatic functions. This dissertation focuses mainly on successions of loop and loop breakers that a listener is more likely to perceive them as musically and dramatically functional.

Listener. A *listener* refers to a person who has proficient listening competence to remember and identify what was played. A person, who does not remember what was reiterated and not reiterated, cannot identify loops, partial loops, and loop breakers. Proper ear trainings help to acquire proficient listening competence.

Invalidation of loops. Each iteration of a loop must contain the same pitches, rhythms, and chords from the first iteration. Transposition, change of register, augmentation and diminution of note values, change of rhythmic patterns, and inversions of chords *invalidate* a loop (Examples 7, 8, 9, 10, 11 and 12). A listener does not hear two iterations of a loop in Example 7, because the second measure is an upward transposition of the first measure by a perfect fifth. In Example 8, the second measure is an octave higher than the first measure. The change of register invalidates the loop in this example. The augmentation of note values in Example 9 turns both measures into two non-loops. Similar to Example 9, the diminution of note values in Example 10 makes both measures non-looping. Example 11 shows a change of rhythmic pattern from one quarter note per pitch in the first measure to two eighth notes per pitch

in the second measure. The change of rhythmic pattern in the second measure nullifies a loop. In the opera, one of Glass's musical language is the use of arpeggios in which the lowest sounding note in each chord moves by step. In Example 12, the first measure contains ascending arpeggios in root positions, but the second measure contains ascending arpeggios in first inversions. The inversions in the second measure invalidate both measures as two iterations of a loop.

Succession. The definitions of loops and loop breakers illustrate what happens *before* a loop breaker. Successions of loops and loop breakers contain materials *before* and *after* loop breakers. The following shows five different successions of loops and loop breakers (see musical illustrations of Successions 1, 2, 3, 4, and 5 in the Appendix).[7]

Succession 1. This succession starts with two or more complete iterations of a loop, followed by one partial iteration of a loop, a loop breaker, and the next loop.

Succession 2. The first three measures of *Succession 2* are identical to those of Succession 1 (compare Successions 1 and 2 in the Appendix). But, unlike Succession 1, the loop breaker in Succession 2 leads back to the previously interrupted loop.

Succession 3. This succession contains two or more iterations of a loop, followed by a loop breaker, and the next loop.

Succession 4. When the loop breaker in Succession 3 proceeds to the previously interrupted loop, Succession 3 becomes Succession 4 (see musical illustrations of Successions 3 and 4 in the Appendix). Successions 3 and 4 resemble Robert Fink's observations on television broadcast. Fink states that both "minimalist music and broadcast television share a special *kind* of linearity." "Unrelated advertising and trailers are constantly cutting into the dramatic progression" of broadcast television. The broadcast television "had created an audience for a

7. In this dissertation, the word "succession" with all lower case letters signifies the concept of a succession, and the word "Succession" with a capitalized "S" refers to a specific succession in the opera.

musical style that moved through time in the same multilayered, interrupt-driven way."[8] Based on Fink's idea, contents of loops resemble television programs while contents of a loop breaker between two loops resemble television advertisements and trailers between two different television programs (Succession 3), or between two segments of the same television program (Succession 4).

Succession 5. In this succession, after one complete iteration of a loop and one partial iteration of a loop, a loop breaker leads to the next loop.

Shadow. The verb "shadow" in this dissertation denotes a musical representation of a word in which the music is not the word itself but the shadow of the word. For example, when a loop breaker shadows the word "over" by terminating a loop, the loop breaker conveys the meaning of the word "over" by declaring a loop is "over." A listener associates the loop-terminating breaker with the meaning of the word "over," not with the pronunciation and the spelling of the word.

Foreshadow. The verb "foreshadow" illustrates a situation when a loop breaker functions as the shadow of an upcoming event that appears ahead of the event itself. For example, when a listener hears a loop breaker before a singer's entrance in the next loop and associates the loop breaker with this event, the loop breaker becomes *the shadow before* this event. Therefore, the loop breaker *foreshadows* a singer's entrance.

Chord symbols. I use Carl Brandt and Clinton Roemer's chord symbols to denote different chords.[9] The following is a list of chord symbols used in this dissertation.

CM: C major triad.

8. Robert Fink, "Going with the Flow: Minimalism as Cultural Practice in the USA since 1945," in *The Ashgate Research Companion to Minimalist and Postminimalist Music*, ed. Keith Potter, Kyle Gann, and Pwyll Ap Siôn (Burlington, VT: Ashgate, 2013), 207–08.

9. Carl Brandt and Clinton Roemer, *Standardize Chord Symbol Notation (A Uniform System for Music Profession)* (Sherman Oaks, CA: Roerick Music Co., 1976), 11–26.

Cm: C minor triad.

C+: C augmented triad.

C°: C diminished triad.

CM7: C major seventh chord.

Cm7: C minor seventh chord.

C7: C dominant seventh chord.

Cm^{M7}: C minor-major seventh chord.

CM^{add6}: C major triad with an added sixth.

Cm^{add6}: C minor triad with an added sixth.

$C+^{add6}$: C augmented triad with an added sixth.

Delimitations

This dissertation does not explore why listeners can and cannot perceive materials as loops and loop breakers. Finding answers to these questions requires a researcher to compare and contrast various listeners' perceptions of musical passages containing loops and loop breakers.

Limitations

While applying the concepts of loops and loop breakers to approach the music and drama, a listener encounters the following four limitations that lead to debatable analyses.

(1) A listener may come up with two analyses that both match the definitions of loops and loop breakers. In Example 1, the first analysis contains two iterations of Loop 1, Loop Breaker 1, two iterations of Loop 2 (see discussion in "Statement of the Problem" Section from Chapter 1). In the second analysis of Example 1 shown in Example 13, a listener hears four iterations of Loop 5, two iterations of Loop 6, two iterations of Loop 7, four iterations of Loop 8, and no loop

breaker in Violin 1, Violin 2, Viola, and Cello. Based on the definitions of loops and loop breakers, both analyses are possible.

(2) When there are two possible analyses, only one of them contains dramatic functions. In Example 1, the dramatic function of Loop Breaker 1 is to shadow the words "never imagined" (see discussion in the Section "Statement of the Problem"). An analyst cannot find dramatic functions in the second analysis of Example 1, because it does not contain any loop breaker (see discussion in Point *(1)* and Example 13).

(3) The Loop after a loop breaker can be both a new loop and a variant of the previous loop. In Example 14, a listener can label the loop after Loop Breaker 3 as Loop 10 (square brackets) and Loop 9A (curly brackets). In terms of lengths, Loop 10 is a new loop because its length is shorter than Loop 9. When a listener labels the loop after Loop Breaker 3 as Loop 9A instead of Loop 10, the listener considers Loop 9A a half Loop 9, which is a variant of Loop 9.

(4) Is the material a partial or false iteration of a loop in a loop breaker? In Example 15, a listener may perceive the fourth measure in two ways: as a *partial* and *false* iteration of Loop 11. A listener perceives the fourth measure as a *partial* loop because it contains the first half of Loop 11. As a result, a listener hears a succession containing two iterations of Loop 11, Loop Breaker 4, one partial iteration of Loop 11, Loop Breaker 5, and two iterations of Loop 12. This succession is not one of the five common successions in the opera (see the Appendix). When a listener considers the fourth measure an internal part of Loop Breaker 6, the measure ceases to function as a starting point of Loop 11, and becomes a *false* iteration of Loop 11. Two iterations of Loop 11, Loop Breaker 6, and two iterations of Loop 12 form Succession 3 (see the Appendix).

Plot

Philp Glass and David Henry Hwang produced the music and the drama of *The Voyage*. Philip Glass conceived the plot and composed the music, while David Henry Hwang crafted the dialogues and actions in the libretto (see the Section "Libretto" for more details).[10] The Metropolitan Opera commissioned the opera in commemoration of the 500th Anniversary of the discovery of America on October 12, 1992 at the Metropolitan Opera House.[11] According to Glass's preface in the CD booklet, the opera, as both a fiction and science fiction, concerns four different kinds of discoveries inspired by Christopher Columbus: a scientific discovery by the scientist Stephen Hawking, the fictional discovery of earth by the ancient aliens, Columbus's discovery of America, and the future fictional discovery of the home planet of the ancient aliens by the Earth Twins and the Space Twins.[12]

Glass and Hwang present the story of the opera in a non-chronological manner. The prologue honors the scientist Stephen Hawking in modern times. In Act I, near the end of the Earth's ice age in about 50,000 B.C., the fictional ancient aliens discovered Earth. Act II partially recounts the story Christopher Columbus's journey to the Indies in 1492. In Act III, the fictional future human scientists in 2092 discovered the ancient alien's home planet, and prepared a spaceship to find the planet. The Epilogue in Act III shows a fictional past in which an unknown group of people transported Columbus from his death bed to the stars in 1506.[13]

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10. Phillip Glass, *The Voyage: An Opera in Three Acts*, libretto by David Henry Hwang (New York: Dunvagen Music Publishing, 1998), i. Phillip Glass, CD Booklet, *The Voyage: An Opera in Three Acts*, Landestheater Linz (Linz State Opera) and Bruckner Orchester Linz, conducted by Dennis Russell Davies, Orange Mountain Music 0017, 2006, compact disc, 2.

11. About the commemoration, see Phillip Glass, CD Booklet, 2. About the premiere date, see Metoperafamily.org, "[Met Performance] CID: 310210," *Archives.metoperafamily.org*, accessed December 15, 2014, http://archives.metoperafamily.org/archives/ scripts/cgiip.exe/WService=BibSpeed/fullcit.w?xCID=310210&limit=500&xBranch=ALL&xsdate=&xedate=&theterm=1992-93&x=0&xhomepath=&xhome=.

12. Glass, CD Booklet, 3.

13. Glass, CD Booklet, 3–5.

Those who are familiar with the plot of *The Voyage* can proceed to the discussion on the plot design after the following synopsis by Glass from the opera's CD booklet. Those who are unfamiliar with the plot can read the synopsis below:

> [Act I] Prologue: While a chorus poses eternal questions about the nature of time and space, the Scientist, seated in a wheelchair that descends from the stars, ponders the idea of exploration. Despite faulty equipment, inadequate bodies and finite minds, there always have been people who have the courage to follow where their vision leads.
>
> Act I Scene 1: Toward the end of the earth's Ice Age, a spaceship hurtles out of control toward our own solar system. Inside, the Commander, complaining that nothing on her ship works—neither the lights, nor the engines, not even her training, which did not prepare her for this eventuality—foresees a beast licking its chops, waiting for the dead. As the spaceship plunges closer to earth, the First Mate punches up an image of the rapidly approaching planet on his computer and describes its life-giving properties—water, oxygen, vegetation and humanoid forms. Meanwhile, the Second Mate relives his wretched childhood, as the Ship's Doctor remembers her garden and children at springtime. The spaceship crashes.
>
> Act I Scene 2: Still at his computer screen, the First Mate sees images of a late-Ice Age planet, whose terrain in some areas is similar to our own. As the Commander asks to see a last glimpse of the planet she and her shipmates will soon forget, the First Mate adjusts his screen to receive a map of the cosmos. In one corner, blinking, is the travelers' home planet. Each blink produces a three-note chord. As each crew member takes one of the ship's pulsating directional crystals, any two of which when brought together will point the way home. He pictures in his mind, the world he would like to live in—the Second Mate pictures a realm ruled by machines, where he turns the sky black (the Europe of the Industrial Revolution); the First Mate pictures a continuation of his voyage (he is transported to a pavilion near the top of a Tibetan mountain); and the Ship's Doctor pictures a place where people will listen eagerly to her stories (she appears in India, with masses of children around her).
>
> Act I Scene 3: Alone, the Commander stares at the pulsating crystal in her hand. She would like to have died rather than be bound by boredom. She prepares to exit the spacecraft, wondering what fate awaits her. As the door opens and she steps out, natives, performing the rites of spring, think she is a fantastic creature, barely humanoid. The Commander is swept up in the natives' ritual.
>
> Act II Scene 1: At Granada in 1492, Queen Isabella and the Spanish court bid farewell to Columbus as he sets out for the Indies. As the queen encourages the navigator by quoting from Scripture, members of the court promise him titles, wealth and power. This scene turns out to be…
>
> Act II Scene 2: …something remembered by Columbus on board the Santa Maria. The First Mate's voice, calling out the dawn watch, jolts Columbus back to the sordid realities of life at sea. It is the thirty-second day into the voyage, and his men no longer have faith in him or his mission. The awesome solitude seems to crush in on him when he has a vision of Isabella, who reminds him that his dream, before he set out, was so real it could have come only from God. But, argues Columbus, "As through the expanses of

blue I see my own face, and it is old." Isabella reminds him of Noah's faithfulness. The explorer further expresses his doubts about "the order of God, and the Turks and Jews we kill in His name." As the queen appears surrounded by a radiant holy light, looking like the Madonna, she calls on the explorer to remember a virgin "who felt in her belly a stirring, and held fast to the faith this was God." When Columbus requires a promise that by this expedition he will further the kingdom of God, Isabella, swearing it is so and becoming more clearly a mortal woman, claims to be his queen, his love, his one true God. A bird sings, and the First and Second Mates cry out "Tierra!"[14]

Act III Scene 1: In a space station in our solar system in the year 2092, Space Twins 1 and 2 scan various sectors of the universe, seeking the origins of life. At the same time, archeologists Earth Twins 1 and 2, each carrying a glowing crystal from Act I, meet in a research laboratory on earth . While hiking in the Andes, one of them heard a low-pitched tone; the other was digging near the Ganges when she heard a high-pitched tone. As the Earth twins bring their crystals together, the original three-note chord is recreated, causing the space station's scanner to focus on the "home" planet in the cosmos from which the original visitors came.

Act III Scene 2: The Commander, alone at first, muses on the eternal quest of humanity; It is a goal, perhaps, to be realized in the coming voyage. In a jubilant send-off, various dignitaries and politicians dance before a brass band and a large, enthusiastic crowd. The chorus of good wishes dims as the team of explorers enters the spaceship.

Act III Scene 3: Inside the spaceship, each member of the expedition, the Commander, Space Twins 1 and 2 and the First Mate, equipped with a telephone headset, bids farewell to his or her loved ones. Once again, mankind is off on a voyage of discovery, exploring the unknown.

[Act III] Epilogue: As the space travelers fade away, Columbus appears on his deathbed. It is 1506. Dominican monks chant a requiem, and lsabella comes to accompany the explorer to the realm of which she already is a part. As he accuses the queen of failing to keep her promises, she ridicules his assurance as being the child of pride, his actions in the New World as being guided by Lucifer. She invites him to her bed. Columbus resists her, claiming, "the journey that awaits is far more seductive than all your last temptations." Still pondering questions raised by man's eternal curiosity, he is transported to the stars.[15]

The above synopsis shows characteristics of Jann Pasler's concepts of *narrativity*, *anti-narrative*, and *non-narrative*. According to Pasler, narrativity "allows a perceiver to develop expectations, grasp together events and comprehend their implications."[16] Within each scene of each act, a perceiver can expect events to unfold chronologically. When comparing contents

14. *Tierra* is Spanish for land.

15. Glass, CD Booklet, 4–5.

16. Jann Pasler, "Narrative and Narrativity in Music," in *Writing through Music: Essays on Music, Culture and Politics* (New York: Oxford University Press, 2008), 36.

among acts, a perceiver notices that the acts in the opera illustrate characteristics of an anti-narrative. An anti-narrative relies "on the listener's expectation of narrative but frustrate[s] it through continual interruption of a work's temporal processes and proceed by change without narrative transformation."[17] A listener notices sudden leaps of time without transitions in the opera from modern times to 50,000 B.C. between Act I Prologue and Act I Scene 1, from 50,000 B.C. to 1492 A.D. between Act I and Act II, from 1492 to 2092 between Act II and Act III, and from 2091 back to 1506 between Act III and Act III Epilogue. For example, the leap from 1492 in Act II to 2092 in Act III occurs without a transition, in which Glass could have unfolded events chronologically from 1492 to 2092. The opera as a non-narrative, "has elements of narrative without allowing them to function as they would in a narrative."[18] A listener finds elements of narrativity within scenes, but finds elements of anti-narrative among acts. The mixture of narrativity and anti-narrative makes the opera a non-narrative.

Libretto

Philip Glass's librettist of *The Voyage* David Henry Hwang worked with Glass when producing "*1000 Airplanes*, and the hit Broadway play, *M. Butterfly*."[19] In an interview conducted by Kyle Gann on October 27, 1992, Glass states that "David is [a] first-generation Chinese American," and does note write from a "white European male viewpoint" about Columbus and the Indians (Native Americans).[20] By choosing Hwang as the librettist of the opera, Glass is more likely to make the operatic commemoration of Columbus from a perspective different from traditional viewpoints.

17. Pasler, "Narrative and Narrativity," 38.
18. Pasler, "Narrative and Narrativity," 40.
19. K. Robert Schwarz, *Minimalists* (1996; reprint, New York: Phaidon, 2008), 159. The complete title of *1000 Airplanes* is *1000 Airplanes on the Roof* (composed in 1988).
20. Gann, "Midtown," 30.

In terms of the length of the libretto, *the Voyage* is shorter than Glass's previous opera *The Making of the Representative of Planet 8* (1986). The text of *The Voyage* is only fifteen pages long, while *The Making of the Representative of Planet 8* has an eighty-page libretto.[21] When comparing both operas, Glass thinks that with a shorter libretto, *The Voyage* "could tell a story in broad stroke, and [have] a powerful emotional punch."[22]

Enrique Alberto Arias's analysis of the libretto shows the opera's non-chronological nature of an anti-narrative. Arias states that "each act has a different central figure" and "linking minor characters [associated with the central figures]."[23] Based on Arias's observation, I discovered the central figures in the opera—the Scientist in the Prologue, the ancient alien female Commander in Act I Scenes 1, 2, and 3, Columbus in Act II, the future human female Commander in Act III, Columbus in Act III Epilogue. Glass and Hwang present these central figures out of time, a feature of an anti-narrative.

The linking minor characters include the Scientist in Act I Prologue, First Mate and Second Mate in Act I, Columbus's First Mate and Second Mate in Act II, Ship's Doctor and Second Mate in Act I, Space Twin 1 and Space Twin 2 in Act III, and the choirs in Act I, II, and III. Glass and Hwang do not present these linking minor characters in a chronological flow. Instead, they connect these minor characters to the central figures from different acts by means of the minor characters' duties and functions in the drama.

A listener can relate First Mate, a science officer who interprets information from the space ship's computer, to the central figure in Act I prologue, the Scientist, since First Mate and the Scientist both pursue a career in science. First and Second Mates in Act I and Act II serve

21. Schwarz, *Minimalists*, 159.
22. Ibid.
23. Enrique Alberto Arias, "New Worlds to Conquer: Operatic Depictions of the Age of Discovery," *The Music Review* 54, no. 1 (February, 1993): 21–22.

under the commanding officer of a space ship and a ship, respectively. The chorus in the opera has the function of celebrating the arrival or departure of central characters in each act. In Act I Scene 3, the chorus representing the ancient earthlings preforms the rites of spring to welcome the arrival of the ancient alien female commander.[24] In Act II Scene 1, the chorus celebrates Columbus's departure. In Act III Scene 2, the chorus of dignitaries bid farewell to the future human space explorers.

Score

In the score of *The Voyage*, Glass uses rehearsal numbers instead of measure numbers.[25] Glass's rehearsal numbers restart from 1 at the beginning of each scene of Act I, II and III. In other words, a reader of the score can find rehearsal number 1 in each scene of each act. I have added a continuous system of measure numbers to the score in order to distinguish rehearsal 1 in one scene from another. Glass places letter "A" after an Arabic number to denote the second iteration of orchestral parts. He also places "A1" after an Arabic number to denote the third iteration of orchestral parts. For Example, rehearsal 84A in Act I Scene 3 is the second iteration of the orchestral parts of rehearsal 84 in Act I Scene 3. Rehearsal 84A1 in Act I Scene 3 stands for the third iteration of the orchestral parts of rehearsal 84 in Act I Scene 3. See Table 1 for Glass's rehearsal numbers and my measure numbers. I place tables, hypothetical musical examples, and actual musical examples from the opera in the Section "Tables and Musical

24. The rites of spring here is a fictional ritual of the natives in 50000 B.C., and is unrelated to Igor Stravinsky's *The Rite of Dance*.

25. Phillip Glass, *The Voyage: An Opera in Three Acts*, libretto by David Henry Hwang (New York: Dunvagen Music Publishing, 1998), 1–866.

Examples" after the main body of the dissertation. I designate short illustrations and short musical snippets in the main body of the dissertation as figures.[26]

I use the following abbreviations and symbols when referring to rehearsal numbers, beats in the measure, and pitches. For example, r. 1 stands for rehearsal 1, and rr. 1–2 stands for rehearsals 1 to 2. When referring to beats in the measure, an asteroid (*) and the beat number is added after the measure number. For instance, m. 1*1 denotes the first beat of measure 1; mm. 1*1–*3 denotes a duration from the first beat to the third beat of measure 1, mm. 1*1–3 denotes a duration from the first beat of measure 1 to the end of measure 3, and mm. 1*1–2*3 denotes a duration from the first beat of measure 1 to the third beat of measure 2. I use the Acoustical Society of America standard to denote a pitch. An upper case note name with an Arabic number is used to denote pitches in a specific octave. For example, C4 stands for the middle C, C3 stands for the pitch that is an octave lower than the middle C, and C5 stands for the pitch that is an octave higher than the middle C.

Audio Recording

There are two places in *The Voyage* where the audio recording used in this research does not match the score.[27] In the Epilogue, the character Isabella (Queen of Spain) sings the following text in the recording, but the score only shows the orchestral accompaniment of the text in mm. 3563–3570 (rr. 46–47):

> ISABELLA: Liar, Liar, your [Columbus's] lust was never for knowledge,
> But for the breath of God

26. See the Sections "List of Tables" and "List of Musical Examples" for the page numbers of tables, hypothetical musical examples, and real musical examples. See the Section "List of Figures" for the page numbers of short illustrations and short musical snippets.

27. Philip Glass, *An Opera in Three Acts*, Landestheater Linz (Linz State Opera) and Bruckner Orchester Linz, conducted by Dennis Russell Davies, Orange Mountain Music 0017, 2006, compact disc.

Also in the Epilogue, between Isabella's text "I see you resist my song" (mm. 3597–98 in r. 54) and Columbus's text "I'm sorry, I'm unable to tarry here longer" (mm. 3602–06 in rr. 55–56), six lines of the text and the music of Isabella and Columbus are only available in the recording, but not in the score. In mm. 3599–3601 (r. 55), there is only music without any text. The six lines of text are shown below:

> ISABELLA: Is this comfort, comfort for those extinguished by greed?
> COLUMBUS: Can we build up without also tearing down?
> ISABELLA: Does your "progress" make from life one long death?
> COLUMBUS: Can we do other than follow the light in our hearts?
> ISABELLA/ COLUMBUS: Human Beings are creatures compelled to re-imagine the world.
> ISABELLA: Goodbye, Goodbye.

CHAPTER 2

PHILIP GLASS'S MUSICAL LANGUAGE

A listener finds compositional devices from a composer's earlier compositions that occur so often and become musical idioms that form a musical language. Knowing the structures and expressions of Philip Glass's common compositional devices helps to learn Glass's musical language in *The Voyage*. The investigation of structures concerns with the procedures that turn unorganized materials into organized devices, while the exploration of expressions deals with meanings of these devices for various listeners.

Glass's Five Compositional Devices

Additive Processes

According to Elliot Schwartz and Daniel Godfrey, an additive process "extends a repetitive melodic pattern by increments of the smallest rhythmic value."[28] In the first three measures of *Music in Similar Motion*, Schwartz and Godfrey point out that "each measure is repeated many times at a very rapid tempo," and extends by "increments of the smallest rhythmic value" (Example 16).[29] In Example 16, the smallest rhythmic value is eighth note. The second measure contains the content from the first measure with added trichords in the treble and bass clefs (see notes surrounded by rectangles), and the third measure contains the content from the

28. Elliot Schwartz and Daniel Godfrey, *Music since 1945: Issues, Materials, and Literature* (New York: Schirmer Books, 1993), 322.

29. Schwartz and Godfrey, *Music since 1945*, 322. The score excerpt in Example 16 is from Example 16.2 in Schwartz and Godfrey, *Music since 1945*, 323. Example 16.2 does not show the number of iterations needed for each measure, and the tempo for the composition. Annotations in Example 16 are mine.

second measure with added tetrachords in the treble and bass clefs (see notes surrounded by rounded rectangles).

Similar to Example 16, Glass also uses additive processes in *The Voyage* (Example 17). There are eight iterations of a pattern containing two dyads and a trichord in Clarinets in B♭, Electric Piano, and Viola in mm. 2768–71.[30] From m. 2772 to m. 2775, Glass added a dyad to each iteration of the pattern (see notes surrounded by rectangles). A listener can perceive this example as an eight-iteration loop followed by a four-iteration loop.

Subtractive Processes

Keith Potter observes that a reversed additive process is a subtractive process.[31] Opposite to additive processes, a listener hears notes subtracted from reiterating melodic patterns. In Figures 4 to 7 from Glass's *Two Pages* (1969), each melodic pattern in each figure reiterates multiple times (Example 18).[32] In Example 18, a listener hears subtractive processes within a melodic pattern, and when one melodic pattern moves to another. After hearing Figures 4 to 7, a listener discovers that the number of notes decreased from fourteen to twelve, twelve to nine, and nine to five (see curly brackets). Subtractive processes also occur within each figure (see square brackets). In Figure 4, a listener hears the numbers of notes decrease from five to four, four to three, and three to two. In Figure 5, the numbers of notes drop from five to four, and four to three. A tetrachord follows a pentachord in Figure 6. A listener hears an arithmetic progression with common difference of minus one in each Figure.

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30. Example 17 is a concert score. The key signature is the same for each instrument.

31. Keith Potter, *Four Musical Minimalists: La Monte Young, Terry Riley, Steve Reich, Philip Glass* (Cambridge: Cambridge University Press, 2000), 289.

32. The score excerpt in Example 18 is from Example 4.5 in Potter, *Four Musical Minimalists*, 289. Example 4.5 does not show the number of iterations needed for each figure. Potter's figure is equivalent to a rehearsal number. Annotations in Example 18 are mine.

When comparing subtractive processes in Example 18 from *Two Pages* and the orchestral bass clef of Example 19 from *The Voyage*, a listener notices similarities and differences. Example 19 has four iterations of a nonachord, which is a melodic pattern with a curly bracket and a number "9" above it. Similar to Example 18, each iteration of a nonachord from Example 19 form an arithmetic progression with common difference of minus one (see numbers 4, 3, and 2 below each pattern). In Example 18, subtracting material from the far right of a pattern creates a new pattern. For example, Figure 5 results from deleting the dyad on the far right of Figure 4. The same principle applies to Figures 6 and 7. Subtractive processes in Example 19 are not as predictable as those in Example 18. In Example 19, the tetrachords in mm. 3314–15 result from the subtractions of trichords and dyads from the middle and the right of the nonachords in mm. 3310–13 (see the marking "9–3–2" in the example). In mm. 3316–17, a listener can perceive the eight iterations of trichords in two different ways. By subtracting the eighth notes from the far right of the tetrachords in mm. 3314–15, a listeners hear eight iterations of "4–1." Eight iterations of "9–4–2" result from subtracting tetrachords and dyads from the left and the right of the nonachords in mm. 3310–13.

Mixture of Additive and Subtractive Processes

In a mixture of additive and subtractive processes, melodic patterns "are subjected to additions and deletions."[33] For instance, Glass's 1967 *Strung Out* for amplified violin (Example 20), begins with a dyad (marked with "2") and a trichord ("3").[34] The dyads are subject to additions of two notes and one note ("2+2" and "2+1"), and the trichords are subject to additions of one note and subtraction of one note ("3+1" and "3−1"). If a listener perceived the second

33. Schwartz and Godfrey, *Music since 1945*, 331.

34. The score excerpt in Example 20 is from Example 16.7 in Schwartz and Godfrey, *Music since 1945*, 331. Annotations in Example 20 are mine.

pentachord in the second line as a recapitulation of the initial pentachord from the first line ("2" and "3"), the subtractive and additive processes would cease to function. If perceived as subtractive and additive processes of the first pentachord of the second line ("2+1" and "3−1" become "(2+1)−1" and "(3−1)+1"), the subtractive and additive processes would continue to function.

Some successions of loops and loop breakers in *The Voyage* evolve from the mixture of additive and subtractive processes. A listener hears mixtures of both processes in Successions 1 and 2 (see the Appendix). For example, if the first loop in Succession 1 had three iterations, the second and third iterations function as additive processes of the first iteration. The same applies to Succession 2. Loop breakers trigger subtractive processes of loops in Successions 1 and 2. Partial iterations of the loops in Successions 1 and 2 are subtractive processes caused by the loop breaker. The subtractive process cannot occur by itself without a loop breaker. That is to say, a succession cannot end with a partial loop.

Isorhythmic Overlap

Isorhythmic overlap occurs when ostinato patterns of "varying lengths are stated simultaneously."[35] Example 21 illustrates an instance of isorhythmic overlap in Figure 2 of the "Train" section from Glass's 1976 opera *Einstein on the Beach*.[36] Piccolo, the treble clef of Organ 1, and Organ 2 have three iterations of Ostinato Pattern 1 (see notes surrounded by rectangles). In Soprano Saxophone, Tenor Saxophone, and the bass clef of Organ 1, a listener hears four iterations of Ostinato Pattern 2 (see notes surrounded by isosceles trapezoids).

35. Schwartz and Godfrey, *Music since 1945*, 325.

36. The score excerpt in Example 21 is from Example 4.17 in Potter, *Four Musical Minimalists*, 332. Annotations in Example 21 are mine. Figure 2 has more than one iteration, but Potter does not specify how many iterations Figure 2 should have. Potter's figure is equivalent to a rehearsal number.

Sopranos and Altos sing three iterations of Ostinato Pattern 3 with solfège syllables (see notes surround by hexagons). These three patterns form three layers of time signatures—8/8, 3/4, and 4/4. After twelve beats (one quarter note per beat), the beginning points of these three patterns coincide again.

In *The Voyage*, Act I Prologue, a listener can hear isorhythmic overlap involving three ostinato patterns (Example 22).[37] In Example 22, the beginning points of Ostinato Patterns 3, 4, and 5 coincide again on the seventh beat (one quarter note per beat).[38] Unlike Example 21, the singer in Example 22 does not participate in isorhythmic overlap.

Modal and Tonal Ambiguities

Modal and tonal ambiguities occur when a listener hears "a combination of two musical patterns" in more than one mode or key.[39] A melodic line outlining an interval smaller than a sixth, and the doubling of this melodic line a perfect fifth below create modal and tonal ambiguities. For example, in Figure 13 of Glass's *Music in Fifths*, a listener can perceive this pattern in four keys and one mode (Example 23).[40] In Example 23, the top line that outlines a fifth can be in both C minor and E♭ major; the bottom line, which doubles the top line a perfect fifth below, can be in F minor and E♭ major; and the combination of both lines forms F-Dorian mode.[41]

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37. Also see the Section "The Birth of the Scientist's Daughter" in Chapter 5 for a more detailed discussion on the relations among loops, loop breakers, and the vocal parts.

38. Kyle Gann perceives the syncopating 3/4 meter in Ostinato Pattern 4 as 6/8. See Gann, "Midtown Avant-Gardist: Philip Glass Sails Columbus into a Clash of Keys and Cultures, October 27, 1992," in *Music Downtown: Writings from the Village Voice* (Berkeley and Los Angeles: University of California Press, 2006), 30.

39. Potter, *Four Musical Minimalists*, 292.

40. The score excerpt in Example 23 is from Example 4.6a in Potter, *Four Musical Minimalists*, 293. Figure 13 has more than one iteration, but Potter does not specify how many iterations Figure 13 should have. Potter's figure is equivalent to a rehearsal number.

41. Potter, *Four Musical Minimalists*, 292.

Example 24 illustrates a moment of modal and tonal ambiguities in *The Voyage*.[42] Each reiterating pattern contains an octachord and a hexachord in a two-part texture. An analyst can hear the top line in A minor, C major, Aeolian in the octachord with A4 as its final, and Hypodorian in the hexachord with D5 as its final; and the bottom line, which doubles the top line a perfect fourth below, in Phrygian (E4 as final), and Hypoaeolian (A4 as final). The combination of both lines forms Phrygian mode.

Musical Expressions

Directionless and Aimless

The mixture of additive and subtractive processes in Glass's *Strung Out* (Example 20) makes some listeners feel directionless since these processes "lack qualities of development [and] climax."[43] Throughout the piece, the additive and subtractive processes revolve around the dyads and trichords. These processes do not move to another compositional device, and do not lead to a climax. Other listeners feel aimless when listening to these freewheeling processes.[44] They cannot predict when an addition or a subtraction will begin or end.

In *The Voyage*, the permeating loops, optional partial loops and loop breakers in the orchestral parts provide senses of directionless and aimless. The orchestral parts of the opera revolve around these devices freely. The listeners cannot predict when loop breakers will terminate or interrupt loops.

42. Also see the Section "The Commander's Complaint and the Second Mate's Regret" in Chapter 5 for a more detailed discussion on the relations among loops, loop breakers, and the vocal parts.

43. Schwartz and Godfrey, *Music since 1945*, 325.

44. Potter, *Four Minimalists*, 272.

Finger Exercises for the Piano

Glass's compositional devices in *Music in Fifths* and *Music in Contrary Motion* (1969) sound like finger exercises for the piano. Michael Nyman calls the stepwise movements in Glass's *Music in Fifths* "five-finger exercises."[45] A comparison between Figure 13 from *Music in Fifths* (Example 23) and Exercise 10 from Ferdinand Beyer's "Exercises in Touch for the Right Hand" in *Vorschule im Klavierspiel* (Example 25) proves Nyman's statement.[46] Figure 13 in Example 23 may originate from the first two measures from Example 25. A listener also hears five-finger exercises in *The Voyage* (Example 24).

Beyer's other finger exercises are also audible in *Music in Contrary Motion* (Examples 26 and 27). In Example 26, Figure 1 from *Music in Contrary Motion* contains two tetrachords and four pentachords.[47] Example 27 shows three exercises from Beyer's "Exercises for Both Hands Together."[48] The two tetrachords in Example 26 come from the first two measures of Exercise 4 in Example 27. Exercises 10 and 11 in Example 27 become the building blocks for the four pentachords in Example 26.

Ironic Homage to Early Western Music History

Parts of Glass's compositional development reflect an "ironic homage to [early] Western musical history's expansion from plainchant to organum."[49] In an interview conducted by Keith Potter and Dave Smith, Glass told them that his compositional development from *Two Pages*

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45. Michael Nyman, *Experimental Music: Cage and Beyond*, 2nd ed, (New York: Cambridge University Press), 128.

46. Example 25 is from Ferdinand Beyer, "Exercises in Touch for the Right Hand," in *Vorschule im Klavierspiel*, ed. Adolf Ruthardt (Leipzig: Edition Peters, 1895), 8. William Scharfenberg translated the title *Vorschule im Klavierspiel* into *Elementary Instruction Book for the Pianoforte*. See Ferdinand Beyer, *Elementary Instruction Book for the Pianoforte*, ed. William Scharfenberg (New York: G. Schirmer, 1919), 1.

47. The score excerpt in Example 26 is from Example 4.7 in Potter, *Four Musical Minimalists*, 294.

48. Example 27 is from Beyer, "Exercises for Both Hands Together," in *Vorschule*, 9.

49. Potter, *Four Minimalists*, 294.

(February, 1969), *Music in Fifths* (June, 1969), to *Music in Contrary Motion* (July, 1969) was an attempt to trace the progress of musical history by making musical jokes.[50] Some of these musical jokes are still audible in *The Voyage.* Glass conveys senses of irony in these compositions by extracting and modifying musical elements from the religious contexts of plainchants and organum. As a result, Glass's compositions sound like spoofs of plainchant and organum.

Plainchants from the early Middle Ages feature reiterations of the same note and the unison texture. For instance, in a doxology from "Tones of the Verse: 'Gloria Patri' at the Introit of the Mass," the chant melody is sung in unison in Mixolydian mode with the reiterating reciting tone D4 (Example 28).[51] The melodic line in Figures 4 to 7 from *Two Pages* (Example 18) sounds like a textless instrumental loose imitation of Example 28 because in Example 18 Glass only keeps the concept of reiteration but not the actual reiterating material from the chant melody in Example 28.

Glass's *Music in Fifths* (Example 23) resembles the parallel fifths in parallel organum from the second half of the ninth century (Example 29).[52] In Example 29, the organal voice doubles the principal chant melody a fifth below forming a series of parallel fifths. Similar to Example 29, a listener also hears parallel fifths in Example 23. Example 29 features five reiterations of the same dyad (G3 and D3), but Example 23 does not contain any adjacent iterations of the same dyad.

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50. Keith Potter and Dave Smith, "Interview with Philip Glass," *Contact* 13 (Spring, 1976): 26.

51. The score excerpt in Example 28 is from The Benedictines of Solemes, ed., *The Liber Usualis: with Introduction and Rubrics in English* (Tournai, Belgium: Desclée & Co., 1961), 15–16. The translation of the text is from Burkholder, J. Peter and Claude V. Palisca, eds., "Gregorian Chant Mass: Mass for Christmas Day," in *Norton Anthology of Western Music*, vol. 1, *Ancient to Baroque*, 5th ed. (New York: W. W. Norton & Company, 2006), 10.

52. The score excerpt and text translation in Example 29 is from Burkholder and Palisca, eds., "Organa from *Musica enchiriadis*: *Parallel organum and mixed parallel and oblique organum*," in *Anthology*, 58.

Parallel fourths in *The Voyage* (Example 24) may originate from another organum technique—parallel organum at the fifth below with octave doublings (Example 30).[53] In Example 30, the center bass clef contains parallel fifths produced by principal voice (chant melody) and the organal voice. Two combinations of voices form parallel fourths—the octave doublings above the organal voice and the principal voice form parallel fourths, and the organal voice and the octave doublings below the principal voice. The parallel fourths in Example 24 can be the result of using one of the two combinations.

A listener may associate Glass's *Music in Contrary Motion* (Example 26) with the homo-rhythmic contrary motions in Pérotin's *Viderunt omnes* from late twelfth or early thirteenth century (Example 31).[54] When pitches in two vocal parts move in contrary motion and maintain the same rhythmic mode, they are in homo-rhythmic contrary motions. In Example 31, during a melismatic passage of the syllable "fe" from the word "*fetis*" (Latin for "hath"), a listener hears homo-rhythmic contrary motions in eight places—four in triplum and duplum (see notes surrounded by dotted rectangles), two in quadruplum and triplum (see notes surrounded by round rectangles), and two in quadruplum and duplem (see notes surrounded by groups containing two rectangles and a line).[55] The chant melody in the tenor vocal part is a long sustaining note.

53. The score excerpt and text translation in Example 30 is from Burkholder and Palisca, eds., "Organa," in *Anthology*, 58.

54. The score excerpt in Example 31 is from Burkholder and Palisca, eds., "Pérotin: *Viderunt omnes*," in *Anthology*, 87. Annotations in Example 31 are mine. The complete score of Pérotin: *Viderunt omnes* is from Edward H. Roesner ed., *Le Magnus Liber Organi de Notre-Dame de Paris*, vol. 1, *Les Quadrupla et Tripla de Paris* (Monaco: Éditions de l'Oiseau-Lyre, 1993), 1–13.

55. The editor Roesner provides measure numbers without bar lines in Pérotin's *Viderunt omnes*. Measure numbers in Example 31 are the result of transcribing the piece in 3/8 time, but Roesner does not include a time signature in the example. Adding bar lines to the example makes it easier for a reader to find a particular measure in the piece, but bar lines could also cause other problems (Example 32). In Example 32a, the rhythmic mode contains an eighth note followed by a dotted quarter note. After adding bar lines, a transcriber has to replace the dotted quarter note with a quarter note tied to an eighth note (Example 32b). The tie makes transcriptions inconvenient for a transcriber, and makes identifications of rhythmic modes difficult for some readers.

Glass's *Music in Contrary Motion* in Example 25 contains homo-rhythmic contrary motion in two instrumental parts without a chant melody.

Homage to Baroque Passacaglia

Glass's operas *Satyagraha* and *The Voyage* may be Glass's homage to Baroque Passacaglia, which features reiterating descending stepwise tetrachords in the bass line. For instance, Claudio Monteverdi's *Lamento della ninfa* contains reiterating tetrachords [A3, G3, F3, E3] (Example 33).[56] Example 33 shows four iterations of the tetrachord [A3, G3, F3, E3] in the bass clef of the basso continuo part (see ovals in the example). This tetrachord is performed throughout the rest of the piece.

In Act I Scene 1 of Glass's *Satyagraha*, John Richardson shows four iterations of the descending tetrachord [F2, E♭2, D♭2, C2] in four rehearsal marks—RM 1, RM 3, RM 9 and RM 11 (Example 34).[57] In Example 34, three additive processes occur in the second, third, and fourth iterations of the tetrachord in RM 3, RM 9, and RM 11.

In Act III Scene 2 of *The Voyage* (Example 35), the descending tetrachord [F3, E♭3, D3, C♯3] has only two iterations in mm. 3078–81 and mm. 3082–85, and only one additive process (see notes surrounded by dotted rectangles) in mm. 3082–85.[58]

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56. Claudio Monteverdi, "Lamento della ninfa SV 163" in *Tutte le Opere di Claudio Monteverdi*, vol. 1, ed. Gian Francesco Malipiero (Vienna: Universal Edition, 1929), Plate VIII.

57. The score excerpt in Example 34 is from "Example 11: *Satyagraha*, Act I, Scene I. Additive rhythms," in John Richardson, *Singing Archaeology: Philip Glass's Akhnaten* (Hanover, NH: University Press of New England, 1999), 62. Annotations in the example are Richardson's. Here, RM does not stand for reiterating material. RM stands for "Rehearsal Marks" which is equivalent to rehearsal numbers (Richardson, *Singing Archaeology*, 65).

58. Also see the Section "Commander's View of the Upcoming Voyage" in Chapter 6 for a more detailed discussion on the relations among loops, loop breakers, and the vocal parts.

CHAPTER 3

THEORY AND PRACTICE OF DRAMA IN *THE VOYAGE*

Joseph Kerman regards opera as a type of drama by musical articulation.[59] In spoken theaters, playwrights use words as a medium for drama; while in musical theaters, composers use vocal and instrumental music. Playwrights and composers present dramas to viewers through seven devices—plot, time, incident, presentation, representation, dialogue, and soliloquy. Knowing how these devices work in drama helps to investigate the relations among loops, loop breakers, and drama in Philip Glass's opera *The Voyage*.

Plot

According to drama theorist Elder Olson, a viewer can find up to four kinds of activities in a plot:

> (1) the activities of a single character in a single closed situation
> (2) the activities of two or more characters in a single closed situation
> (3) the activities of two or more characters in a series of situations centering about a single principal event
> (4) the activities of two or more characters in a series of situations involving more than one principal event.[60]

In the first kind of activities, a single closed situation refers to a situation when a character's actions, thoughts, and emotions "run [their] uninterrupted courses from [the] beginning to [the] end [of a scene]."[61] In Act I Scene 3 of the opera, when the female ancient alien Commander becomes the only member on board the space ship, she asks herself if she prefers to live with boredom or die, if she should stay or exit the ship, and what will happen if she exits the ship. She finally decides to leave the ship and join the natives of Earth. She determines her actions,

59. Joseph Kerman, *Opera as Drama* (New York: Vintage Books, 1959), 13.
60. Elder Olson, *Tragedy and the Theory of Drama*, 1961 (Detroit: Wayne State University Press), 41.
61. Ibid.

thoughts and emotions by herself without any external events and suggestions by other characters that can make her change her mind.

Similar to the first kind of activities, the second kind also occurs in a closed situation, but involving two or more characters. Under this circumstance, activities can only come from characters themselves, "and not from external interruption or intervention."[62] For instance, in Act I Scene 2 of the opera, after the space ship crashed, Commander orders her crew members—First Mate, Second Mate, and Ship's Doctor to take one of the directional crystals; and asks the First Mate to transport himself, the Second Mate, and Ship's Doctor to their preferred time periods and locations on Earth. All these actions and decisions only come from characters on board the space ship.

According to the definition of the third kind of activities, each act of the opera has its principal event. Act I revolves around the ancient alien's discovery of Earth; Act II centers upon Columbus's discovery of America; and Act III leads to the discovery of ancient aliens' planet by future humans.

The overall plot of the opera exhibits the fourth kind of activities in which the characters involve in five principal events. Acts I, II, and III unfold three kinds of discoveries (see the previous paragraph); the Prologue functions as a tribute to Stephen Hawking; and the Epilogue serves as a memorial service of Columbus.

Time

Drama theorist Manfred Pfister discovers two types of time in drama—actual performance time and fictional time.[63] The actual performance time is "the period of time it

62. Olson, *Tragedy*, 42.

63. Manfred Pfister, *The Theory and Analysis of Drama*, trans. John Halliday (New York: Cambridge University Press, 1988), 283–84.

takes to perform the play, minus the intervals [between acts and scenes]."[64] Based on this definition, the actual performance time of the opera's audio recording used for this research is two hours fifteen minutes and fifty-nine seconds.[65] There are three kinds of fictional time in drama. The primary fictional time refers to "total length of time covered by the action[s] presented directly on stage."[66] The secondary fictional time is "the fictional period that begins with [starting point] of the action presented on the stage, and finishes with the end of drama but includes any time that has been omitted in periods of chronologically hidden action[s]."[67] The tertiary fictional time denotes a fictional duration from the earliest time mentioned in the story "to either the end of the text or to the point in time mentioned in the play that is the furthest in the future."[68]

The primary fictional time of the opera equals the actual performance time because there are activities happening during the musical interlude between Act 1 Scene 2 and the conclusion of that scene.[69] If the musical interlude contained only music, the primary fictional time would be six minutes and six seconds shorter than the actual performance time.[70] In Act II, a listener notices that the differences between the primary and secondary fictional time. The primary fictional time of Act II is thirty-nine minutes and ten seconds, but the secondary fictional time is thirty-two days, which include both presented events (Columbus's first and thirty-second days of the journey) and omitted events (Columbus's journey from the second to the thirty-first day).[71]

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64. Pfister, *Theory and Analysis*, 283.
65. Glass, CD Booklet, 2.
66. Pfister, *Theory and Analysis*, 283.
67. Ibid.
68. Pfister, *Theory and Analysis*, 283–84.
69. According to the libretto in Glass, CD Booklet, 8, during the musical interlude, the Commander distributes the glowing crystals among members of the crew. Ship's Doctor arid Second Mate close their eyes and begin moving towards opposite sides of the stage. As they do, the pulsating chord begins to break up into its separate components, and the map of the galaxy fades away, replaced by images of the crew members' visions.
70. Glass, CD Booklet, 2.
71. Glass, CD Booklet, 4–5.

The tertiary fictional time of the opera is 52092 years from the earliest time mentioned, 50000 B.C., to the furthest in the future, 2092 A.D.[72] Viewers may find it amazing that they can witness a story that took 52092 years to unfold in a performance that lasts only two hours fifteen minutes and fifty-nine seconds.

Incident

In a dramatic work, "some incidents are immediate consequences of others;" and some are "remote consequences with many intervening incidents between them and their initiating cause."[73] For instance, in Act I Scene 2, First Mate adjusts the computer screen to show the location of the ancient aliens' home planet on a cosmos map.[74] The immediate consequence of adjusting the screen is the appearance of the planet on a map.[75] The crash of ancient alien's space ship in Act I Scene 1 leads to the future human's discovery of the alien's home planet in Act III Scene 1. The remote consequence of the crash is the future human's discovery. If the alien ship did not crash on Earth, Earth Twins 1 and 2 would not find the ship's directional crystals that would help them discover the alien's home planet.

Elder Olson distinguishes four types of incidents—essential, factorial, transitional, and ornamental incidents. Essential incidents are major incidents of the plot.[76] For instance, the crash of the alien ship in the opera is an essential incident. Factorial incidents are minor incidents "which provide the necessary causal conditions for the major ones."[77] A listener considers the bird singing near the end of Act II Scene 2 as a minor incident because the sound is from

72. Glass, CD Booklet, 6 and 13.
73. Olson, *Tragedy*, 64.
74. Glass, CD Booklet, 8.
75. See the Section "The Alien's Home Planet as a Blinking Point on the Screen" in Chapter 5 for a discussion of the relations among loops, loop breakers, and this incident.
76. Olson, *Tragedy*, 67.
77. Ibid.

offstage.[78] This minor incident gets Columbus's First Mate's attention and makes him to look and confirm that America is near.[79] Therefore, this minor incident becomes a factorial incident that leads to the major incident—the discovery of America. Transitional incidents effect continuity between scenes.[80] The Commander's distribution of the directional crystals in the musical interlude in Act I Scene 2 is a transitional incident that connects an earlier incident, the crash of the alien space ship, and a later incident, the departure of alien Commander's Second Mate.[81] Ornamental incidents such as dances and parades that are "simply pleasurable additions" to the plot.[82] In Act III Scene 2, dignitaries and politicians dance before a brass brand and a large enthusiastic crowd to see off the future space explorers.[83] The dignitaries and politicians can see off the explorers without the dance. The dance is an ornamental incident since the omission of the dance only makes the plot less pleasurable, but does not affect the understanding of the plot.

Presentation

A dramatist can present a story through scenic presentation and narrative mediation.[84] During a scenic presentation, viewers can interpret events that are presented in concrete visual form without further verbal explanation by actors.[85] In the opening of Act III Scene 1, according to the libretto, a viewer sees the following:

> The stage is split into two parts. [One] is a space station in our solar system, commanded by a set of twins, [Space Twins 1 and 2]. Behind them, a screen scans various sectors of the universe. The other half is a research laboratory on earth where a set of [twin archeologists, Earth Twins 1 and 2,] meet. [They are] carrying two of the glowing

78. Glass, CD Booklet, 12.
79. Ibid.
80. Olson, *Tragedy*, 68.
81. Glass, CD Booklet, 8.
82. Olson, *Tragedy*, 69.
83. Glass, CD Booklet, 5.
84. Pfister, *Theory and Analysis*, 204.
85. Ibid.

crystals we saw in Act I. Each of the crystals emits a particular frequency.[86]

This is a visual presentation showing what Space Twins and the Earth Twins are doing in the space station and in the lab on earth. The characters do not need to convey these information to a viewer by singing. The presentation saves time and helps to move the story forward.

Narrative mediation "[relies] on a report whose purely verbal quality makes it much less vivid and objective."[87] In Act I Scene 1, when the space ship is going out of control, the Commander expresses her fear metaphorically by singing the following:

> The beast rears its ugly head
> And smiles, and licks its chops
> And lies on the ground, tongue extended, to wait
> For the dead.[88]

Without any visual aid, a listener knows the beast's conditions from the only source—the Commander's words. With the visual aid, viewers can see a direct and vivid presentation of the beast, and can judge the beast's degree of ugliness and terribleness by themselves.

Representation

Dramatic representations involve the use of acoustic and visual codes.[89] "The dominant acoustic code is usually language," but a dramatist may accompany or replace it with "non-verbal acoustic codes, such as realistic noises, conventionalized sound effects (such as thunder, bells, etc.), and music."[90] Near the end of Act II Scene 2, bird singing from the offstage prerecorded audio tape signifies that land is near.[91] Traditionally, composers use musical elements such as melodies, rhythms, chords, textures, timbres, and dynamics as non-verbal

86. Glass, CD Booklet, 13.
87. Pfister, *Theory and Analysis*, 204.
88. Glass, CD Booklet, 7.
89. Pfister, *Theory and Analysis*, 7.
90. Ibid.
91. Glass, CD Booklet, 12. Also see the Section "Incident" from this chapter regarding the nature of the bird singing incident.

acoustic codes (see Chapter 1). In addition to these traditional elements, loops and loop breakers become a new source for non-verbal acoustic codes of this opera (see Chapter 1 and Chapter 4 for more details).

A dramatic work "presents itself as a structured complex visual codes," which "include stature and physiognomy of the actors, choreography and the grouping of characters, mime and gesture, mask, costume and properties, the size and form of the stage itself, the set ,and finally lighting."[92] Researchers cannot find the visual codes of the opera by listening to the audio recording, and reading the score and libretto of the opera. Researchers could find out how these visual codes work, if they had access to a live performance, a video recording, or a stage direction of the opera. However, in a few nineteenth-century operas, an analyst can find the instructions of gestures written in the score. In Daniel Auber's 1828 opera *La Muette de Portici* (*The Mute Girl of Portici*), stage directions such as gestures of a singer are "always carefully positioned in the score to correspond exactly with the musical cues."[93] The music of *La Muette de Portici* follows a singer's gesture closely so the audience knows the exact starting and ending points of gestures in music.

Dialogue

Dialogues connect "(1) a question [to] an answer or refusal to answer; (2) an imperative [to] an expression of the willingness or unwillingness to carry it out; (3) a piece of information [to] the positive or negative reaction to it; and (4) a statement [to] the confirmation, negation or

92. Pfister, *Theory and Analysis*, 7 and 9.

93. Mary Ann Smart, *Minomania: Music and Gesture in Nineteenth-Century Opera* (Berkeley and Los Angeles: University of California Press, 2004), 48.

qualification of the statement."[94] In Act II Scene 2, the following dialogue between Columbus and Queen Isabella exemplifies the first type of dialogue:

> COLUMBUS: Do you promise me, oh blessed one,
> Riches and governance,
> And most of all,
> That I further the kingdom of God?
> ISABELLA: Yes, I so swear.[95]

In the above dialogue, Isabella's utterance is an answer to Columbus's question.

A dialogue between Isabella and Columbus in Act III Epilogue exemplifies the second type of dialogue:

> ISABELLA: So, Cristobal, come
> Embrace me!
> With this, your final breath
> Come to my bed
> Unzip me, defile me
> Judge yourself, and enter my world.
> COLUMBUS: Is it foolish to seek the mind of God
> If there may be no God?
> Is it futile to reach for order
> In a universe built upon chaos?
> Is it vanity to hope one day
> To know the designs of all things?
> Even the sad expanses of regretful human souls?[96]

Isabella demands Columbus to join her in bed.[97] He indirectly expresses unwillingness to carry out her imperative by asking four questions that are unrelated to her request.

In a passage from Act I Scene 2, a listener hears the third and fourth types of dialogue. After seeing the ancient alien's home planet on the map, First Mate, Ship's Doctor, and Second Mate have the following conversation:

> FIRST MATE: As planets go, it was not so impressive.
> SHIP'S DOCTOR: It had an irregular orbit.
> SECOND MATE: The inhabitants played cards day and night.[98]

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94. Pfister, *Theory and Analysis*, 150.
95. Glass, CD Booklet, 12. Cristobal is Christopher Columbus's first name in Spanish.
96. Glass, CD Booklet, 16–17.
97. See the Section "The Ghost of Queen Isabella Seducing Columbus" in Chapter 6 for a discussion of the relations among loops, loop breakers, and Isabella's words.
98. Glass, CD Booklet, 8.

In the above dialogue, First Mate states that their home planet was not as impressive as other planets. First Mate's statement matches one of the criteria of the third type, which is a negative reaction to a piece of information. Ship's doctor's and Second Mate's responses to First Mate confirm that their home planet was not so impressive because of its irregular orbit and the laziness of its inhabitants.[99]

In a dialogue, one character can also clarify ambiguities in another character's utterance.[100] In Act I Scene 1, when the ancient alien's space ship is about to crash, Commander clarifies ambiguity in First Mate's utterance:

> FIRST MATE: Commander, there is a planet
> Where conditions are proper
> COMMANDER: For death?
> FIRST MATE: For life.[101]

First Mate's answer to Commander's question completes First Mate's first utterance in this dialogue. Without the Commander's utterance, some listeners may think that First Mate's first utterance is incomplete. On the other hand, after this dialogue, a listener knows that Commander is pessimistic about the space ship's condition.

Soliloquy

A soliloquy occurs when a character becomes alone on the stage, imagines being alone, or ignores the presence of other figures.[102] After the departures of Second Mate, First Mate, and Ship's Doctor, a listener hears the first type of soliloquy in the first half of Act I Scene 3, in

99. See the Section "The Alien's Home Planet" in Chapter 5 for a more detailed discussion on the relations among loops, loop breakers, and the singers.

100. Olson, *Tragedy*, 110.

101. Glass, CD Booklet, 7.

102. Pfister, *Theory and Analysis*, 127.

which Commander asks herself whether she should commit suicide or exit the space ship.[103] A viewer cannot find an example of the second type of soliloquy in the opera.

In most of Act I Scene 1, Commander, Second Mate, First Mate, and Ship's Doctor talks to themselves and keeps ignoring each other. Commander complains about the faulty equipment, Second Mate recalls his miserable childhood, First Mate looks up information of earth at the space ship's computer, and Ship's Doctor recalls her garden and children at springtime.[104] All these are examples of the third type of soliloquy. The only dialogue is between the Commander and First Mate at the end of the scene when the space ship is about to crash (see the previous Section "Dialogue").[105]

103. Glass, CD Booklet, 9. Also see the Section "The Commander's Decisions to stay on Earth" from Chapter 5.

104. Glass, CD Booklet, 6–7.

105. Glass, CD Booklet, 7.

CHAPTER 4

RESEARCH METHOD

The researcher explores the musical and dramatic functions of loops and loop breakers in Philip Glass's opera *The Voyage* in four stages—preparation, analyses of musical functions, analyses of dramatic functions, and assessment.

Preparation

An analyst takes six steps to prepare for the analyses of musical and dramatic functions.

Step 1: Learn Glass's Compositional Devices

In *The Voyage*, Glass often reuses compositional devices from his earlier works (see Chapter 2). Knowing the structures and expressions of these devices gives the analyst some preliminary ideas about Glass's musical language in the opera before reading the score and libretto.

Step 2: Read the Libretto and Score, and Listen to the Audio Recording

These three activities provide an analyst some general ideas about the music and drama of the opera. The analyst learns from the libretto that the opera contains three main stories—ancient aliens' discovery of Earth, Columbus's discovery of America, and the future humans' discovery of the ancient aliens' home planet. After reading the score and listening to the audio recording, the analyst knows that orchestral parts contain both reiterating materials (RMs) and non-reiterating materials (NRMs); solo singers do not double orchestral RMs and NRMs; and

choir singers perform RMs and NRMs when Glass uses the textless choir as instruments.[106] These ideas help to shape the musical and dramatic functions of loops and loop breakers in the opera.

Step 3: Convert RMs and NRMs into Loops, Partial Loops, and Loop Breakers

In the Section "Statement of Problem" from Chapter 1, an analyst realized that distinguishing NRMs from RMs does not illustrate the relations among them in successions. Converting RMs and RMs into loops, partial loops, and loop breakers can solve this problem. Before converting RMs to loops, an analyst should review the definition and invalidation of loops (see the Section "Definitions of Terms" from Chapter 1). An analyst should also review the definitions of loops and loop breakers before converting NRMs to partial loops and loop breakers (see the Section "Definitions of Terms" from Chapter 1).

Step 4: Know the Five Common Successions of Loops and Loop Breakers

A listener can only perceive the musical and dramatic functions of loops and loops breakers occurring in Successions 1, 2, 3, 4, and 5 (see the Section "Statement of the Problem" from Chapter 1). The Section "Definitions of Terms" from Chapter 1 and the Appendix show the definitions and musical illustrations of these five successions.

Step 5: Locate Loops and Loop Breakers in the Score

In the following four cases, some analysts may not be able to locate loops and loop breakers in the actual examples from the opera because of the complex multilayer designs and

106. See Chapter 1 for more information about the libretto, score, and audio recording.

lengthiness. To help these analysts, I present these four cases in the following four hypothetical examples containing fewer instrumental parts, and shorter loops, partial loops and loop breakers than the actual examples.

First iteration a loop may overlap with its second iteration, and the second iteration may overlap with its partial iteration (Example 36). In Example 36, the first iteration of a loop in Violin 1 overlaps with its second iteration in Violin 2 in the second measure, and the second iteration in Violin 2 overlaps with its partial iteration in Violin 1 in the third measure. The next loop in the fifth and sixth measures follows the loop breaker in the fourth measure.

Like overlapping loops, two successions may also overlap with each other (Example 37). Succession 5 overlaps with Succession 4 in the fourth measure of Example 37. The first and second iterations of the second loop in the fourth measure serve as the end of Succession 5 and the beginning of Succession 4.[107]

Orchestral parts contain loops and loop breakers, but a singer's melody does not (Example 38). In Example 38, the bass clef for the orchestra consists of two iterations of a loop, a partial iteration of a loop, a loop breaker, and two iterations of the next loop. In two complete iterations and one partial iteration of loop from the first three measures, a listener hears parallel fourths that sound like *parallel organum*, which is one of Glass's musical language in the opera (See Chapter 2). The treble clef contains the singer's non-reiterating melody, in which a listener cannot find a loop and a loop breaker.

Example 39 contains three layers of material—the treble clef for a singer, the treble clef for the orchestra, and the bass clef also for the orchestra. The singer's melody contains no loop and loop breaker. Below the singer's melody, material without loops and loop breakers in the

107. See the Appendix for Successions 4 and 5.

orchestral treble clef functions as harmonic support to the singer's melody. The bass clef for the orchestra at the bottom contains two iterations of a loop, a partial iteration of a loop, a loop breaker, and the next loop.

Step 6: Score Reduction

The goal of score reduction is to show examples of loops and loop breakers from the opera in a vocal score, which is easier to read than a full orchestral score. The following shows the criteria for score reduction.

Arrangement of vocal and instrumental parts. In a score reduction excerpt in the dissertation, the parts from top to bottom include—a group of staves for solo singers and choir, a piano staff for all melodic instruments, and a group of percussion staves if the excerpt contains unpitched percussion instruments. When there are no spaces in the piano staff for melodic instruments, the researcher puts staves for these instruments between the vocal staves and piano staff.

Transposing instruments. The researcher types transposed pitches of transposing instruments into the score reduction. For instance, the pitch C4 of Clarinets in B♭ in the original orchestral score becomes B♭4 in the reduction. As a result, the key signatures for transposing and non-transposing instruments are the same.

Instrument names before staves. When an example contains the same group of instruments in all systems, the researcher lists instrument names before the staves in the first system. If a change of instrumentation occurred at the beginning of the second system, the researcher would put instrument names before the staves of the second system. Instrument names above and below staves of a measure indicate that the change of instrumentation occurs in a place other than the beginning of a system. If all melodic instruments constitute successions of

loops and loop breakers, an analyst sees the word “melodic instruments” placed in front of the piano staff. The researcher always provides names of percussion instruments (such as Bass Drum, Cymbal, and Triangle) in front of percussion staves. When a staff contains two groups of instruments, the researcher adds the words “top” and “bottom” in front of each group. Stems go up in the top group, and down in the bottom group.

A check mark (✓) before a group of instrument names. In a musical example, a check mark in front of a group of instrument names shows the instruments used in successions of loops and loop breakers. When an analyst sees a check mark placed before instrument names in the top group of the staff, instruments in the top group form successions of loops and loop breakers, but instruments in the bottom do not. Check marks placed only in the first system of a musical example indicate that a listener hears successions in the same group of instruments throughout the example. Check marks after the first system indicate changes of instrument groups for successions in an example.

No check mark (✓) before all groups of instrument names. When a musical example does not contain any check mark, all melodic and percussion instruments constitute successions of loops and loop breakers throughout the example.

Analyses of Musical Functions

Expectations of Norms

Musical functions of loops and loop breakers in the opera concern a listener’s various expectations to the creation, sustaining, departure, and return to the norm. Reiterating material, a loop, draws attention by reemphasizing identical material. Robert Fink associates multiple iterations of the same musical materials with multiple iterations of the same stimulus in

advertisements. According to Fink, advertising requires "multiple iterations of the same stimulus to produce a rising curve of attention, interest, and desire—leading, ultimately, to a successful transaction at the point of sale." Repetitions in ads "coincided with the 1960s rise of repetitive music [in minimalism]."[108]

After two iterations, a loop becomes a norm for a listener. Non-reiterating material, functions as a loop breaker when placed after complete iteration(s) of a loop or a partial iteration of a loop. A loop breaker elevates a listener's attention by challenging the expectation to sustain the norm created by a loop, and by arousing curiosity about materials after the loop breaker. The elevated attention during a loop breaker can be directed to a new loop (a departure from the norm), or redirected to the previous loop (a return to the norm).

The elevated attention caused by a loop breaker functions like Joshua Banks Mailman's idea of an indeterminacy that creates suspense in a narrative.[109] If a succession of loops and loop breakers functioned as a narrative, a loop breaker would become an indeterminacy in a narrative. A listener consider a loop breaker an indeterminacy because a loop breaker can occur after complete iteration(s) of a loop or a partial iteration of a loop, and can lead to a new loop or the previously interrupted loop. The indeterminacy of a loop breaker in successions of loops and loop breakers creates suspense. The suspense becomes dramatically functional if a listener associates the indeterminacy of a loop breaker with dramatic contents.

108. Fink, "The Media Sublime: Minimalism, Advertising, and Television," in *Repeating Ourselves: American Minimal Music as Cultural Practice* (Los Angeles: University of California Press, 2005), 121.

109. Joshua Banks Mailman, "Agency, Determinism, Focal Time Frames, and Processive Minimalist Music," in *Music and Narrative since 1900*, ed. Michael L. Klein and Nicholas Reyland (Bloomington: Indiana University Press, 2013), 125–43.

Structural Gaps

An analyst can apply Leonard B. Meyer's theories of *structural gaps* to construct the musical functions in loops and loop breakers since scholars have successfully applied Meyer's theories to analyses of western tonal music within and beyond the common practice era, and to disciplines other than music. Matthew M. Lavy notices that Meyer's theories only "concern [themselves] with emotional responses to structural characteristics of Western tonal music," and are "not generalizable enough to embrace other musical genres."[110] Contrary to Lavy's observation, Jean-Jacques Nattiez suggests that not only analysts, historians, and psychologists of music but also ethnomusicologists and specialists of jazz and popular music should study Meyer's work.[111] Nattiez regards Meyer as one of the pioneers in the "cognitive psychology of music," and "one of the first to establish links between musicology and social sciences."[112] Renée Cox Lorraine claims that scholars can connect elements of tendencies and inhibitions in Meyer's theories to studies in "cultural and political processes, philosophy, history, literature, sociology, psychology, mathematics, and physics."[113]

An analyst can relate the concept of expectations in the successions of loops and loop breakers to Meyer's concept of *structural gap*. Meyer claims that a broken temporal process causes a structural gap.[114] The broken process "may arouse the keenest expectation," which is

110. Matthew M. Lavy, "What Music Psychology is Telling Us about Emotion and Why It Can't Yet Tell Us More: A Need for Empirical and Theoretical Innovation," in *The Music Practitioner: Research for the Music Performer, Teacher and Listener*, ed. Jane W. Davidson (Burlington, VT: Ashgate, 2004), 324–25.

111. Jean-Jacques Nattiez, "Leonard B. Meyer (1918–2007)," *Musicæ scientiæ: The Journal of the European Society for the Cognitive Sciences of Music* 12, no. 1 (Spring 2008): V.

112. Nattiez, "Leonard B. Meyer (1918–2007)," IV.

113. Renée Cox Lorraine, *Music, Tendencies, and Inhibitions: Reflections on a Theory of Leonard Meyer* (Lanham, MD: Scarecrow Press, 2001), vii.

114. Leonard B. Meyer, *Emotion and Meaning in Music* (Chicago: The University Chicago Press, 1956), 131.

satisfied not by a continuation of the expected missing material, but by the restoration of the temporal line with new materials after the interruption.[115]

Successions 1 to 5 contain structural gaps, but materials after the structural gaps differ from succession to succession. An analyst can only apply Meyer's concept to three successions of loops and loop breakers. In Successions 1, 3, and 5, loop breakers lead to the next loops (see the Appendix). These successions match Meyer's concept of structural gaps because after the broken temporal process, the initiation of new material restores the temporal line. In Successions 2 and 4, contrary to Meyer's concept, the expectations are satisfied not by moving to the next loop, but by moving back to the interrupted loops from the beginning of the successions.

A listener's expectations vary among different successions. In Successions 1 to 4, a listener expects to hear all loops terminated or interrupted after two or more iterations (see the Appendix). Succession 5 challenges this expectation since loop breakers in these two successions terminate and interrupt loops before the loops' complete second iterations.

Meyer's Three Meanings in Music

Meyer's three meanings in music—*hypothetical meaning(s), evident meaning(s),* and *determinate meaning(s)*—help to determine whether non-reiterating materials within a succession function as a potential complete iteration of a loop, a potential partial iteration of a loop, or a potential loop breaker.

A listener finds *hypothetical meanings* in "the act of expectation," in which "probability relationships always involve the possibility of alternative consequences, a given stimulus invariably gives rise to several alternative hypothetical meanings." Before the perception of the

115. Ibid.

consequent material, the antecedent material contains several alternative hypothetical meanings. For instance, in Succession 1 in the Appendix, before hearing the consequent material in the third and fourth measures, the antecedent material in the second measure contains three alternative hypothetical meanings—(1) a potential complete third iteration of the loop from the first measure, (2) a potential partial iteration of the loop from the first measure, and (3) a potential loop breaker.[116] A listener can perceive the antecedent material in the second measure as three-fourths of a loop which has the potential to become a complete loop, as a partial loop followed by a loop breaker, or as a non-reiterating loop breaker that breaks a loop or leads to the next loop. Without the consequent material in the third and fourth measures, all three hypothetical meanings are possible.

Not all listeners can hear these three hypothetical meanings in Succession 1 in the Appendix. Some listeners need to acquire a level of listening competence through ear training that enables them to find the reiterating loop in the first measure, and to remember hearing it after the second measure is played. These listeners could find three hypothetical meanings only if they obtained sufficient listening competence.

Evident meanings "are those which are attributed to the antecedent gesture when the consequent becomes a physico-psychic fact, and when the relationship between the antecedent and consequent is perceived."[117] After hearing the consequent material in the third and fourth measures of Succession 1 in the Appendix, the three hypothetical meanings of the antecedent

116. In the first movement development section of Mozart's No. 17 Piano Concerto in G Major, K453, Jay Smith finds a scenario which is similar to Meyer's hypothetical meanings. Smith discovered that when hearing a chord pending for resolutions, a listener expects different possible resolutions of the chord. See Jay Smith, "'Appraisal Responses' to Surprising Events in Mozart's Viennese Piano Concertos" (conference paper, Texas Society for Music Theory 37th Annual Conference, February 28, 2015), 7–18.

117. Ibid.

material in the second measure transform into one evident meaning—a partial iteration of the loop from the first measure.

Determinate meanings "are those meanings which arise out of the relationships existing between hypothetical meanings, evident meanings, and the later stages of musical development. In other words, determinate meaning[s] [arise] only after the experience of the work is timeless in memory, [and] only when all the meanings which the stimulus has had in the particular experience are realized and their relationships [are] comprehended as fully as possible."[118] After perceiving all the relations among loops and loop breakers as five types of successions, a listener discovers the determinate meanings of loops and loop breakers.

When a listener perceives loops and loop breakers as functional compositional devices in music, they attract a listener's attention to not only the performance of music, but also the presentation of drama.

Analyses of Dramatic Functions

Successions of loops and loop breakers can convey information, because a listener is able to perceive "musical successions as story-like," and is able to "find something like actions, thoughts, and characters in [musical successions]."[119] The narratives of successions are "imagined and constructed by the listeners from functional objects."[120] In successions, loops and loop breakers become functional objects, when they function as wordless musical narrators, who can use music instead of words to convey information regarding a moment in the opera.

118. Meyer, *Emotion*, 38.
119. Fred Everett Maus, "Music as Narrative," *Indiana Theory Review* 12 (Spring-Fall, 1991): 6.
120. Jean-Jacques Nattiez, "Can One Speak of Narrativity in Music?" trans. Katharine Ellis, *Journal of the Royal Musical Association* 115, no. 2 (1990): 249.

Abbate states that music in operas has "moments of narration" in which a listener can hear "voices of commentators."[121] In Wagner's *Ring* cycle, a listener hears three narrating voices—"the words [sung by] the character, [the quality of] his or her singing voice, and the voices [of the orchestra] within the musical fabric of a given passage as a whole."[122] In Wotan's monologue from Wagner's *Ring* cycle, the orchestra becomes "the voice of the narrator," who "conveys information about a future event: that Siegfried will rescue Brünnhilde."[123] The orchestra, as the voice of the narrator, "knows the outcome of the plot," and provides a listener perspectives which the singers cannot express on the stage.[124]

The music in Glass's opera *The Voyage* also contains what Abbate identifies as narrating moments. At narrating moments, the orchestra as a narrator comments on words and activities by singers and non-singers. This dissertation focuses on moments when music (loops and loop breakers in the orchestra) functions a narrator. Abbate discovers that the orchestra as a narrator in *The Ring* tells the event ahead of the singers in the distant future of the opera. Unlike Abbate's concept, the orchestra in *The Voyage* depicts events but in the more immediate future of the opera. For example, loop breakers in *The Voyage* shadow words by singers, and foreshadow upcoming entrances and actions of singers and non-singers in the next loop.

Four Dramatic Functions

A succession of loops and loop breaker has four dramatic functions:

(1) Shadowing meanings of a singer's words in a sentence (Example 40).[125] In Example 40, the first and second iterations of a loop in the first and second measure represent the words

121. Abbate, *Unsung*, xi–xii.
122. Abbate, *Unsung*, 157. The voices of the orchestra refer to the instrumental parts of the orchestra.
123. Abbate, *Unsung*, 169.
124. Ibid.
125. See definition of the verb "shadow" in the Section "Definitions of Terms" in Chapter 1.

"The Voyage" in Succession 1.[126] The two iterations of a loop provide a sense of an ongoing voyage. The partial iteration in the third measure, and the loop breaker in the fourth measure accompany the words "is over." The partial iteration and the loop breaker imply that the voyage is over by terminating the loop. A listener can find examples of this function in narrative mediations such as dialogues and soliloquies (see Chapter 2).

(2) Announcing departure or entrance of a singer (Example 41). In Example 41, the short arrow at the beginning of the loop breaker in the second measure marks a singer's point of departure. At this point, the singer could stop singing and remain on the stage, or stop singing and exit the stage. The long arrow indicates a singer's point of entrance when an on-stage singer in the scene could resume singing, a new singer could enter the scene without singing, or a new non-singer could enter the scene to act. The loop breaker here could direct a listener's attention to the changes happening on the stage.

(3) Announcing non-singing activities (Examples 42). Non-singing activities by a singer or a non-singer can occur in two situation: (a) during the loop breaker indicated by a curly bracket, or (b) at the beginning of the next loop in Example 42. Possible non-singing activities include operating the spaceship's computer (see the Section "Incident" from Chapter 2, and the Section "The Alien's Planet as a Blinking Point on the Screen" from Chapter 5), preparing to leave the spaceship (see the Section "Soliloquy" from Chapter 2, and the Section "The Commander's Decision to Stay on Earth"), or transporting crew members off the spaceship (see the Section "The Second Mate's Version of the New World, His Departure and the First Mate's Wishes" from Chapter 5).

126. See the Appendix for a musical illustration of Succession 1.

In situation (a), if a singer was singing during the two iterations of the loop in the first measure, the loop breaker in the second measure could serve to redirect a listener's attention from a singer's words to the activities during a loop breaker. After the loop breaker, the next loop in the third measure moves the story forward. The loop breaker when identified as "abrupt shifts of material" has two functions—an indication of "cuts between stories or parts of a story," and an illustration of "strange, surprising events or actions within a continuing story."[127] The dramatic function of the loop breaker presented in situation (a) matches the second function of abrupt shifts of material.

In situation (b), the loop breaker in the second measure breaks the loop in the first measure, and leads to activities other than singing by a singer or a non-singer in the loop of the third measure. The short arrow in the third measure indicates the starting point of activities. The loop in the first measure is broken to attract a listener's attention while preparing a listener for activities other than singing by a singer or a non-singer in the next loop of the third measure.

(4) Directing a listener's attention to a specific word or phrase by a singer (Example 43). In Example 43, the first and second iterations of a loop in the first two measures represent the words "the voyage" in Succession 4.[128] By interrupting the two iterations of the loop, the loop breaker in the third measure draws attention to the word "will" after "the voyage." In the fourth and fifth measure, restoring the previously interrupted loop after the loop breaker signifies the word "continue." If the whole sentence "the voyage will continue" was placed entirely within iterations of a loop without any loop breaker, the words "will continue" might draw less attention from a listener.

127. Maus, "Music as Narrative," 33.
128. See the Appendix for a musical illustration of Succession 4.

Assessment

Before making a conclusion, the analyst should consider the following:

(1) Review the "Definition" Section from Chapter 1 to confirm that markings of loops, loop breakers, and successions in the score reduction are correct.

(2) Consult the "Limitation" Section from Chapter 1, if there are two or more analyses of loops, loop breakers, musical and dramatic functions. The section may help an analyst make a decision.

(3) Confirm that the analyses of musical and dramatic functions address all issues in the "Research Questions" Section from Chapter 1.

CHAPTER 5

ACT I

Chapter 5 focuses on analyses of thirteen moments from five parts of Act I—two moments in the Prologue, one in Scene 1, three in Scene 2, three in the Conclusion of Scene 2, and four in Scene 3. In these thirteen moments, the researcher introduces the kinds of musical and dramatic functions of loops and loop breakers to be discussed in the musical examples; tells a reader what the singers and non-singers are doing at the moment; locates the instruments forming successions of loops and loop breakers (see the Appendix for musical illustrations of Successions 1 to 5); identifies melodies, rhythms, or chords that turn into musically functional loops and loop breakers based on a listener's expectations (see the Section "Analyses of Musical Functions" from Chapter 4); and determines the dramatic functions of musical functional loops and loop breakers by examining the relations among music, dramatic devices based on the theory and practice of drama (see Chapter 3), singers' and non-singers' words and activities (see the Section "Analyses of Dramatic Functions" from Chapter 4).

Act I Prologue

The Prologue opens with a singer, the Scientist, seated in a wheelchair descending from the stars. The Scientist is inspired by the real life scientist Stephen Hawking.[129] The Scientist questions the purpose of space travel, recalls the moment of his daughter's birth, and expresses his idea of voyage. The prologue ends with a chorus asking nine questions about time and

129. Glass, CD Booklet, 3–4 and 6.

universe. This section focuses on the moments of the birth of the Scientist's daughter, and the Scientist's idea of voyage.

The Birth of the Scientist's Daughter

In mm. 207–238, rr. 40–47, a listener hears Succession 5 at the moment when the Scientist (sung by a tenor) recalls the emotions and feeling at the birth of his daughter (Example 44).[130] In this succession, a loop breaker that causes a partial loop by a change of chord directs a listener's attention to a singer's entrance (see the second dramatic function in the Section "Analyses of Dramatic Functions" from Chapter 4).

Violin I and II, Viola, Cello, and Double Bass, Harp, and Bass Drum form Loop 13, Loop Breaker 7, and Loop 14. A listener hears isorhythmic overlap by these instruments throughout the example.[131] Flutes, Clarinets in B♭, and Oboes do not contain any loop and loop breaker, and function as a mini interlude (mm. 215–24*1) between the two lines of Scientist's text, and a mini postlude (mm. 231–38) after the Scientist's text.[132]

A listener hears the Am^{6}_{4} chord in both m. 213 (the seventh measure of Loop 13's first iteration) and m. 221 (the seventh measure of Loop 13's second iteration). The AM^{6}_{4} chord in m. 222 of Loop Breaker 7 replaces the D♭M chord in the eighth measure of Loop 13 in m. 214 (compare Example 44 [pp. 115–18] and Figure 1 [p. 55]).[133]

Figure 1a illustrates a simplified arrhythmic voice leading analysis containing three half steps, zero whole steps, and one skip in the seventh and eighth measure of Loop 13 in mm. 213–

130. See the Appendix for a musical illustration of Succession 5.

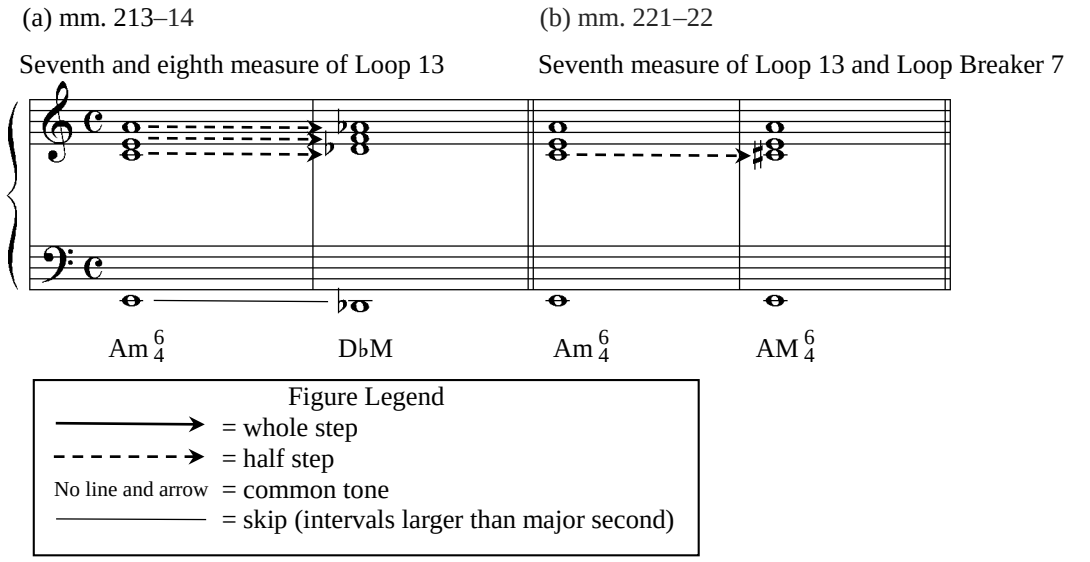
131. See the Section "Isorhythmic Overlap" from Chapter 2.

132. Two different layers of musical materials may overlap with each other in the opera (see the Section "*Step 5: Locate Loops and Loop Breakers in the Score*" from Chapter 4). Here, the ending of the mini interlude by Clarinets in B♭ overlaps with the beginning of Loop 14's first iteration in mm. 223–24*1.

133. See the Section "Definition of Terms" from Chapter 1 for a list of chord symbols used in this dissertation.

14. In Figure 1b, the chord in m. 222 of Loop Breaker 7 is approached by three common tones and one half step. Linear intervallic changes help a listener sense the emergence of a loop breaker.

Figure 1: Act I Prologue, comparison of (a) mm. 213–14 and (b) mm. 221–22



In Example 44, the introduction of Loop Breaker 7 ends Loop 13 before its complete second iteration. Loop Breaker 7, as a wordless musical narrator, announces the entrance of the Scientist in m. 223 (the first measure of Loop 14). During the two complete iterations of Loop 14, the Scientist's text "And for a moment, I felt my legs and limbs," and the melodies by flute and oboe are performed. There is no loop breaker that terminates Loop 14 in this example.

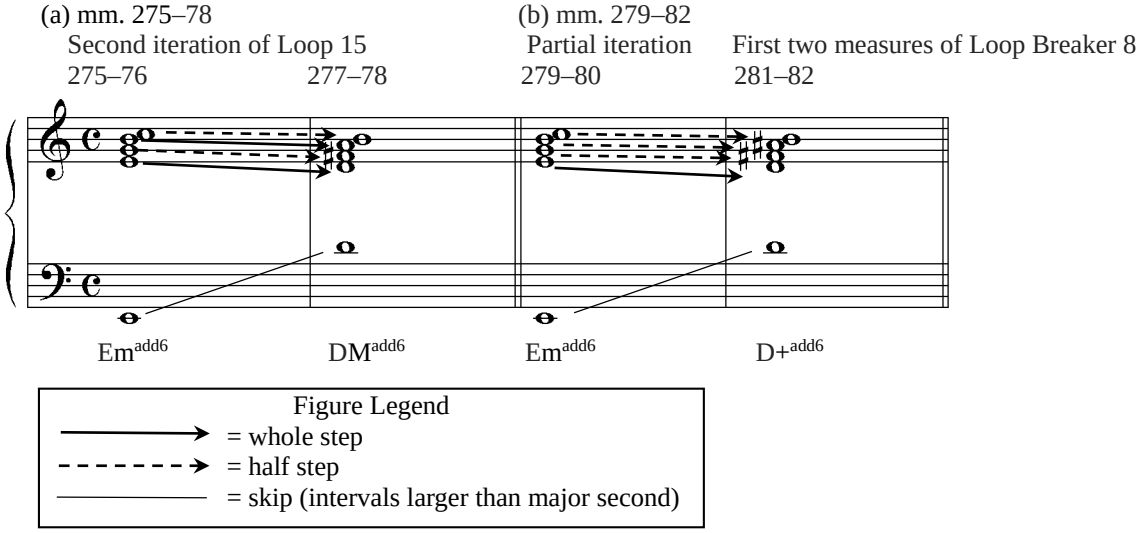
The Scientist's Idea of Voyage

Succession 1 accompanies the Scientist's words "The vision lies where the voyage lies there" in mm. 271–94, rr. 56–61 (Example 45). The loop breaker in this succession directs a listener's attention to the word "there" by changing the final chord in the loop's second iteration

(see the fourth dramatic function in the Section "Analyses of Dramatic Functions" from Chapter 4).

During the first and second iterations of Loop 15 (mm. 271–74 and mm. 275–78), a listener hears the chords DM^{add6} (D major triad with an added sixth) in mm. 273–74, and mm. 277–78. By replacing the chord DM^{add6} with the chord $D+^{add6}$ (D augmented triad with an added sixth) in mm. 281–82, a listener hears a partial iteration of Loop 15 caused by Loop Breaker 8 (compare Example 45 [pp. 119 –21] and Figure 2 [p. 56]).

Figure 2: Act I Prologue, comparison of (a) mm. 275–78 and (b) mm. 279–81



In Figure 2a, the second iteration of Loop 15 contains two downward half steps, two downward whole steps, and an upward skip. In Figure 2b, the chord in the first two measures of Loop Breaker 8 (mm. 281–82) changes the number of half steps from two to three, and the number of whole steps from two to one. The increasing number of half steps in Figure 2b makes the third iteration of Loop 15 partial, and marks the beginning of Loop Breaker 8.

Loop Breaker 8 makes a listener pay more attention to the word "there," the goal of the voyage. The loop breaker leads to two iterations of Loop 16 played by strings, harp, woodwinds,

and brass, in mm. 287–94. Cymbal and bass drum function as a rhythmic accompaniment to the Scientist, Loop Breaker 8, and Loop 16.

Act I Scene 1

Commander's and First Mate's Complaints and Second Mate's Regret

Succession 5 in Example 46 (mm. 403–18, rr. 9–12) as a wordless musical narrator shadows the meanings of Commander's word "dead" and Second Mate's sentence "I should have studied law" by introducing a chord changing loop breaker that makes a loop partial, and leads to a new loop. The loop breaker also directs a listener's attention to First Mate's words "mess hall." The vocal melodies exhibits a soliloquy caused by a singer's ignorance of other singers' presence (see the third type of soliloquy in the Section "Soliloquy" from Chapter 3).

Toward the end of the Earth's Ice Age about 50,000 B.C., an ancient alien's space ship goes out of control and rushes towards the solar system.[134] On board the ship, Commander complains about her limited freedom on the ship; First Mate hates having supper every night in the ship's mess hall; and Second Mate laments over the length of the voyage, and his poor choice of career.

Succession 5 begins with the first iteration of Loop 17 in mm. 403–10.[135] The A♭+6 chord (the first inversion of the A♭ augmented triad) of Loop Breaker 9 in m. 416 makes the

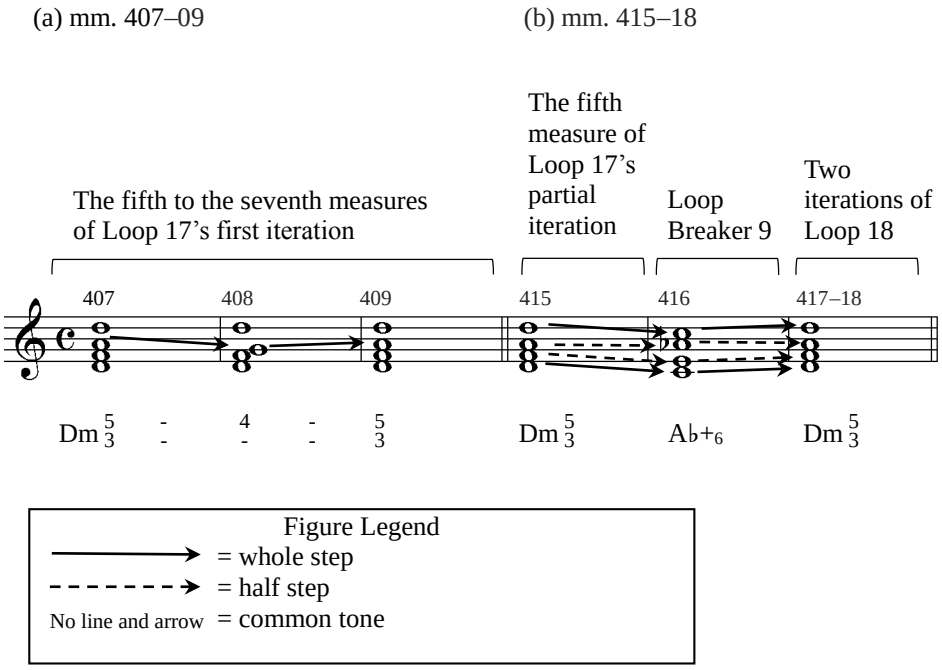
134. Earth has several ice ages. Scientists have various theories regarding the time when each ice age ends. Glass specifies the end of the ice age in this opera is around 50,000 B.C. See Glass, CD Booklet, 6.

135. In the upper treble clef of Loop 16, a listener hears modal and tonal ambiguities, finger exercises, and spoofs of parallel organum. See the Sections "Modal and Tonal Ambiguity," "Finger Exercises for the Piano," and "Ironic Homage to Early Western Music History" from Chapter 2.

second iteration of Loop 17 (mm. 411–15) partial. Two iterations of Loop 18 follow Loop Breaker 9 (compare Example 46 [pp. 122–23] and Figure 3 [p. 58]).[136]

In Figure 3a, the fifth to the seventh measure of Loop 17's first iteration contain linear common tones and whole steps. In Figure 3b, the introduction of Loop Breaker 9 in m. 416 eliminates all linear common tones, and adds linear half steps between m. 415 and m. 417.

Figure 3: Act I Scene 1, comparison of (a) mm. 407–09 and (b) mm. 415–18



In Example 46, Loop Breaker 9 makes Loop 17's second iteration partial, and leads to a new loop, Loop 18. The "death" of Loop 16 caused by Loop Breaker 9 foreshadows the meaning of Commander's word "dead" in m. 417. Loop Breaker 9, which accompanies the words "mess

136. A♭+6 stands for the first inversion of an A♭ augmented triad, not an A♭ triad with an added sixth. A♭M^{add6} and A♭m^{add6} denote an A♭ major triad with an added sixth, and A♭ minor triad with an added sixth, respectively. Also see a list of chord symbols in the Section "Definitions of Terms" from Chapter 1.

hall" in m.416 emphasizes the dining location that First Mate does not want to have supper anymore.

Loop Breaker 9 also signifies the Second Mate's regret of being a spaceship crew member instead of studying law. In mm. 413–15, Second Mate states that "I should have studied law." In m. 416, his regret is signified by a partial iteration of Loop 17 caused by Loop Breaker 9 in m. 416. The two iterations of Loop 18 (mm. 417–18) after Loop Breaker 9 confirm that Second Mate cannot return to pursue law anymore. If Loop 17 had two complete iterations without a loop breaker, the uninterrupted loop could signify Second Mate's success to pursue a career in law.

In mm. 410–17, Commander's, First Mate's, and Second Mate's three independent and overlapping melodic lines form the third type of soliloquy, in which singers begin singing their own words without listening and responding to other singers. The instrumental loops and loop breakers do not shadow the soliloquy by these three singers because the listener hears only one succession of loops and loop breaker (Succession 5) for all three singers. If there were three independent and overlapping successions for three singers, these three successions would contribute to the musical expression of soliloquy.

Act I Scene 2

The Ancient Alien's Home Planet as a Blinking Point on the Screen

The loop breaker that terminates the second iteration of a loop by reducing the number of instruments announces First Mate's non-singing activity (see the fourth dramatic function in "Analyses of Dramatic Functions" from Chapter 4), and functions as an immediate consequence of Commander's order (see the Section "Incident" from Chapter 3).

After the crash of the ancient alien's space ship on Earth at the end of Scene 1, Commander declares the end of their voyage in space, and asks the pilot (played by First Mate), a non-singer at the moment, to show their home planet on the computer screen to the Ship's Doctor, First Mate and Second Mate. The ancient alien's home planet appears as a blinking point in a corner of the screen.[137] These moments are accompanied by a pickup measure before Loop 19 (m. 568), two iterations of Loop 19 (mm. 569–77 and mm. 578–86) and Loop Breaker 10 (mm. 587–89) in Example 47.

A pickup measure (m. 568) before the first measure of Loop 19, and two iterations of Loop 19 (mm. 569–77 and mm. 578–86) accompany Commander's sung text. In the pickup measure before Loop 19 and the first iteration of Loop 19 (mm. 568–77), Commander announces that their days of wondering and floating in space are over.[138] In the second iteration of Loop 19 (mm. 578–86), Commander tells Ship's Doctor, First Mate, and Second Mate that they should keep their feet fixed to the soil (Earth), and Commander asks First Mate to show their home planet on the computer screen.

After the second iteration of Loop 19, in m. 587, the number of orchestral parts in Loop Breaker 10 (mm. 587–89) suddenly drops from four to one which ends the Commander's solo in the two iterations of Loop 19. Loop Breaker 10 redirects a listener's attention from Commander to First Mate. A viewer sees First Mate adjusted the computer screen followed by a blinking spot representing the ancient alien's home planet showing up in the corner of the screen. According to the libretto, the sound effect of each blinking is depicted by the three-note chord E, G, and B (an E minor triad) in mm. 588–89.[139]

137. The activities other than singing by singers and non-singers are written in the libretto only, not in the score. For activities at this moment, see Glass, CD Booklet, 8.

138. In the libretto printed in the CD booklet, the text says "The days of wandering" instead of "The days of wondering." See Glass, CD Booklet, 8.

139. Glass, CD Booklet, 8.

Loop Breaker 10 functions as an immediate consequence of Commander's order in the second iteration of Loop 19, which is First Mate's adjustment of the screen. The breaker that accompanies First Mate's action answers Commander's sung order by musical instruments, not by First Mate's sung words.

Loop Breaker 10 (mm. 587–89) leads to the two overlapping iterations of Loop 20 (mm. 590*1–93*2 and mm. 593*1–96*2) in the next dramatic moment, *The Ancient Alien's Home Planet* (see the next section).[140] Now, Succession 3 (mm. 569–96*2) contains two iterations of Loop 19 (mm. 569–77 and mm. 578–86), Loop Breaker 10 (mm. 587–89), and two iterations of Loop 20 (mm. 590*1–93*2 and mm. 593*1–96*2). The two iterations of Loop 20 functions as both the end of Succession 3 and the beginning of Succession 1 in mm. 590–601 (compare Figure 4 [p. 61] and Example 47 [pp. 124 –27]).[141]

Figure 4: Act I Scene 1, overlapping of Succession 3 and Succession 1

<table>
<tr><td colspan="6">Succession 3 (569–96*2)</td><td colspan="4">Succession 1 (590–601)</td></tr>
<tr><td>569–77</td><td>578–86</td><td>587–89</td><td colspan="5">590*1–93*2</td></tr>
<tr><td rowspan="2">First iteration of Loop 19</td><td rowspan="2">Second iteration of Loop 19</td><td rowspan="2">Loop Breaker 10</td><td rowspan="2">First iteration of Loop 20</td><td colspan="4">593*1–96*2</td></tr>
<tr><td rowspan="2">Second Iteration of Loop 20</td><td>596*1–97</td><td>598</td><td>599–601</td></tr>
<tr><td>Partial iteration of Loop 20</td><td>Loop Breaker 11</td><td>First and second iterations of Loop 21</td></tr>
</table>

140. The overlapping two iterations of Loop 19 is illustrated by solid lines and dotted lines in Example 48.
141. See the Section "*Step 5: Locate Loops and Loop Breakers in the Score*" from Chapter 4.

In Figure 4, Succession 3 (mm. 569–96*2) overlaps with the Succession 1 (mm. 590–601) in mm. 590*1–596*2, the two iterations of Loop 20. The last two beats in the second iteration of Loop 20 also overlaps with the first two beats of its partial iteration in mm. 596*1–*2 (see Example 47 for the markings of the overlapping loops and partial loop).[142] Two iterations of Loop 20 (mm. 590*1–93*2 and mm. 593*1–96*2), the partial iteration of Loop 20 (mm. 596*1–97), Loop Breaker 11 (m. 598), and two iterations of Loop 21 (mm. 599–601) become Succession 1 (mm. 590–601).

The next section *The Ancient Alien's Home Planet* discusses how Succession 1 shadows the conversation among First Mate, Ship's Doctor, and Second Mate.

The Ancient Alien's Home Planet

In this section, the two overlapping iterations of a loop foreshadow the meaning of the word "irregular," and a loop breaker causing a partial loop directs a listener's attention to the word "night." Two iterations of the same loop convey the Ship's Doctor's confirmation of First Mate's statement (see the "Dialogue" Section from Chapter 3).

After viewing their home planet on the screen, the ancient aliens First Mate, Ship's Doctor, and Second Mate begin to recall their home planet during Succession 1 in mm. 590–601 (Example 47).

In Example 47, during the first iteration of Loop 20 in mm. 589*4–92*1 (with First Mate's pickup measure in m. 589), First Mate describes their home planet as unimpressive. Ship's Doctor states that their home planet has an irregular orbit during the second iteration of Loop 20 (mm. 593*4–95*2). The word "irregular" in m. 594 is foreshadowed by the first

142. Ibid.

overlapping loops in the opera in mm. 593*1–*2, where the first iteration of Loop 20 overlaps with its second iteration. Loops before Loop 20 do not overlap, therefore, a listener regards the overlapping first and second iterations of Loop 20 as "irregular."[143]

Ship's Doctor's words "It had an irregular orbit" confirm First Mate's statement "As planets go it was not so impressive." The dialogue between these two singers matches the definition of the fourth type of dialogue in Chapter 3. A listener hears the sense of confirmation from two consecutive iterations of Loop 20 that accompany the melodies of Ship's Doctor and First Mate. The music would not convey the sense of confirmation, if there were no loops.

The partial iteration of Loop 20 (mm. 596*1–597), Loop Breaker 11 (m. 598) and two iterations of Loop 21 (mm. 599–601) elevate the dramatic tension. Loop Breaker 11 makes third iteration of Loop 20 a partial iteration (mm. 596*1–97), and attracts a listener's attention to Second Mate's word "night" in the sentence "The inhabitants played cards day and night" by the increase of the number of eighth notes in Loop 20 from nine to twelve (compare m. 595 and m. 598).

The following Loop 21 (mm. 599–601), a loop which is more dense than Loop 20, does not have long rests. In addition, Loop 21 has two additional layers of syncopated chords, and half note chords on top of the reiterating eighth notes (mm. 599–600). The lack of long rests and the thickened layers in Loop 21 contribute to the increasing dramatic tension from Loop 20 to Loop 21. The increasing tension foreshadows Commander's significant decision at the next moment when Commander asks the non-singers—Ships' Doctor, First Mate, and Second Mate—to take one of the space ship's directional crystals, which can bring them home in the future.

143. See the Section "Step 5: Locate Loops and Loop Breakers in the Score" from Chapter 4 for overlapping loops and loop breakers.

Visualizing the New World on Earth

The first loop breaker in this section attracts attention to the phrase "live in" by a subtractive process (see the Section "Subtraction Processes" from Chapter 2). The second loop breaker highlights the word "gravity" by changing rhythmic patterns.

After Commander's order, First Mate tells the crew members of the spaceship to visualize their own images of new world on Earth, and enter it, during Succession 4 (mm. 651–669 in Example 48).

In Example 48, the four iterations of Loop 22 (mm. 651–54, 655–58, 662–65, and 666–69) are found in the bass clef of the piano staff. In mm. 655–59, 663–64, 666–70, horns double most of First Mate's melodies an octave below. Horns in F are not part of Loop Breaker 12 (mm. 659–61), while all melodic and percussion instruments form Loop Breaker 13 (m. 670)

Loop Breaker 12 after the second iteration of Loop 22 directs a listener's attention to the phrase "live in" (m. 659) after the words "the world you would" (mm. 657–58) by changing the rhythmic figure from "3+3+2" to "3+3," which is a subtractive process. After the breaker, the restoration of the third iteration of Loop 22 in m. 662, gives a listener a hint that the First Mate has more to say after "imagine the world you would live in." This hint is confirmed by First Mate's words "Then enter it [the world you would live in]" in mm. 663–64. Loop Breaker 13 ends Succession 4 in m. 670, and highlights the last word "gravity" by changing the rhythmic pattern from "3+3+2" (m. 669) to "2+3+3" (m. 670).

Act I Scene 2 Conclusion

Second Mate's Wish and His Version of the New World

In this section, a loop breaker and the loop after it shadow the meaning of the phrase "with no hope of return" by preventing the return of the loop before the loop breaker.

In Scene 2, First Mate asks Second Mate Ship's Doctor to visualize their own versions of the new world on Earth. In Scene 2 Conclusion, Second Mate first shares his version with the crew in mm. 925–44, rr. 3–8, during Succession 1 (Example 49). Three iterations of Loop 23 (mm. 925–33), one partial iteration of Loop 23 (mm. 934*1–*5), Loop Breaker 14 (mm. 934*6–35), and three iterations of Loop 24 (mm. 936–44) form Succession 1.

A listener hears performers of Flutes, Celeste, Harp, and Violin I play three iterations of Loop 23, one partial iteration of Loop 23, and Loop Breaker 14. Performers of Oboes and Violin I play three iterations of Loop 24. During the three iterations of Loop 23, the non-reiterating Flutes, Clarinet in B♭, and Violin II function as harmonic accompaniments. The non-reiterating melodies by Bass Clarinet in B♭ and Bassoons function as contrapuntal supports to Loop 23, Loop Breaker 14, and Loop 24 in mm. 927, 930, 933, 935, 938, 941, and 944.

Second Mate's wish to escape his home "with no hope of return" is represented by Loop Breaker 14 (mm. 934–35) and Loop 24, which makes a possible fourth iteration of Loop 23 partial (mm. 934*1–5) and leads to Loop 24 starting in m. 936. Loop Breaker 14 and the new Loop 24 after the loop breaker shadows the meaning of "with no hope of return," because the previous Loop 23 does not return after the loop breaker. During the three iterations of Loop 24, Second Mate shares his version of the new world ruled by machines, and seeing his hand on the lever.

Second Mate's Version of the New World, His Departure and First Mate's Wishes

In Succession 2 (mm. 947–69) of Example 50, Loop Breaker 15 (mm. 955–60) signals Second Mate's departure, a non-singing activity, by making the melodic line of Loop 25 partial (mm. 955*1–*3).

After describing his version of the new world on Earth, Second Mate is transported to Europe during the worst of Industrial Revolution. First Mate's states his wishes after the departure of the Second Mate. In Example 50, these three moments are accompanied by Succession 2 (mm. 947–69), which consists of two iterations of Loop 25 (mm. 947–50 and 951–54), a partial iteration of Loop 25 (mm. 955*1–*3), Loop Breaker 15 (mm. 955–60), and three iterations of Loop 26 (mm. 961–63, 964–66, and 967–69).

Trumpets in B♭, Violin II, Oboes, Clarinets, and Violin I in the treble clef form two iterations of Loop 25 (mm. 947–50 and 951–54), while bassoons and bass clarinets in B♭ function as contrapuntal support to the melody of Loop 25. Second Mate describes his version of a world with a sky blackened by him in the two iterations of Loop 25. The introduction of Loop Breaker 15 in m. 955*4 makes mm. 955*1–*3 a partial iteration of Loop 25 (pitches surrounded by a dotted rectangle) by replacing the pitch A4 in m. 951*4 (the pitch surrounded by a rectangle) by D5 in m. 955*4 (the pitch surrounded by an oval).

During Loop Breaker 15 (mm. 955–60), Second Mate "disappears into an image of Europe during the worst of the Industrial Revolution." Second Mate's disappearance is a reference to the fictional transporting device used in the *Star Trek* media franchise including novels, comics, films, television series, and video games. When the device is activated, a person standing on the device first disappears, and then reappears at a new location. Loop Breaker 15 as a wordless musical narrator confirms the departure of Second Mate by terminating Loop 25, and preparing the entrance of Loop 26.

Three iterations of Loop 26 (mm. 961–63, 964–66, and 967–69) are found in Violin I, Violin II, and Celeste in the orchestral treble clef. Bassoons in the bass clef functions as a harmonic support to the First Mate. In the three iterations of Loop 26, First Mate states that all he ever wanted was to continue the voyage with vessel or without. His statement seems completed in m. 968, but later a listener discovers that he has more to say in Succession 3 (see mm. 970–82 in Example 50 and the next section).

First Mate's Departure, and Ship's Doctor's Wish

In Succession 3 (mm. 970–82) of Example 50, a change of melodic line in Loop Breaker 16 (mm. 973*7–*9) shadows First Mate's departure (a non-singing activity) by terminating the two iterations of Loop 27 (mm. 970–71 and 972–73*6).

The last two measures of Loop 26 in mm. 968–69 becomes the materials for Loop 27 starting in mm. 970–71 (Example 51).[144] The partial recycling of Loop 26 in Loop 27 is a continuation of First Mate's statement from the previous section.

In mm. 973*7–*9, the three eighth notes E4, F4, and F♯4 (see the notes surrounded by a round rectangle) that terminate the two iterations of Loop 27 become Loop Breaker 16. During the breaker, First Mate is "transported to a pavilion near top of a Tibetan mountain."[145] Unlike Second Mate, First Mate does not specify a particular location associated with any time period on Earth, and is transported to a seemly random location in an unknown time period.

The three iterations of Loop 28 (mm. 974–76, mm. 977–79, and mm. 980–82) after Loop Breaker 16 confirm the departure of First Mate, and direct a listener's attention to Ship's

144. An analyst could label Loop 27 as Loop 26a, if the analyst regarded Loop 27 as a variant of Loop 26. See the "Limitations" Section from Chapter 1.

145. The First Mate's transportation to Tibet is a reference to the *Star Trek* media franchise. See the discussion on the Second Mate's disappearance in the segment "The Second Mate's Version of the New World, His Departure and the First Mate's Wishes."

Doctor's wish to tell a story. Horns in F, Violin I, and Viola form the three iterations of Loop 28. Materials by Flutes, Clarinets in B♭, and Trumpets in B♭ function as harmonic supports to the Ship's Doctor's melody and the three iterations of Loop 27.

Act I Scene 3

In Act I Scene 3, Commander becomes the only member left in the spaceship. Commander refuses to settle on Earth first, but decides to stay later. Upon exiting the spaceship, she expresses concerns about the people on Earth and the issues about intimacy, love, and hate. The following sections explore these moments in the opera.

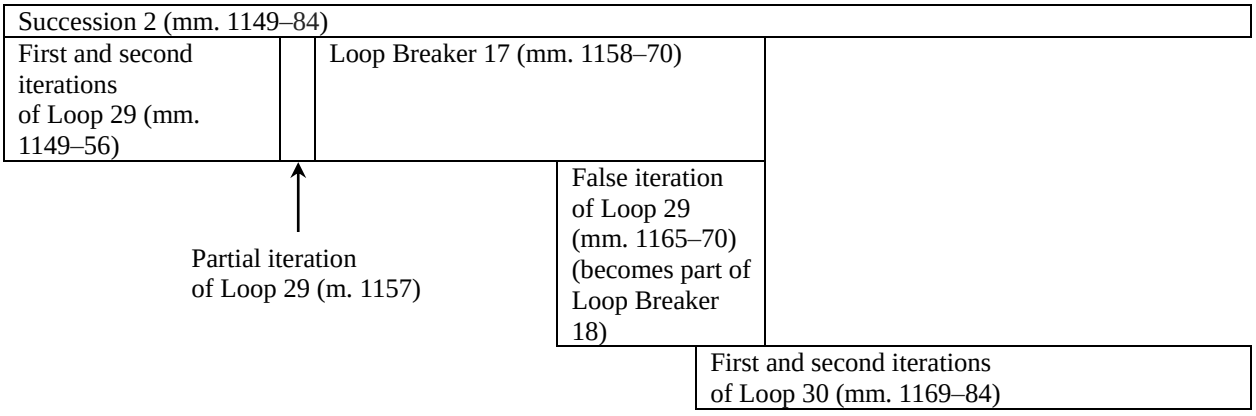
Commander's Unwillingness to Settle on Earth

In this section, the loop breaker directs a listener's attention to the words after "in my secret heart," and shadows the meaning of "change" by converting a partial iteration into a false iteration (see Point 4 in the Section "Limitations" from Chapter 1).

In mm. 1149–84, rr. 7–15, Succession 2 accompanies Commander's text, "In my secret heart, I would rather have died than live tethered to the change of the seasons. Ah…" (Example 51). Succession 2 consists of two iterations of Loop 29 (two iterations of mm. 1149–56), one partial iteration of Loop 29 (m. 1157), Loop Breaker 17 (mm. 1157–70) and two iterations of Loop 30 (two iterations of mm. 1169–84 (compare Example 51 [pp. 134–36] and Figure 5 [p. 69]). In Figure 5, the two iterations of Loop 29 and a partial iteration of Loop 29 lead to Loop Breaker 17. A listener first regards the last six measures of Loop Breaker 17 (mm. 1165–70) as a partial iteration of Loop 29. After hearing the two iterations of Loop 30, a listener considers the

last six measures of Loop Breaker 17 a false iteration of a loop within a loop breaker.[146] Loop Breaker 17 overlaps with Loop 30 in mm. 1169–70.

Figure 5: Succession 2 in mm. 1149–84



In Example 51, the Commander enters at the second iteration of m. 1155 (the seventh measure of Loop 29). Loop Breaker 17 (mm. 1157–68) causing a partial iteration of Loop 29 (m. 1157) directs a listener's attention to the words after "in my secret heart." The words "the change of seasons" are shadowed by the change of functions from a partial iteration to a false iteration of Loop 29 within Loop Breaker 17.

Commander's Decision to Stay on Earth

The loop breaker causing a partial loop by altering the melodic figuration shadows Commander's non-singing activity, her preparation to leave the space ship.

In Succession 1, Commander tells a story about her summer and her wish to travel in space in the past, and makes a decision to embrace the new life on Earth (Example 52). The first iteration of Loop 31 (mm. 1207–12) depicts Commander's endless repeating summer holiday in

146. See the "Limitations" Section from Chapter 1 for the definition of false iteration.

the past by multiple iterations of arpeggiated triads in mm. 1207–10 and reiterating E4-F4 and E3-F4 parallel octave figurations in mm. 1211–12. Commander continues to express her past wish of travelling in space by singing "kicking up her heels without touching the ground" in the second iteration of Loop 31 (mm. 1213–18). The C4-D4 and C3-D3 parallel octave figurations in mm. 1223–24 causing a partial iteration of Loop 31 (mm. 1219–22), and become the first two measures of Loop Breaker 18 (mm. 1223–26).

Loop Breaker 18 shadows Commander's preparation to exit the ship. Without returning to the previous Loop 31, the two iterations of Loop 32 in mm. 1229–30 confirm Commander's intention to leave the ship. Commander first expressed this intention in mm. 1218–22 by singing "So I will simply walk into the arms of whatever lies waiting."

Commander's Doubt about the People on Earth

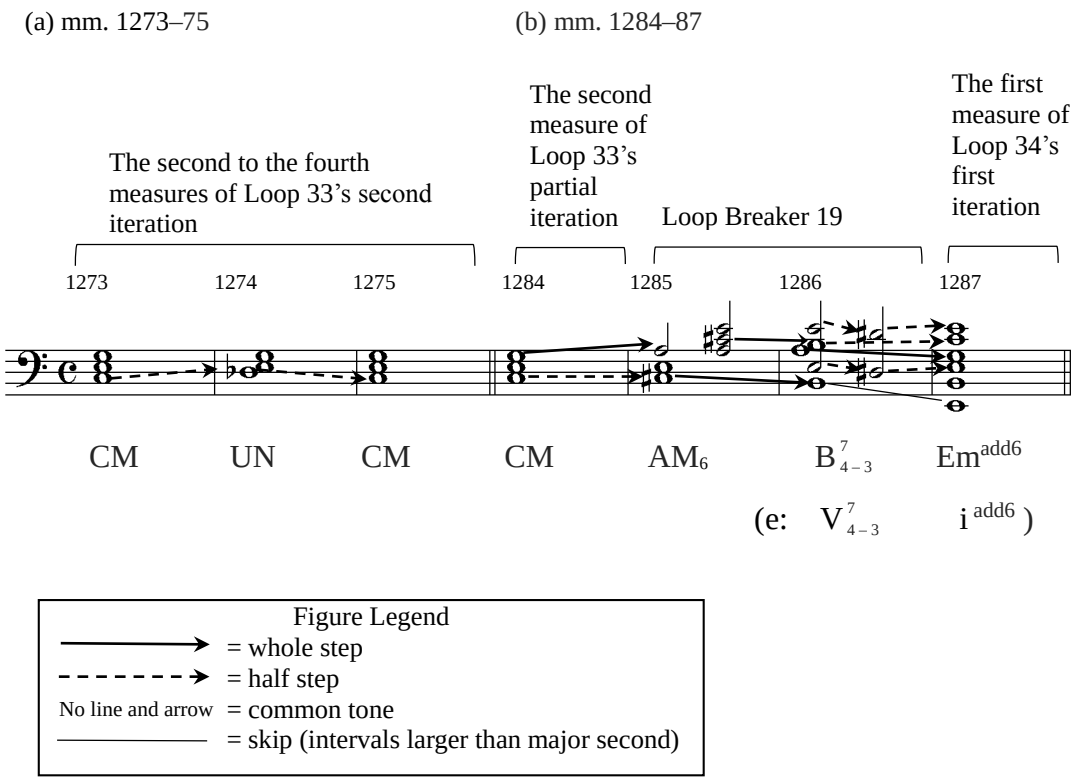
In this section, the loop breaker foreshadows the meaning of "shameful" by changing the last two chords of a loop.

Before exiting the ship, Commander begins to wonder what the people on Earth will want from her, what their belief will be, and what they will do to her. In mm. 1263–1302, rr. 31–39, Succession 1 shadows Commander's thoughts (Example 53). In the first iteration of Loop 33 (mm. 1263–72), Commander guesses that the people on Earth will want—potions, jewels and color TV. Commander continues to wonder if the Earthlings base their hopes in the book of the dead, mantra, or some relics in the second iteration of Loop 33 (mm. 1273–82).[147]

Loop Breaker 19 (mm. 1285–86) causes a two measure partial iteration of Loop 33 (compare Figure 6 [p. 71] and Example 53 [pp. 139–42]).

147. The word "montra" in the score should be "mantra," according to Glass, CD Booklet, 9.

Figure 6: Act I Scene 3, comparison of (a) mm. 1273–75 and (b) mm. 1284–87



In Figure 6a, mm. 1273–75 shows the half step motions (UN: upper neighbor note) in the bass line between two C major triads from the second to the fourth measures of Loop 33's second iteration. The AM_6 chord in Figure 6b replaces the half step motions in Figure 6a, and leads to a B_7 chord with a 4-3 suspension. After hearing m. 1287, a listener regards the B_7 chord in m. 1286 as a V_7 chord of E minor, which proceeds to an E minor tonic triad with an added sixth (Em^{add6}) in m. 1287. The Em^{add6} chord becomes the first measure of Loop 34 (m. 1287).

During the first iteration of Loop 34 (mm. 1287–94), Flutes, Oboes, and Clarinets in B♭ in m. 1291 functioning as a partial octave doubling of the Commander's melody do not count as a part of Loop 34's first iteration. Piccolos, Oboes, Clarinets in B♭, and Harp in mm. 1299–1302,

as a partial melodic imitation of Commander's melody in mm. 1291–96, and are not a part of Loop 34's second iteration (mm. 1295–1302).

In Example 53, the partial iteration of Loop 33 caused by the first measure of Loop Breaker 19 in m. 1285 foreshadows the meaning of "shameful" in m. 1286. In addition, the unusual motion from the V7 chord of E minor in m. 1286 to the tonic chord of E minor with an added sixth shadows the words "shameful fashion" in mm. 1285–86 by adding a sixth to the E minor tonic chord. If the words "shameful fashion" were accompanied by a V7 chord of E minor resolving to a regular tonic chord of E minor without an added sixth, the ordinary resolution of V7 to i might not convey the meaning of "shameful."

Commander's Questions about Intimacy, Love, and Hate

The loop breaker in this section conveys the meaning of "stranger" by challenging the norm of hearing a complete iteration of a loop. The loop breaker becomes a "stranger" who disrupts a loop before its complete iteration.

Still wondering, Commander continues to ask questions to herself about how to be intimate with an Earthling, whether she will fall in love a stranger on Earth, and the issues of love and hate during Succession 5 (Example 54).

During the first iteration of Loop 35 (mm. 1317–21), Commander asks herself how to touch and kiss an Earthling. The word "stranger" is represented by a partial iteration of Loop 35 (mm. 1322–25) and the introduction of Loop Breaker 20 (mm. 1326–28). The sense of strangeness is based on a four-measure partial iteration of Loop 35. The parallel octaves in the fifth measure of Loop 35 is replaced by a texture of both parallel thirds and parallel octaves in m. 1326, which makes Loop 35 a partial iteration and becomes the first measure of Loop Breaker 20.

Loop Breaker 20 (mm. 1327–29) also conveys a sense of strangeness by introducing melodic intervals other than melodic minor seconds, which were heard in mm. 1320, 1321, and 1325. Melodic major seconds in m. 1326; major seconds and major thirds in m. 1327; and minor thirds and augmented fourths in m. 1328 all contribute to this sense of strangeness. After Loop Breaker 20, the two iterations of Loop 36 (mm. 1329–32 and mm. 1333–36) by Harp, Cello, and Maracas accompanies melodies of Trumpets in B♭, Violin I, and Violin II; and Commander's words about love and hate.

Summary of Act I and Preview of Act II

In Act I, successions of loops and loop breakers shadow and foreshadow mainly words and non-singing activities by the Scientist (Prologue), Commander (Scene 1, Scene 2, Scene 2 Conclusion, and Scene 3), and the ensemble by Commander, Ship's Doctor, First Mate and Second Mate (Scene 1, Scene 2, and Scene 2 Conclusion). In Act II, the center of attention is shifted from the Scientist and the ancient aliens to Columbus, his First Mate and Second Mate, and Isabella (Queen of Spain).

CHAPTER 6

ACT II and Act III

Chapter 6 explores eleven moments in Acts II and III—one moment in Act II Scene 1, two in Act II Scene 2, one in Act III Scene 1, three in Act III Scene 2, one in Act III Scene 3, and three in Act III Epilogue. In these thirteen moments, the researcher introduces the musical and dramatic functions to be discussed; informs a reader about singers' and non-singers' activities at the moments; locates successions of loops and loop breakers in musical examples; identifies melodies, rhythms, or chords that make loops and loop breakers musically functional; determines the dramatic functions based on the music, dramatic devices in the theory and practice of drama (see Chapter 3), singers' and non-singers' words and activities (see "Analyses of Dramatic Functions" from Chapter 4); and evaluates how musical and dramatic analyses contribute to Glass's commemoration of Columbus.

Act II Scene 1

In Act II Scene 1, the time line of the opera leaps forward from 50,000 B.C. to Granada in 1492, when the Spanish Queen Isabella and the members of the Spanish court bid farewell to Columbus.[148] The members of the court, represented by the choir, promise Columbus that the Spanish court will grant his heirs and successors from rank to rank forever. Queen Isabella bids farewell to Columbus quoting from the Scripture.

148. Glass, CD Booklet, 9.

Queen Isabella's Farewell to Columbus

In this section, a change of melodic line occurs in the beginning of a loop breaker directs a listener's attention to the words "reginae nutrices tuae (their Queens your nursing mothers)."

Queen Isabella bids farewell to Columbus by quoting from the Scripture during Succession 1 in mm. 1755–78, rr. 26–28 (Example 55). The text "Et a fluminibus usque ad fines terrae (And from the river even to the ends of the earth)" is placed in the first iteration of Loop 37 (mm. 1755–62).[149] The second iteration of Loop 37 (mm. 1763–70) accompanies the text "Et erunt reges nutritii tui (And kings shall be thy nursing fathers)."[150] In m. 1771*1, an iteration of Loop 37 begins but does not continue in m. 1771*2. By comparing m. 1763*2 of Loop 37's second iteration (pitches surrounded by a rectangle) and m. 1771*2 (pitches surround by a dotted rectangle), a listener notices Loop Breaker 21 begins in m. 1771*2.

Loop Breaker 21 (mm. 1771*2–74) causing a partial iteration of Loop 37 directs a listener's attention to the words "reginae nutrices tuae (their Queens your nursing mothers)" after the word "Et (And)."[151] Loop Breaker 21 also makes a listener pay more attention to the analogy between Queen Isabella and the Queens as the nursing mothers. Two iterations of Loop 38 (mm. 1775–76 and mm. 1777–78) follow Loop Breaker 21.

Act II Scene 2

In Act II Scene 2, when Columbus's men begin to lose faith in him on the thirty-second day of the voyage, Columbus sees a vision of Queen Isabella, who encourages him not to lose faith in his mission, and not to doubt his faith in God.

149. The text is from Zechariah 9:10. See English translation in Glass, CD Booklet, 10.
150. The text is from Isaiah 49:23. See English translation in Glass, CD Booklet, 10.
151. Ibid.

Columbus Seeing a Vision of Queen Isabella

Changes of melodic lines in the two loop breakers of this section direct a listener's attention to the words "of the waves" and "you seek."

In mm. 2321–44, rr. 80–83, Queen Isabella reminds Columbus (Don Cristobal) that the evidence of God that he seeks is in each pass of the waves near his feet during two occurrences of Succession 5 in this scene (Example 56).

In the first Succession 5 (mm. 2321–32), the introduction of Loop Breaker 22 (pitches surrounded by a rounded rectangle in mm. 2326*4–*6) makes an iteration of Loop 39 partial (mm. 2324–26*3). Loop Breaker 22 causing a partial iteration of Loop 39 makes a listener pay more attention to the words "of the waves" in the first iteration of Loop 40 (mm. 2327–29) after the words "Each pass." The second iteration of Loop 40 (mm. 2330–32) completes the first Succession 5. If there was no Loop Breaker 22, a listener would hear a succession with two complete iterations of Loop 39 followed by the two iterations of Loop 40. A succession without Loop Breaker 22 does not get the same attention as the first Succession 5 in mm. 2321–32.

The second Succession 5 in mm. 2333–44 has the same music from the first Succession 5 in mm. 2321–32, but has a different text than the first Succession 5. In the second Succession 5 (mm. 2333–44), Loop Breaker 22 (pitches surrounded by a rounded rectangle in mm. 2338*4–*6) also makes a listener pay more attention to the words "you seek" following the words "the evidence."

Columbus's First Mate Saw the Land of America

The music in this section does not highlight the minor but factorial incident (see the "Incident" Section from Chapter 3 for the definitions of minor and factorial incidents). The lack of loop breaker downplays the discovery of America.

Near the end of Act II Scene 2, a listener hears a bird singing sound from an off stage tape, which is a non-verbal acoustic code (see the "Representation" Section from Chapter 3). In the "Incident" Section from Chapter 3, the bird singing is a minor incident that becomes a factorial incident leading to the major incident—the discovery of America. Glass does not mark the spot for the bird singing sound effect in the score. An analyst cannot find the relations among this sound effect, music, and singers.

After the sound, Columbus's First Mate (sung by a Tenor) saw the land of America and sings the following words, "Lumbre! Tierra! Adelante! Adelante! Tierra! Tierra! (Fire! Land! Forward! Forward! Land! Land!)" (Example 57).[152] In Example 57, two iterations of Loop 41 (mm. 2739–42 and mm. 2743–46 in strings and harps) accompany the words "Fire! Land! Forward! Forward!" and two iterations of Loop 42 (mm. 2747–49 and 2750–52 in Strings and Harp) accompany the words "Land! Land!" Between Loops 41 and 42, an analyst cannot find a loop breaker that directs a listener's attention to the words "Land! Land!"[153] The lack of loop breaker minimalizes the importance of the word "Land," and Columbus's First Mate's discovery.

Summary of Act II and Preview of Act III

In Act II, no loop breakers are found to shadow Columbus' singing and non-singing activities. At the moment of the discovery of America, a listener does not hear any loop breaker.

In Act III, the time leaps forward from Columbus's trip in the year 1492 to the year 2092 and backward from 2092 to 1506. In 2092, the archeologists Earth Twin 1 and Earth Twin 2 discovered two directional crystals left by the ancient aliens in Act I. After Earth Twin 1 and Earth Twin 2 bringing the crystals together, the scientists Space Twin 1 and Space Twin 2 in the

152. The fire here refers to the fire came from a Native American's tribe.
153. See a discussion about the lack of loop breaker in the Section "Definitions of Terms" from Chapter 1.

space station discovered the home planet of the ancient aliens, and a human space ship is launched to find the ancient aliens' home planet. In the Epilogue of Act III, after the departure of the space travelers, the time leaps back to 1506, when Columbus meets again with Queen Isabella on his death bed. Finally, Columbus is transported from his death bed to the stars. The person or group who transported Columbus, and the final destination of Columbus are not mentioned.

Act III Scene 1

Earth Twins 1 and 2 Recalling Their Discoveries of the Two Directional Crystals

The loop breaker in this section directs a listener's attention to the words "on the same day" by a change of texture from vertical chords to two linear melodic lines.

In mm. 2928–37, rr. 39–40, Succession 4 highlights words in a sentence by archeologists Earth Twin 1 and Earth Twin 2 (Example 58). In Example 58, Earth Twin 1 and Earth Twin 2 mention that the same event should befall them both on the same day. During the first and second iterations of Loop 43 (mm. 2928–29 and mm. 2930–31), the same event refers to discoveries of two ancient alien's directional crystals by Earth Twin 1 in the Andes, and by Earth Twin 2 in the Ganges.

Loop Breaker 23 (mm. 2932–33) terminates the two iterations of Loop 43, and directs a listener's attention to the upcoming words "on the same day" after "befall us both."[154] After Loop Breaker 23, the restoration of Loop 43 in its third and fourth iterations (mm. 2934–35 and

154. To label mm. 2932–33 Loop Breaker 24, a listener must hear mm. 2932–33 as an iteration of an undividable unit. See Chapter 1 for criteria of loops and loop breakers.

mm. 2936–37) supports the parallel structure between the words “same event” in the first iteration of Loop 43 and the words “same day” in the third iteration of Loop 43.

Act III Scene 2

After archeologists Earth Twin 1 and Earth Twin 2 bringing two ancient aliens’ directional crystals together in Act III Scene 1, scientists Space Twin 1 and Space Twin 2 discovered the home planet of the ancient aliens in Act III Scene 2. As a result, a human spaceship is prepared to find the ancient aliens’ planet. Before departure, the Commander of the spaceship comments on the upcoming voyage, and a ceremony is held after the Commander’s words.

Commander’s View of the Upcoming Voyage

The loop breaker causes a partial loop by a change of chord that directs a listener’s attention to Commander’s words after the word “expedition.”

In Example 59, mm. 3064–89, rr. 7–11, during Succession 3, Commander regards the voyage as a continuation of a tradition to explore the unknowable, and believes that the voyage will not reach its end until the time of their children’s children. In the first and second complete iterations of Loop 44 (mm. 3064–69 and mm. 3070–75), the Commander mentions the tradition that needs to be continued.

After two complete iterations of Loop 44, Loop Breaker 25 starting in m. 3079 causes a partial iteration of Loop 44 in mm. 3076–78 (compare Figure 7 [p. 80] and Example 59 [pp. 152–53]).[155]

155. A listener hears descending tetrachords in mm. 3078–81 and additive process in mm. 3081–85. See the Section “Homage to Baroque Passacaglia” from Chapter 2.

Figure 7: Act III Scene 2, comparison of (a) mm. 3072–73 and (b) mm. 3077–78

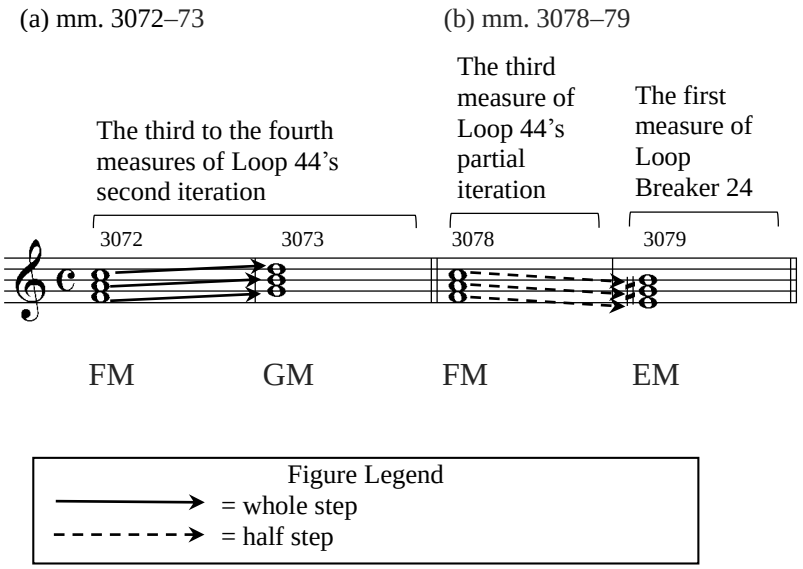


Figure 7a illustrates an ascending motion by whole steps from FM to GM in the third and fourth measures of Loop 44's second iteration. In Figure 7b, a descending motion by half steps from FM to EM replaces the ascending motion by whole steps. A listener notices that the change of chordal motions makes Loop 45 a partial iteration in Figure 7b. The partial iteration of Loop 44 (mm. 3076–78) caused by Loop Breaker 24 (mm. 3079–85) directs a listener's attention to the words after "expedition," the Commander's elaboration on the expedition.

In mm. 3082–87, the last four measures of Loop Breaker 24 and the first two measures of Loop 45, the Commander elaborates that the expedition will not be over until their children's children. The two iterations of Loop 45 (mm. 3086–89 with repeat sign) symbolically conveys the idea of "children's children." The first iteration represents the children, while the second iteration represents the children's children.

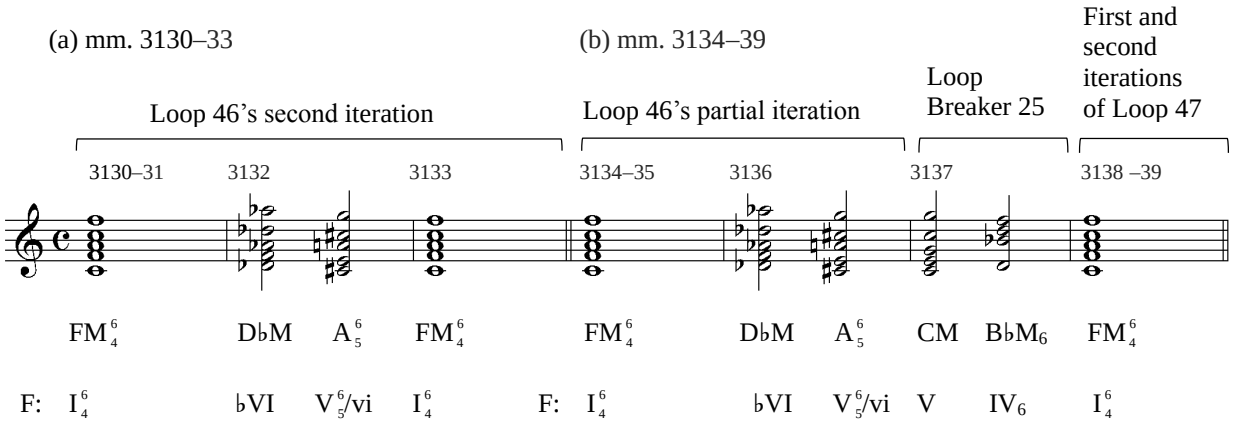
Acknowledgement of the World Rulers of 2092

The loop breaker in this section causing a partial loop by changes of chords directs the attention of a listener to the words “United States of” in the title “the Chancellor of the United States of Africa.”

Before the dignitaries and the world rulers gather to see off the explorers of the spaceship, the Commander of the spaceship states that casting of the Earth is an ascension to heaven.

In mm. 3126–47 (rr. 19–21), the dignitaries announces the titles of the world rulers during Succession 1 (Example 60). The dignitaries mention The Prime Minister of the EEC (European Economic Community) and the President of North America in the first iteration of Loop 46 (mm. 3126–29) and second iterations of Loop 46 (mm. 3130–33). Loop Breaker 25 in m. 3137 causes a partial iteration of Loop 46 in mm. 3135–36, and leads to two iterations of Loop 47 in mm. 3138 and 3139 (compare Example 60 [pp. 154–57] and Figure 8 [p. 81]).

Figure 8: Act III Scene 2, comparison of (a) mm. 3130–33 and (b) mm. 3134–39



In Figure 8a, the V^6_5/vi chord of F major (A^6_5) goes directly to I^6_4 (FM^6_4) skipping the vi. The V^6_5/vi chord in Figure 8b goes to V (CM) instead of I^6_4 (FM^6_4). After IV_6 ($B♭M_6$), a listener finally hears the I^6_4 (FM^6_4) chord. A listener hears the I^6_4 chord in Figure 8a as a cadential $^6_4$ without $^5_3$, but hears the I^6_4 chord in Figure 8b as a reversed cadential $^6_4$ with a IV_6 between $^5_3$ and $^6_4$. This reversed cadential $^6_4$ makes a listener aware that Loop Breaker 25 makes Loop 46 partial, and leads to two iterations of Loop 47.

In Example 60, Loop Breaker 25 in m. 3137 between the partial iteration of Loop 46 in mm. 3134–36 and the two iterations of Loop 47 (m. 3138 and m. 3139) directs the attention of a listener to the words "United States of " in the title "the Chancellor of the United States of Africa." Loop Breaker 25 makes a listener more aware that the African continent in 2092 is united under one nation. If the music accompanies the title "the Chancellor of the United States of Africa" without Loop Breaker 25, a listener would not hear the words "United States of " being emphasized.

Acknowledging Leaders of Companies, World Organization, and Nation

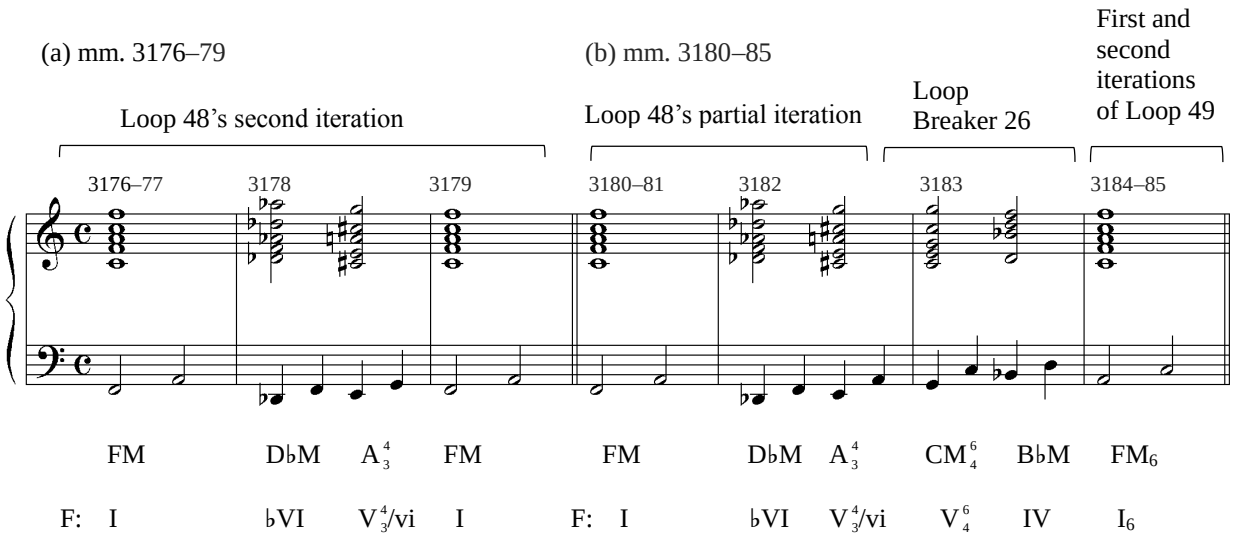
The loop breaker in this section attracts a listener's attention to the words "Executive Director and World Environmental Council" by changing the chords and bass line in the loop before the loop breaker.

During Succession 1, the dignitaries announces titles of economic leaders, world organization, and national ruler in mm. 3172–85, rr. 24–26 (Example 61). The dignitaries mention the titles "Controller of the South American Monetary Fund," and "Executive Vice President of Coca Cola" in the first and second iterations of Loop 48 (mm. 3172–75 and mm. 3176–79).

Special attention is given to Executive Director and World Environmental Council, when Loop Breaker 26 (mm. 3182*8–89) makes Loop 48 partial (mm. 3180–82*7) after the second iteration of Loop 48 (mm. 3176–79).[156] In the second iteration of Loop 48 in m. 3178*8, the eighth note in the bass clef is G2 (see note surrounded by an oval in the example), while in m. 3182*8, the eighth note A2 (see note surrounded by a rectangle in the example) in the bass clef causes of partial iteration of Loop 48, and marks the beginning of Loop Breaker 26.

Loop Breaker 26 (mm. 3182*8–83) also makes Loop 48 a partial iteration (mm. 3180–82*7) by means of chord change (compare Figure 9 [p. 83] and Example 61 [pp. 158–61]).

Figure 9: Act III Scene 2, comparison of (a) mm. 3176–79 and (b) mm. 3180–85



In Figure 9a, the V^4_3/vi of F Major (A^4_3) moves to I (FM) skipping the vi chord, while the V^4_3/vi chord in Figure 9b also skips the vi chord, but moves to V^6_4 (CM^6_4), which is a second inversion of V. A listener does not hear the V^6_4 as an incomplete cadential $^6_4$ of C major because it is

156. Glass and his librettist Hwang do not indicate the Executive Director's organization in the score and the libretto. It is likely referring to the Executive Director of the Space Program. In the score, "World Environmental Council" is misspelled as "World Enviromental Council." The typo is corrected in Example 63.

followed by a IV chord (B♭M) which leads to I_6 (FM_6) in the first and second iterations of Loop 49.

Act III Scene 3

After the ceremonies hosted by the dignitaries and world leaders in Act III Scene 2, the Commander, Space Twin 1, First Mate of the Commander, and Space Twin 2 begin to board the spaceship. Each of them takes a telephone-headset to bid farewell to the people on Earth in the year 2092, and to express their feelings about the mission in Act III Scene 3. Succession 3 highlights the word "never" in the sentence "I never imagined" in mm. 3297-3302, r. 16. See the Sections "Statement of the Problem," and "Limitation" from Chapter 1 for two different analyses of musical and dramatic functions.

Act III Epilogue

After the spaceship departed, the scene cuts to the year 1506 when Columbus is on his death bed accompanied by the chanting of a requiem mass by Dominican monks, and Queen Isabella appears as a ghost in front of him in Act III Epilogue.[157]

Columbus on His Death Bed in 1506

In this section, the loop breaker by a change of melodic lines shadows the departure of Queen Isabella, and foreshadows the re-entrance of Columbus.

In Example 62, mm. 3402–06, nearing his death, Columbus thinks that he might be dead because the Dominican monks are chanting. A wordless chorus represents the Dominican monks'

157. Glass, CD Booklet, 16.

chanting, which is an indication that Columbus is too sick to hear words from the chanting. The wordless chorus also becomes a wordless vocal orchestra that forms loops and loop breaker in Succession 2 in 3406*2–26.

In Succession 2, after two iterations of Loop 50 (mm. 3406*2–10*1 and mm. 3410*2–14*1), Loop Breaker 27 (mm. 3414*5–18) causes a partial iteration of Loop 50 (mm. 3414*2–*4) (Compare Figure 10 [p. 85] and Example 62 [pp. 162–64]).

Figure 10: Act III Epilogue, comparison of (a) mm. 3410*2–*5 and (b) mm. 3414*2–*5

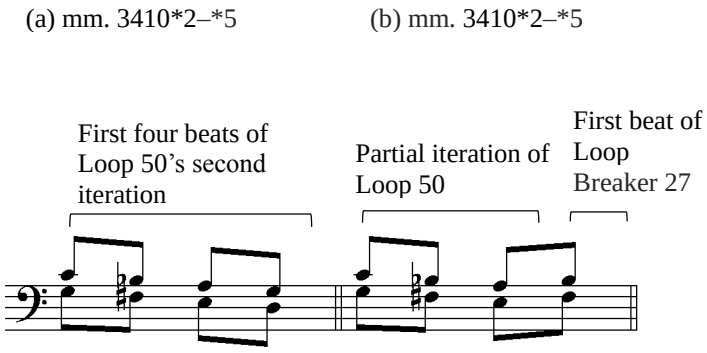


Figure 10a illustrates a stepwise descending motion in Loop 50's second iteration in mm. 3410*2–*4. In Figure 10b, the ascending stepwise motion between m. 3410*4 and m. 3410*5 makes the iteration of Loop 50 end at the third beat, and marks the beginning of Loop Breaker 27.

In Example 62, Loop Breaker 27 beginning at m. 3414*5 shadows the departure of Queen Isabella in m. 3415, and foreshadows a possible reentrance of Columbus after the breaker. The textless first iteration of Loop 51 (mm. 3419–22) follows Loop Breaker 27. During the second and third iterations of Loop 51 (second iteration of mm. 3419–22, and m. 3423),

Columbus responds to Isabella by acknowledging her singing, and by pointing out that Isabella is the person who led him to the sea. During the third iteration of Loop 51, the first iteration of Loop 52 (mm. 3427–28), and the second iteration of Loop 52 (mm. 3428–29), Columbus sings, although he neglected to visit Isabella on her dead bed, Isabella should still promise that Columbus can keep one-tenth of the wealth he discovered.[158]

The Ghost of Queen Isabella Seducing Columbus

The loop breaker that terminates ascending stepwise tremolos in the loop signifies Queen Isabella's power to seduce Columbus.

As a ghost in front of Columbus's death bed, Isabella seduces Columbus to join her in the bed, and to enter her world in the afterlife during Succession 3 (Example 63). In the first iteration of Loop 53 (mm. 3463–66), Isabella asks Columbus to embrace her with his final breath. The four-octave ascending chromatic scale in the bass clef is the loop-related part in both iterations of Loop 53 (mm. 3463–66 and 3467–70). Other orchestral parts during the two iterations of Loop 53 are not considered loop-related parts. For Example, during the first iteration of Loop 53, instruments in the treble clef form a succession of chords: Em→ CM → Bm → B♭M$_6$ → Em$_6$ → Em→ DM$_6$ → Dm. The fourth chord B♭M$_6$ during the first iteration of Loop 53 (see the circled chord in m. 3464) is replaced by B♭M$^6_4$ in the second iteration (see the two circled chords in mm. 3464 and 3468).

In the second iteration of Loop 53, Isabella asks Columbus to join her in her bed, and to enter her world in the afterlife. The textless Loop Breaker 28 (mm. 3471–74) after the second

158. Succession 2 in Example 62 ends in m. 3426 when the third iteration of Loop 51 ends. In order not to end Columbus's words in mid-sentence, the two iterations of Loop 52 in mm. 3427–28 and mm. 3429–30 are also included in the example. There is no loop breaker that highlights words and shadows meanings of words between the third iteration of Loop 51 and the first iteration of Loop 52.

iteration of Loop 53 terminates Isabella's words, and leads to two iterations of another textless loop, Loop 54 (mm. 3475–78 with a repeat sign), which completes Succession 3.

Loop Breaker 28 not only terminates Isabella's words in Loop 53, but also provides a listener a sense of Isabella's power. The breaker ending the two iterations of Loop 53 signifies Isabella's power to pull Columbus out from his bed. The breaker leading to Loop 54 also symbolizes Isabella's ability to take Columbus to her world in the afterlife.

Queen Isabella Fails to Seduce Columbus

The first loop breaker in this section signifies the meaning of "resist" by making the first loop partial through changes of chords and melodic lines. The second loop breaker that terminates the second loop by means of chord and melody changes conveys the meaning of Columbus's words "I am unable to tarry here longer."

In the first Succession 5 (mm. 3595–3606), Isabella finally realizes her attempt to seduce and bring Columbus with her is futile, and bids farewell to Columbus (Example 64). In the first iteration of Loop 55 (mm. 3595–98), Isabella says goodbye to Columbus, and admits that Columbus resists her song. The action of resisting is signified by Loop Breaker 29 (m. 3602) which makes an iteration of Loop 55 partial (mm. 3599–3601). If there were two iterations of Loop 55 without Loop Breaker 29, a listener would not relate the loops to Columbus's resistance of Isabella's song.

From the last beat of Loop Breaker 29 to the second iteration of Loop 56 (mm. 3602*6–06), Columbus regrets that he cannot stay any longer. The two iterations of Loop 56 (mm. 3603–04 and 3605–06) serve as the end of the first Succession 5 (mm. 3595–3606), and the beginning of the second Succession 5 (mm. 3603–14) (compare Example 64 [pp. 167–68] and Figure 11 [p. 88]).

Figure 11: Act III Epilogue, Overlapping of two Succession 5

First Succession 5 (mm. 3595–3606)							
			Second Succession 5 (mm. 3603–3614)				
3595–98	3599–3601	3602	3603–04	3605–06	3607–10	3611–12	3613–14
First iteration of Loop 55	Partial iteration of Loop 55	Loop Breaker 29	First iteration of Loop 56	Second iteration of Loop 56	Loop Breaker 30	First iteration of Loop 57	Second iteration of Loop 57

In Figure 12, the first Succession 5 overlaps with the second Succession 5 in mm. 3603–06, during the first and second iterations of Loop 56.

In Example 66, during the two iterations of Loop 56 (mm. 3603–06), Columbus states that he is unable to stay with Isabella longer. Loop Breaker 30 (mm. 3607–10) that terminates the second iteration of Loop 56 confirms that Columbus has to leave Isabella. During Loop Breaker 30, Columbus states the journey waiting for him is more seductive than Isabella's temptation to take him away from his voyage. In the first and second iterations of Loop 57 (mm. 3611–12 and 3613–14) after Loop Breaker 30, Columbus' words "finally we take the voyage when the voyage takes us" imply that Columbus is the right person for the right voyage, but Isabella is not. Instead of returning to Loop 56, the introduction of Loop 57 reconfirms Columbus' strong will to leave Isabella and continue his journey. If an analyst regarded Loop 57 as a variant of Loop 56 with fewer instrumental parts, the music would not function as a reconfirmation of Columbus' strong will.[159]

159. See the Section "Limitations" from Chapter 1 for a discussion on variants of loops.

The End of the Opera

The continuation of Columbus' voyage is illustrated at the end of the opera by the transportation of his bed to the stars.[160] By not revealing Columbus' final destination in the opera, one can imagine that Columbus' transportation might be a voyage through space and/or time, which might take him to meet with aliens at his time, the scientist in Act I Prologue, the ancient aliens from the late Ice Age or from the year 2092, or the future human space explorers in the year 2092.

160. Glass, CD Booklet, 18. Columbus' transportation to the star is a reference to the *Star Trek* media franchise. See the discussion on the Second Mate's disappearance in the Section "The Second Mate's Version of the New World, His Departure and the First Mate's Wishes" from Chapter 5.

CHAPTER 7

CONCLUSION

Chapter 7 concludes the research on Philip Glass's opera *The Voyage* with two sections—"Findings" and "Suggestions for Future Research." The first section shows findings based on analyses of musical and dramatic functions of loops and loop breakers in twenty-four moments of the opera—thirteen from Act I (see Chapter 5) and eleven from Acts II and III (see Chapter 6). Based on this research, the second section explores possibilities for future studies on the opera and other minimalist operas by Glass and others.

Findings

Based on the analyses in Chapters 5 and 6, a succession of loops and loop breakers functioning as a wordless musical narrator announces departures, entrances, and activities of singers and non-singers; participates in dramatic devices such as incidents, dialogues, and soliloquies; shows the non-narrative and non-narrativity characteristics of the opera; and presents a non-celebrative commemoration of Columbus.

The successions of loops and loop breakers make reiterating and non-reiterating musical materials functional in the music of the opera. Based on Meyer's theories of structural gap, hypothetical meaning, evident meaning, and determinate meaning, loops and loop breakers in successions become musically functional when they can create and sustain a norm, depart from a norm, and return to a norm for a listener. When a listener can associate the musically functional loops and loop breakers with the dramatic content, they function as a wordless musical narrator.

Successions of loops and loop breakers as a wordless musical narrator, who announces departure and entrances of singers and upcoming non-singing activities, enters a status of

soliloquy, in which the narrator provides real-time information on the stage to a listener without any interaction with singers and non-singers. When participating in incidents, dialogues, and soliloquies; the wordless musical narrator provides additional help for a listener to understand incidents, comments on singers' opinions in dialogues, and sympathizes with singers' feelings in soliloquies. This narrator is Glass's authorial voice conveying information that characters cannot express through their melodies.

Successions of loops and loop breakers as a wordless musical narrator illustrates two characteristics of the opera—non-narrative and non-narrativity.

In the "Plot" Section of Chapter 1, the plot of the opera shows characteristics of a non-narrative. A listener regards the music of the opera presented in Chapters 3 and 4 as a non-narrative. According to Jann Pasler, much minimal music is considered a non-narrative because it "consists largely of traditional triads and their inversions, however the triads are not used as structural means of establishing, departing from and returning to a tonal center, nor are they incidental references to the tonal system."[161] The triads and their inversions found in loops and loop breakers do not show large-scale departure and return to a tonal center among successions. Instead, loops and loop breakers within a succession establishes and maintains a tonal center (Figures 6 and 8; and Examples 54 and 60). Moreover, neighboring chordal motions (Figures 3 and 6, and Examples 46 and 53), and parallel stepwise chordal motions (Example 59) within successions of loops and loop breakers prevent a listener from associating chords with tonal centers.

A listener associates characteristics of non-narrativity in a non-narrative with loops and loop breakers in the opera. Pasler observes that composers of works with non-narrativity intends

161. Pasler, "Narrative and Narrativity," 40.

to "erase the role of memory" by "renouncing and refusing to mediate between the sounds they produce or call for."[162] In the opera, loops and loop breakers function neither as leitmotifs that signify the roles of singers and non-singers throughout the opera, nor as musical motives that unify the musical structure of the opera. Instead, loops and loop breakers shape impressions of characters and musical passages within short moments of the opera.

Pasler defines a non-narrative as having "elements of narrative without allowing them to function as they would in a narrative."[163] Borrowing Pasler's idea of non-narrative, the opera moves toward a non-celebration of Columbus because a listener realizes that Glass does not assign all moments of celebration exclusively to Columbus's achievement, and Glass's musical design also suppresses a moment of Columbus-related celebration. Loops and loop breakers in Examples 60 and 61 accompany the moment of celebration when the future human spaceship departs in the year 2092. A listener cannot find a loop breaker in the music that accompanied the moment, when Columbus' First Mate sees the coast of the New World in Example 57. The lack of a loop breaker between iterations of two different loop draws less attention from a listener, and suppresses the celebration of Columbus's discovery of the New World. A listener may consider the suppression of Columbus's achievement in the opera a social commentary on the European colonization in America, and a lesson for future human space explorers.

Suggestions for Future Research

This research about musical and dramatic functions of reiterating and non-reiterating materials (loops and loop breakers) in Philip Glass's minimalist opera *The Voyage* provides opportunities for future research from perspectives of a viewer and a performer. Based on score

162. Pasler, "Narrative and Narrativity," 41.
163. Pasler, "Narrative and Narrativity," 40.

analysis with the aid of audio recording, this research is conducted from a listener's perspective. At the time of the research, video recording and live performance of this opera are not available. If a video recording or live performance becomes available in the future, a researcher can conduct a research from a viewer's perspective that incorporates Pfister's ideas of visual codes (See the Section "Representation" from Chapter 3). Using the score and audio recording analyses as a point of departure, an analyst can conduct a research regarding the relations among loops, loop breakers and staging elements, such as positions and gestures of singing and non-singers, scenic backgrounds, costumes, and lighting. For example, when a loop breaker terminates or interrupts a loop, or when a new loop is introduced after a loop breaker, does the above mentioned staging elements correspond to the changes made to a loop or a loop breaker? From a performer's perspective, when changes are implemented to a loop or a loop breaker, does a singer or non-singer make corresponding movements or gestures? How does an instrumentalist, or a conductor prepare for changes of a loop and a loop breaker? The answers to these questions will be beneficial for the studies of *The Voyage*, and the minimalist operas by Glass and others.

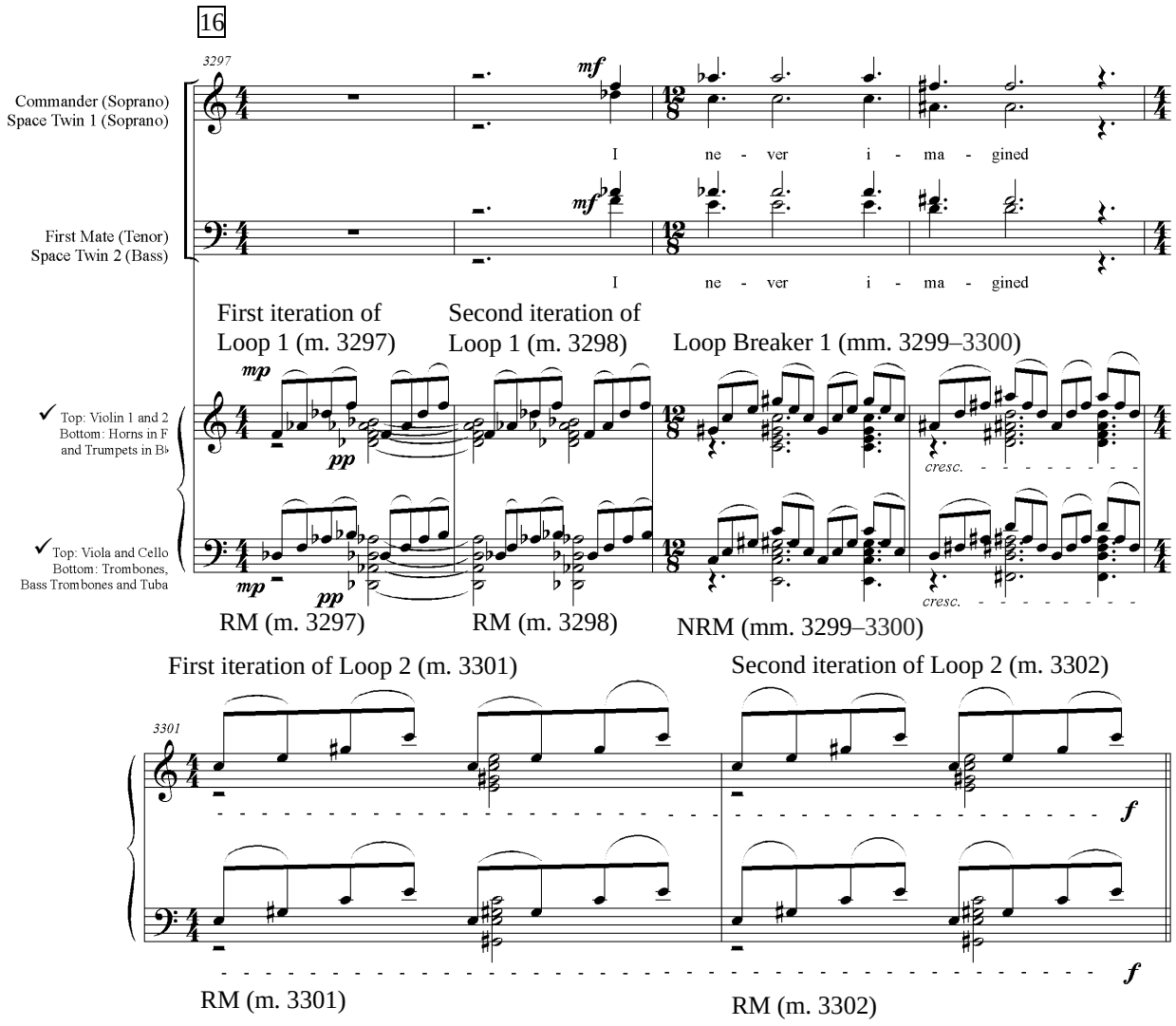
TABLES

Table 1: Glass's rehearsal numbers and my measure numbers.

Scenes	Glass's Rehearsal Numbers	My Measure Numbers
Act I Prologue	1–33	1–153
	28A–33A	154–182
	34–65	183–314
	65A	315–19
	66	320–24
	66A	325–30
	67–74	331–70
Act I Scene 1	1–32	371–498
Act I Scene 2	1–42	499–715
Act I Scene 2 Interlude	1–3	716–35
	2A–3A	736–47
	4–23	748–883
	21A–23A	884–907
	24	908–14
Act I Scene 2 Conclusion	1–28	915–1124
Act I Scene 3	1–85	1125–1505
	84A–85A	1506–13
	83A	1514–17
	84A1–85A1	1518–25
	86–87	1526–33
Act II Scene 1	1–16	1534–1651
	11A–16A	1652–95
	17–29	1696–1786
	24A–29A	1787–1834
	30–35	1835–75
Act II Scene 2	1–114	1876–2566
	113A–114A	2567–82
	115–153	2583–2767
Act III Scene 1	1–55	2768–3029
Act III Scene 2	1–21	3030–3139

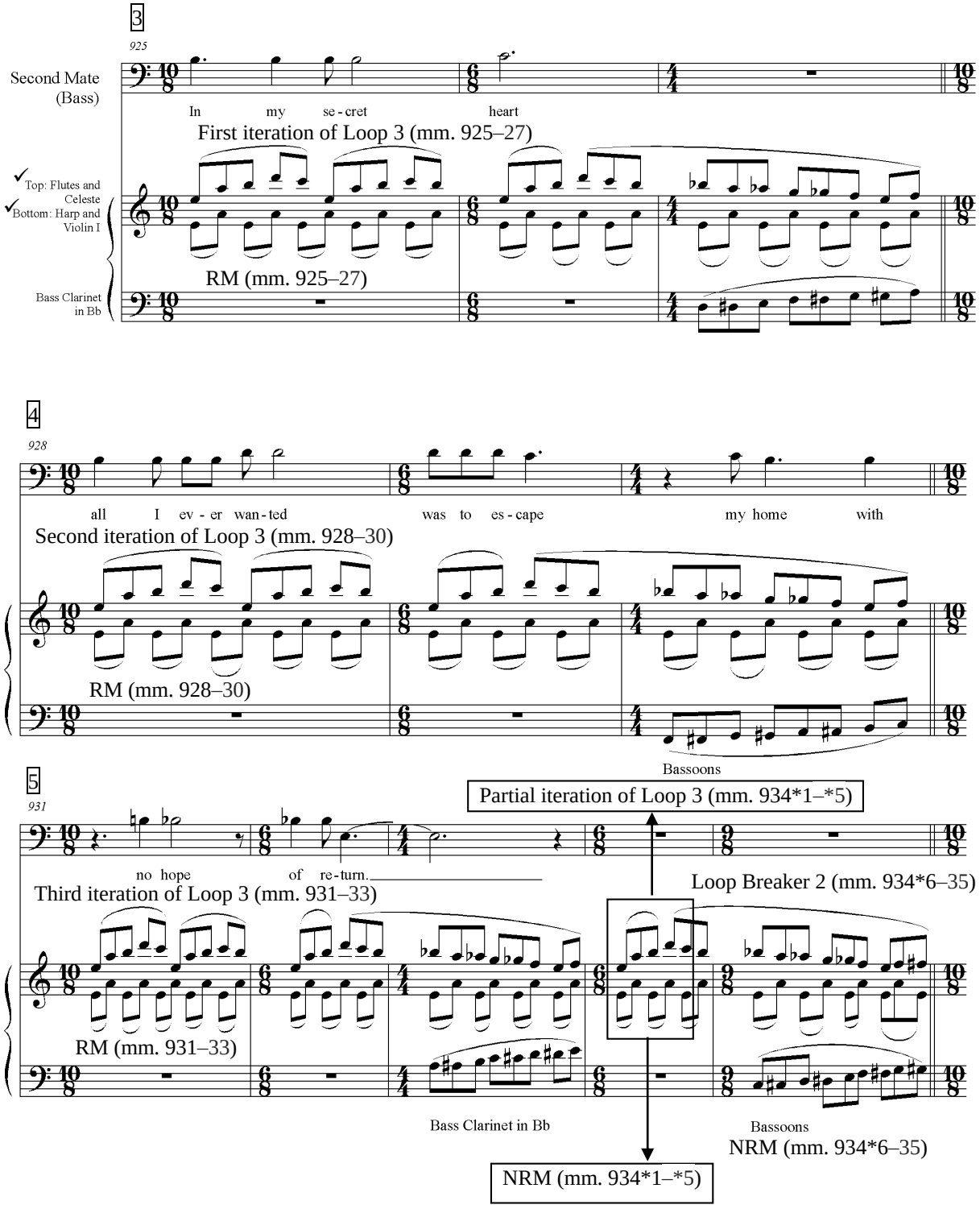
	17A–21A	3140–67
	22–27	3162–89
	22A–27A	3190–3217
	28–32	3218–37
Act III Scene 3	1–34	3238–3375
Act III Epilogue	1–67	3376–3653

Example 1: Act III Scene 3, mm. 3297–3302, r. 16



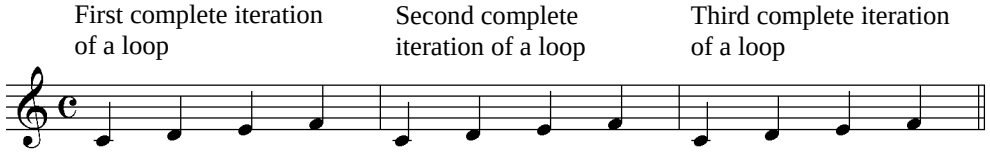
✓: Instruments forming Loop 1, Loop Breaker 1, and Loop 2

Example 2: Act I Scene 2 Conclusion, mm. 925–44, rr. 3–5

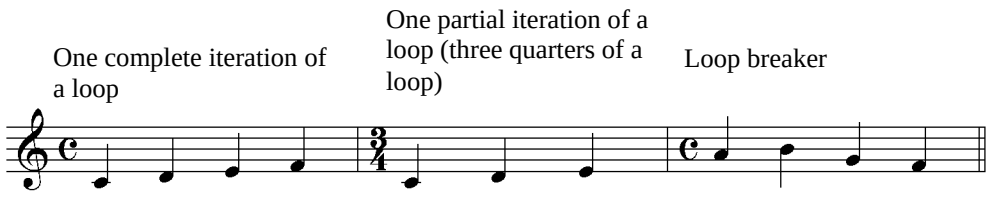


✓: Instruments forming Loop 3, partial Loop 3, and Loop Breaker 2

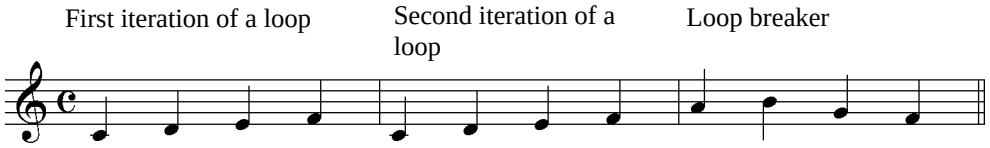
Example 3: Two or more successive complete iterations of the first measure



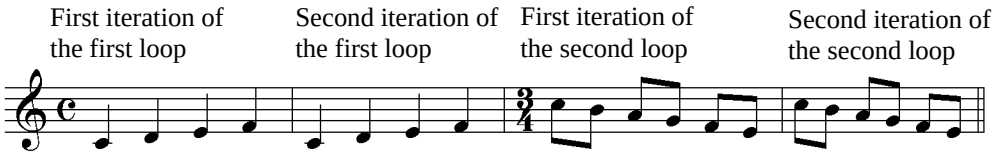
Example 4: Complete iteration of a loop, partial iteration of a loop, and a loop breaker



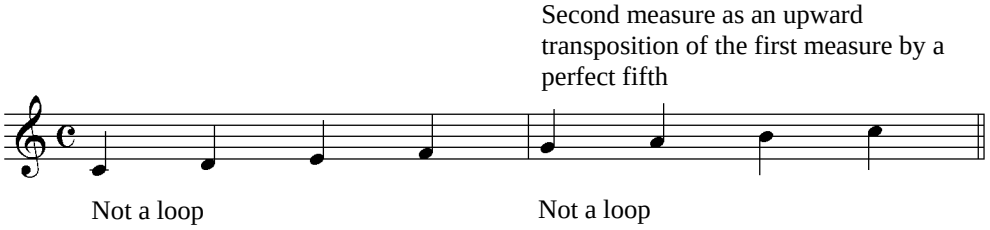
Example 5: A loop breaker terminating a loop



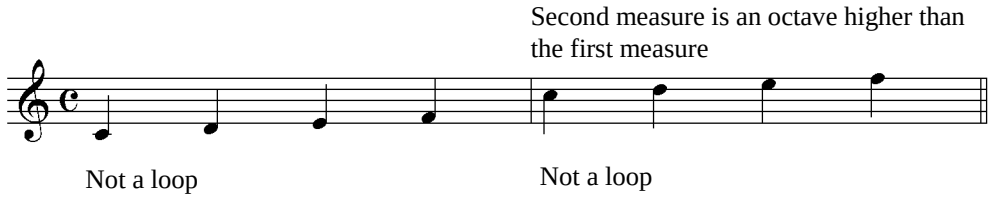
Example 6: No loop breaker



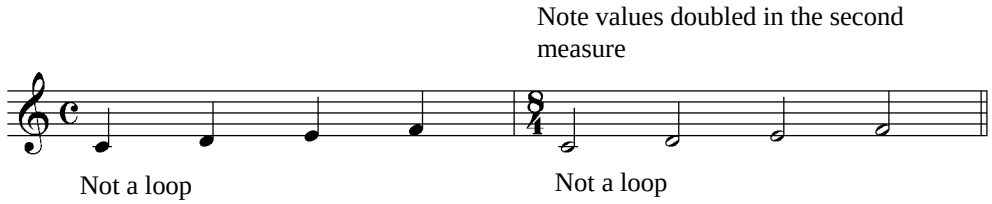
Example 7: Transposition



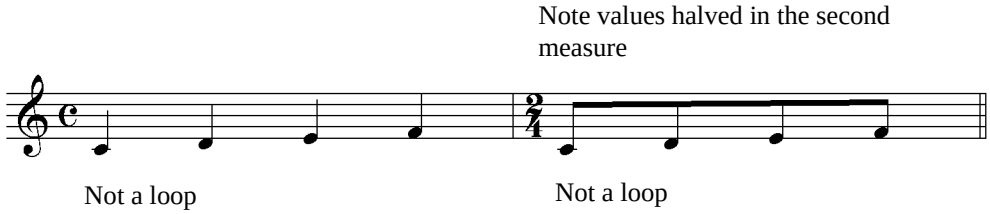
Example 8: Change of register



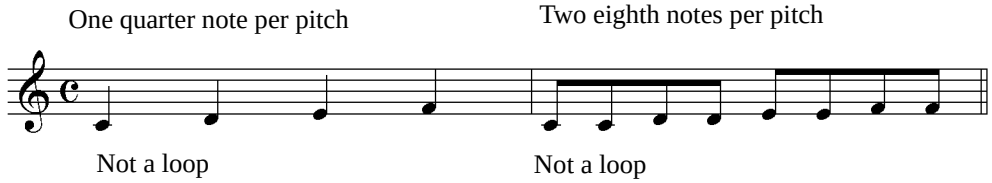
Example 9: Augmentation of note values



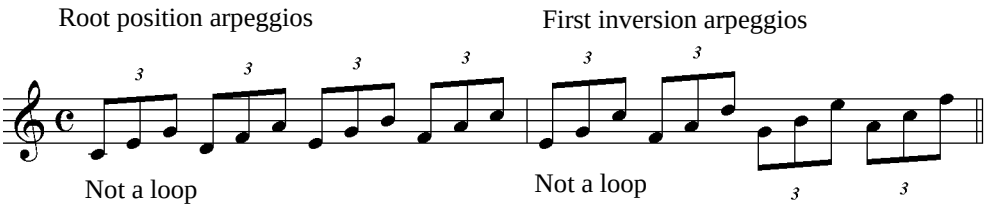
Example 10: Diminution of note values



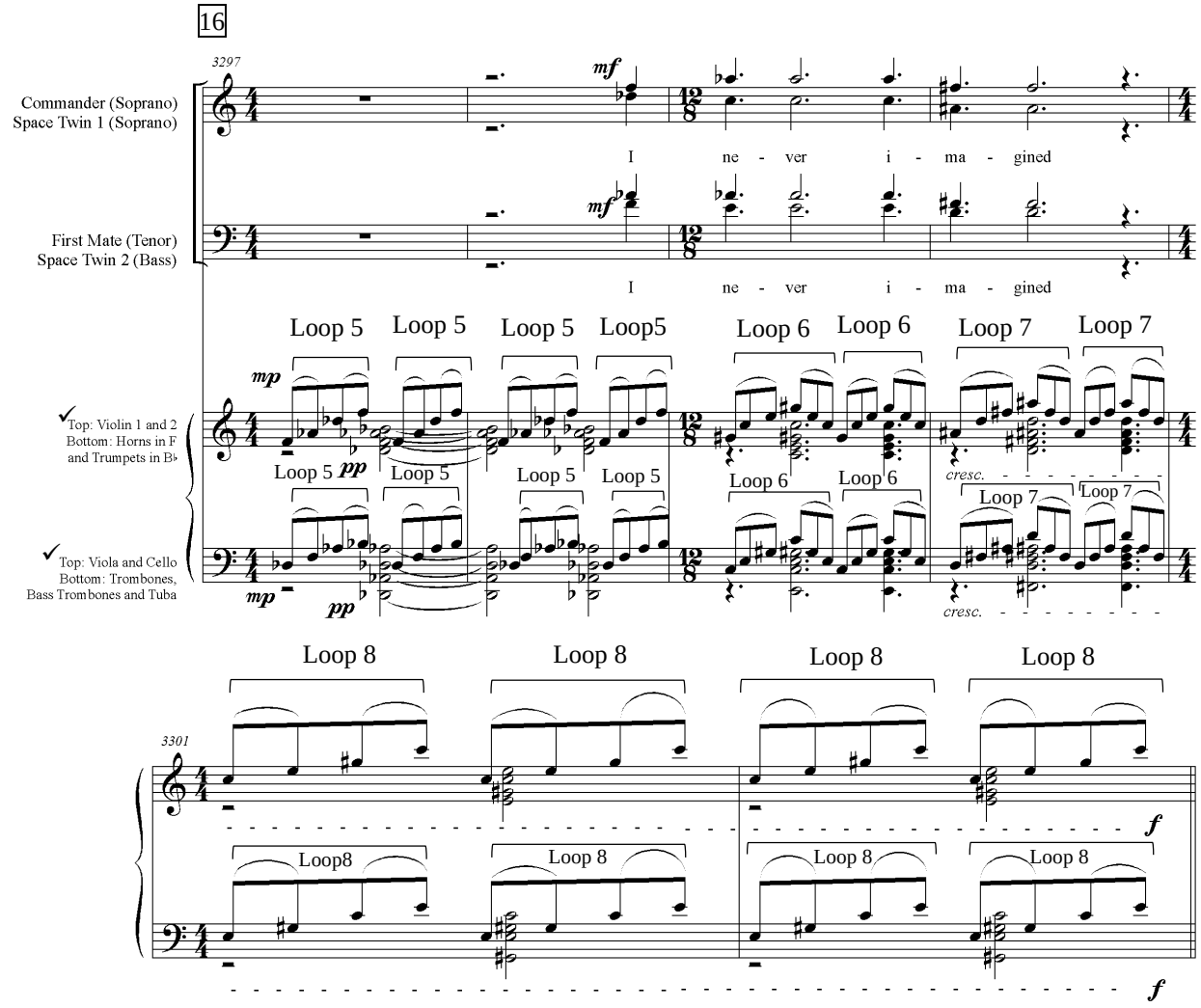
Example 11: Change of rhythmic pattern



Example 12: Inversions of chords

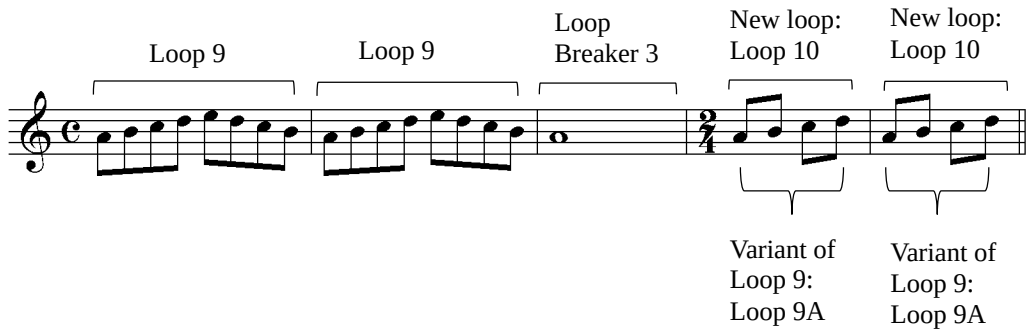


Example 13: Act III Scene 3, mm. 3297–3302, r. 16 (second analysis)

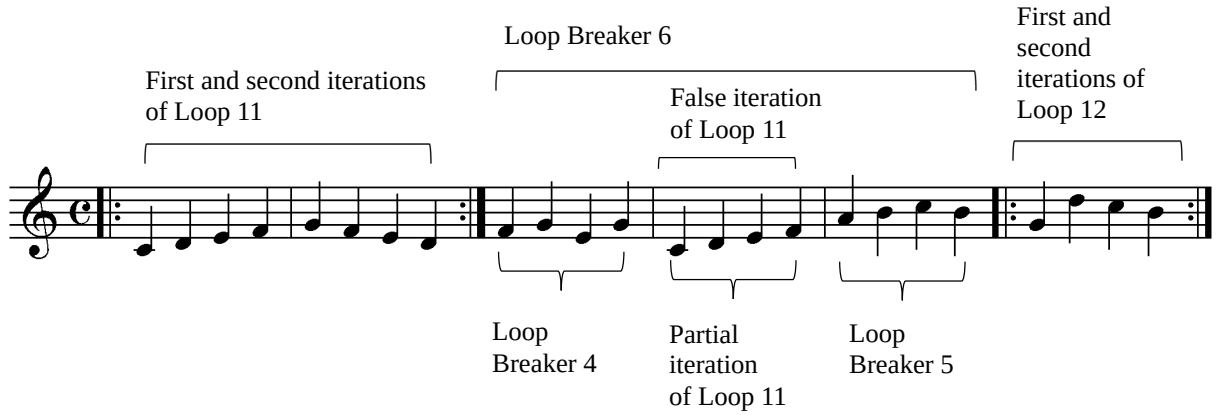


✓: Instruments forming Loops 5, 6, 7, and 8

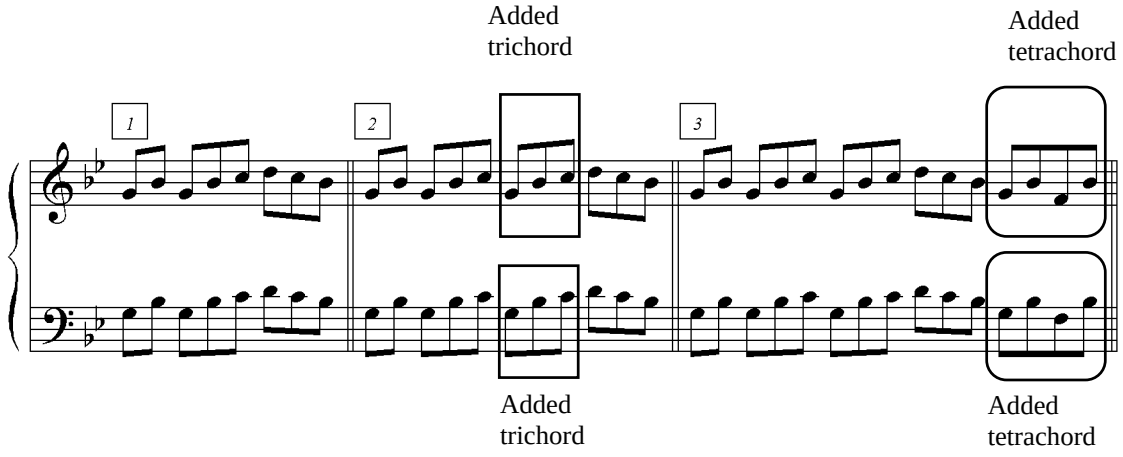
Example 14: A new loop or a variant of the previous loop?



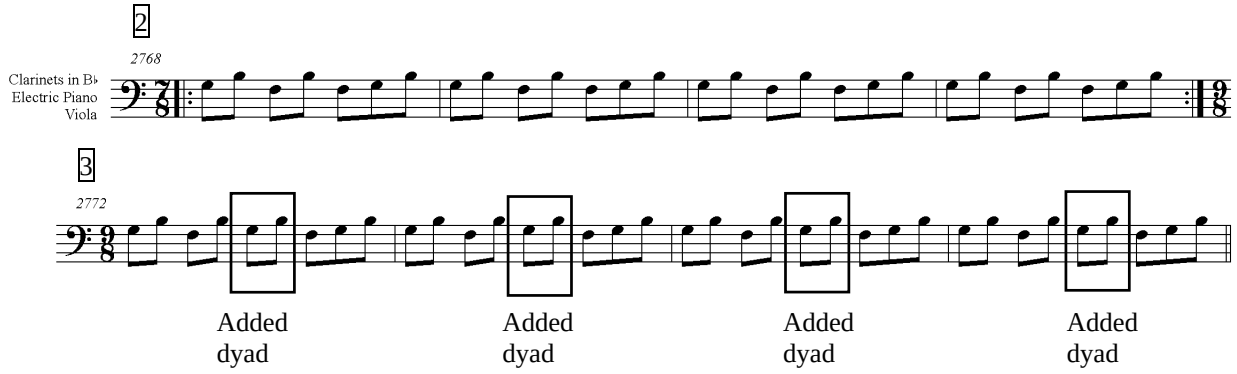
Example 15: False and partial iterations of Loop 10



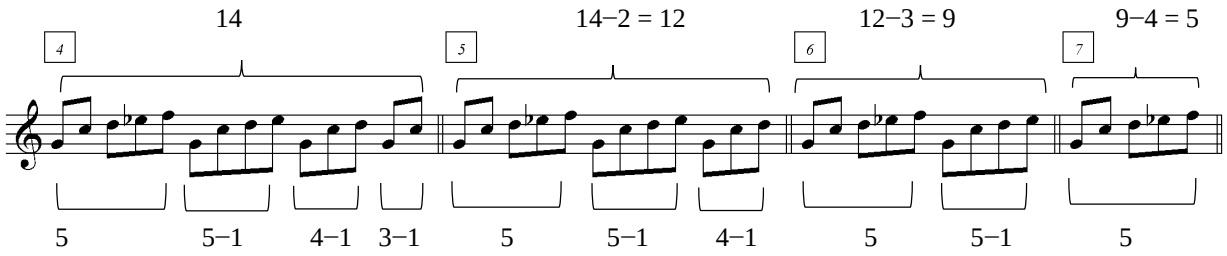
Example 16: Philip Glass: *Music in Similar Motion* (1969), mm. 1–3



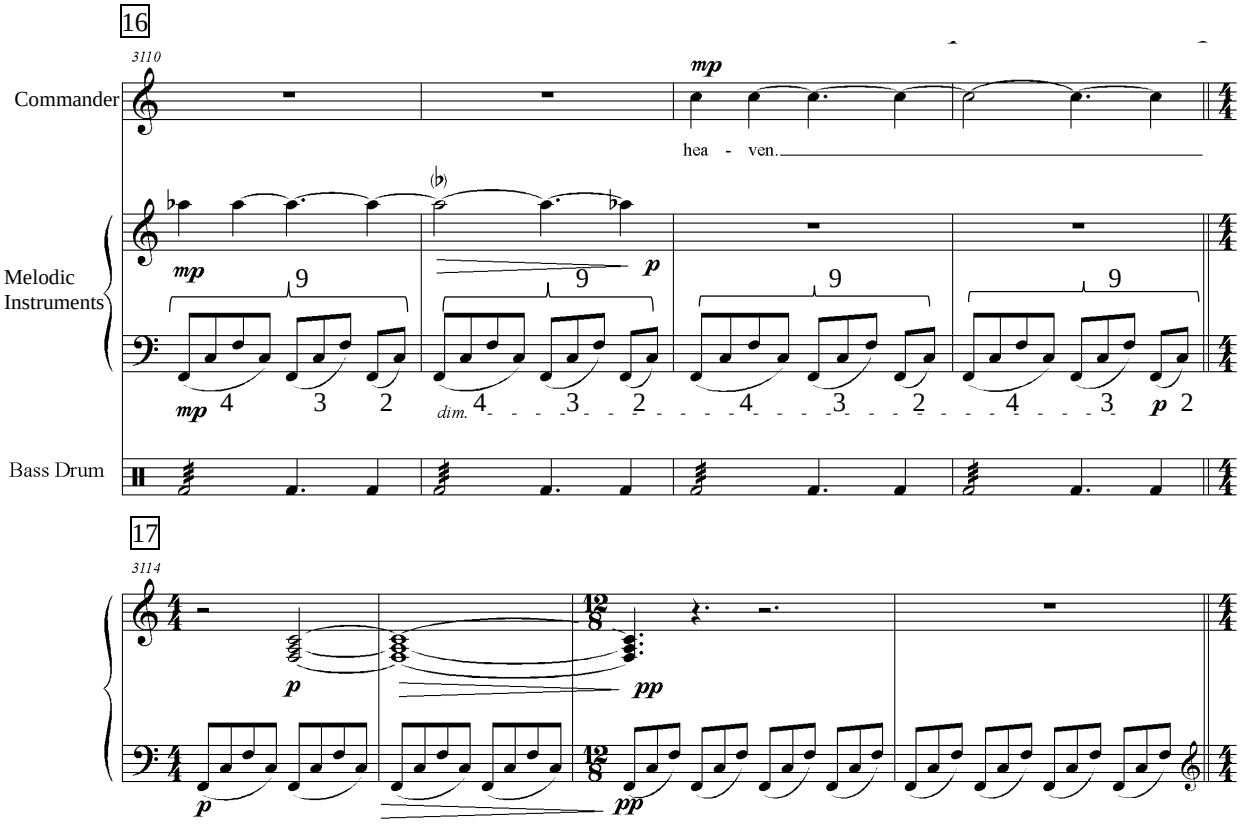
Example 17: Glass: *The Voyage*, Act III Scene 1, mm. 2768–75, rr. 2–3



Example 18: Glass: *Two Pages* (1969), Figures 4–7

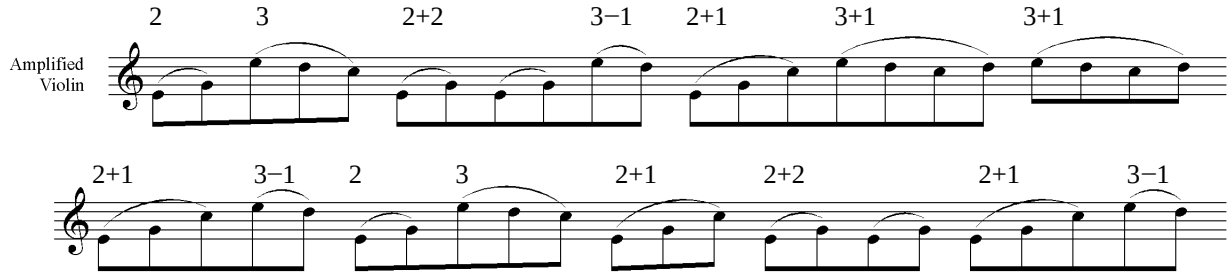


Example 19: Glass: *The Voyage*, Act III Scene 2, mm. 3110–17, rr. 16–17



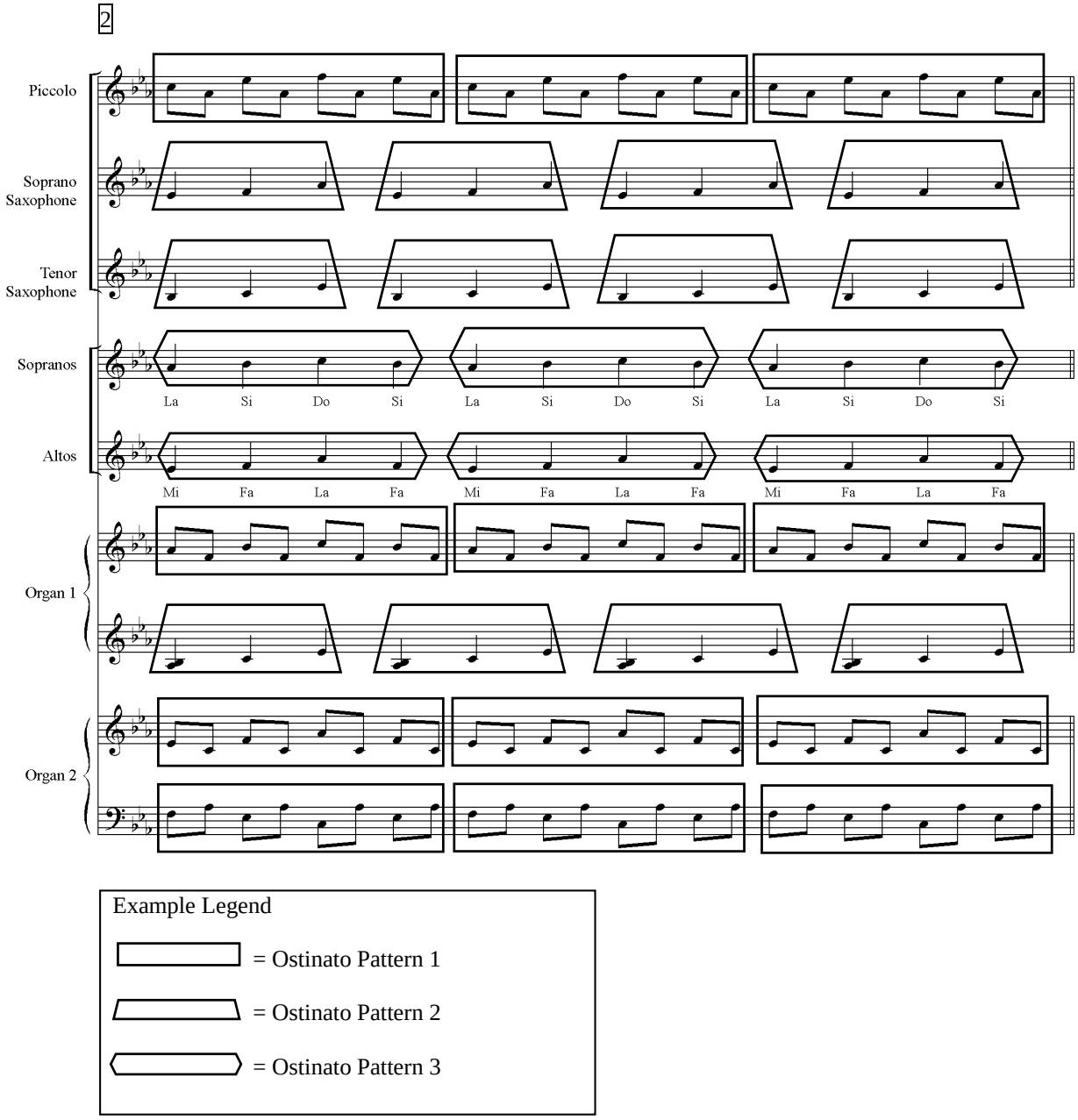
Four iterations of "9−3−2" Eight iterations of "4−1" or "9−4−2"

Example 20: Glass: *Strung Out* (1967) for amplified violin, first two lines

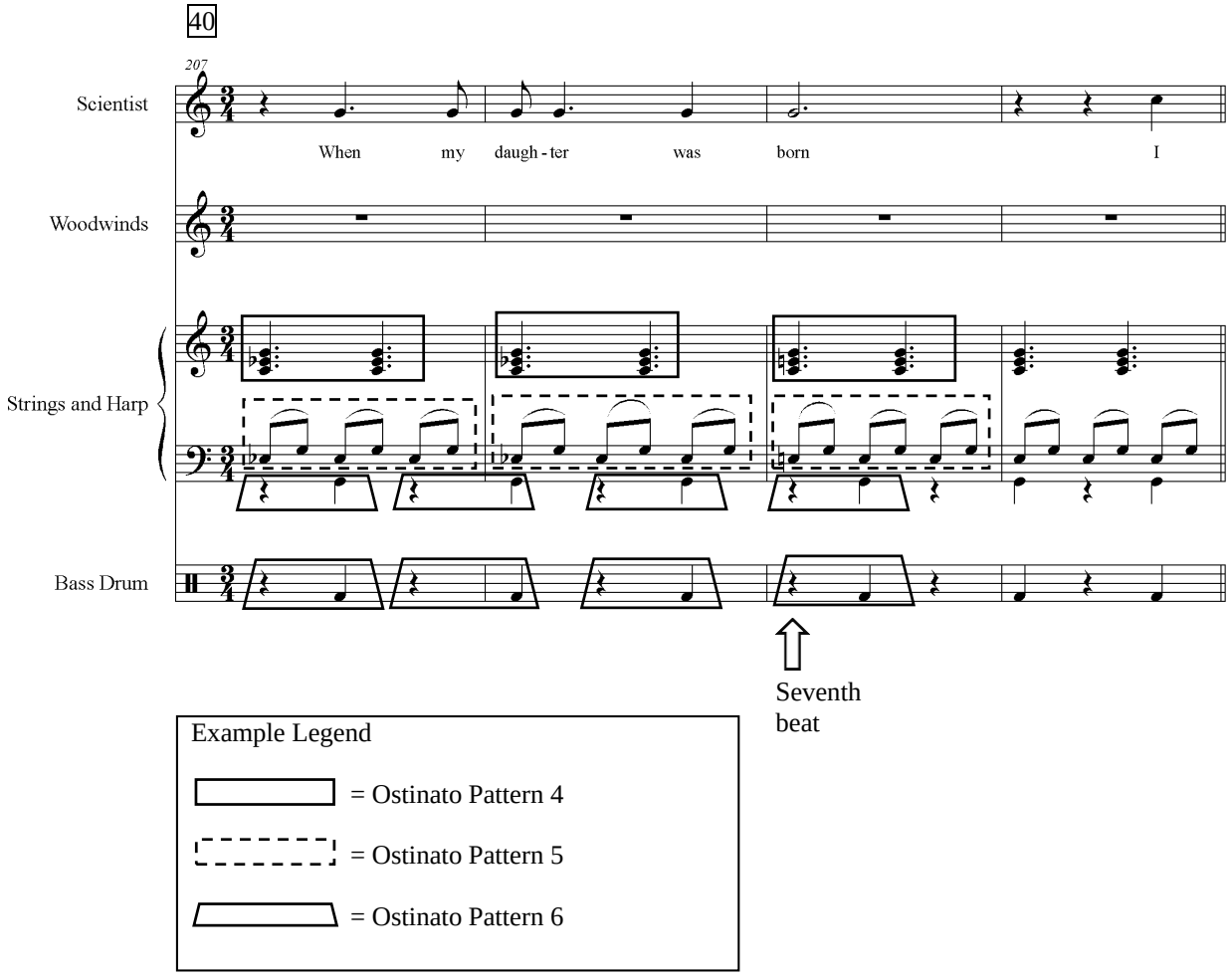


Or: (2+1)−1 (3−1)+1

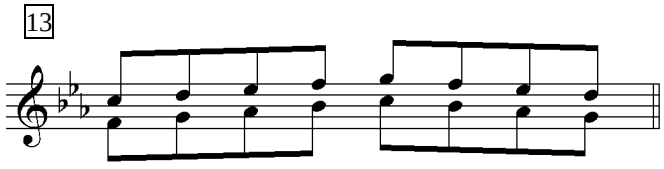
Example 21: Glass: *Einstein on the Beach* (1976), “Train”: Figure 2



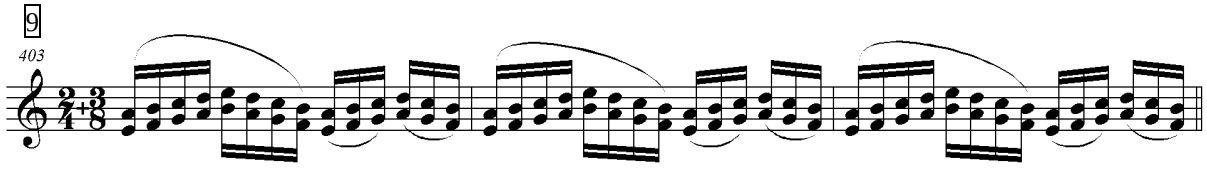
Example 22: Glass: *The Voyage*, Act I Prologue, m. 207–10, r. 40



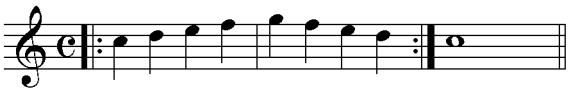
Example 23: Glass: *Music in Fifths* (1969), Figure 13



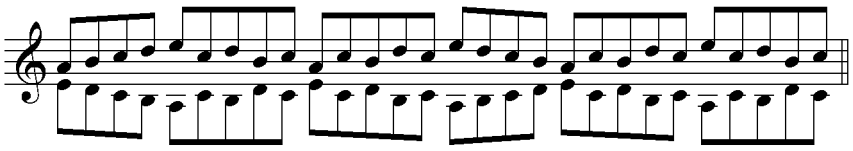
Example 24: Glass: *The Voyage*, Act I Scene 1, mm. 403–05, r. 9



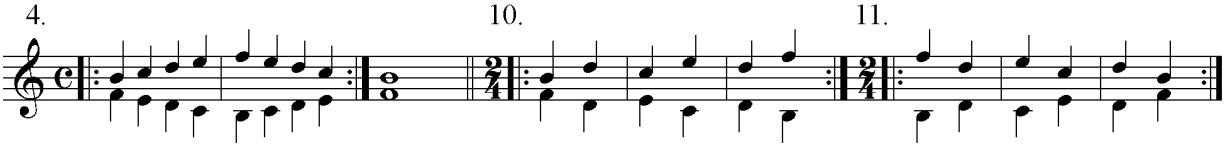
Example 25: Ferdinand Beyer: “Exercises in Touch for the Right Hand,” Exercise 10



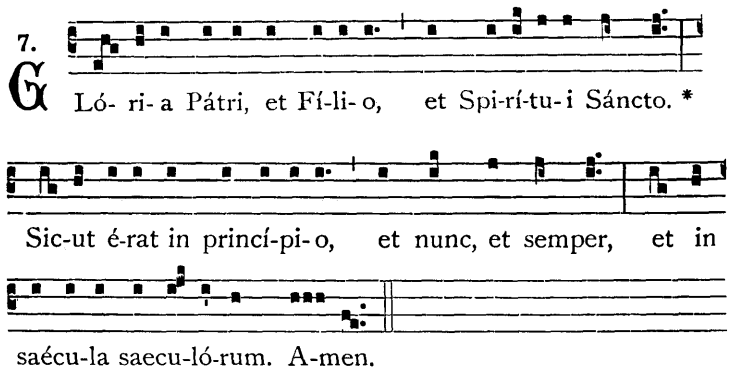
Example 26: Glass: *Music in Contrary Motion* (1969), Figure 1



Example 27: Beyer: “Exercises for Both Hands Together,” Exercises 4, 10, and 11



Example 28: A doxology from “Tones of the Verse: Gloria Patri”

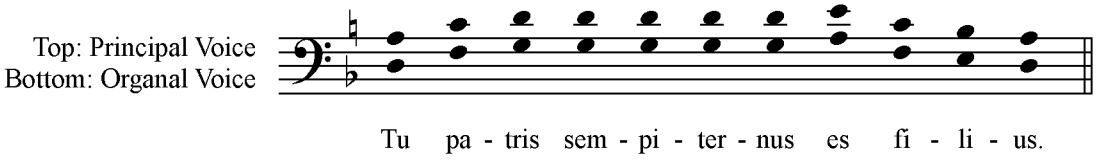


Translation: Glory be to the Father, and to the Son, and to the Holy Spirit.

As it was in the beginning, is now, and ever shall be,

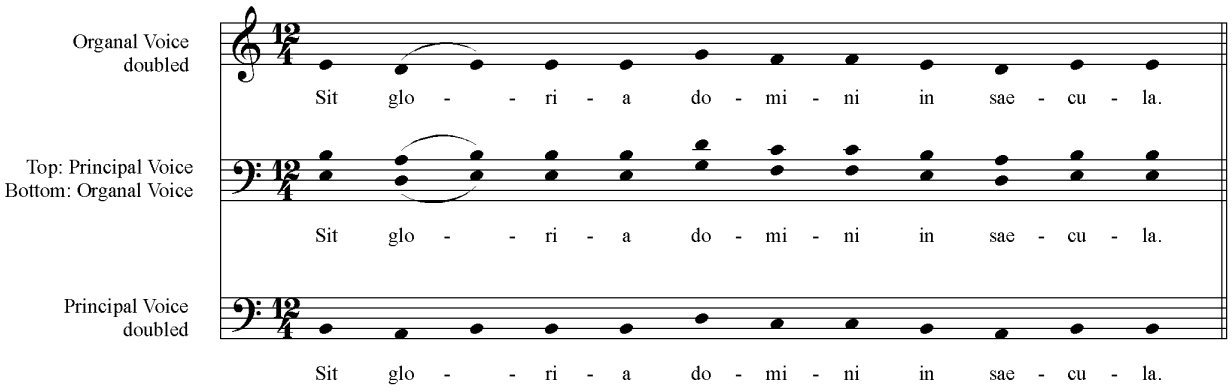
world without end. Amen.

Example 29: *Tu patris sempiternus es filius*, in parallel organum at the fifth below



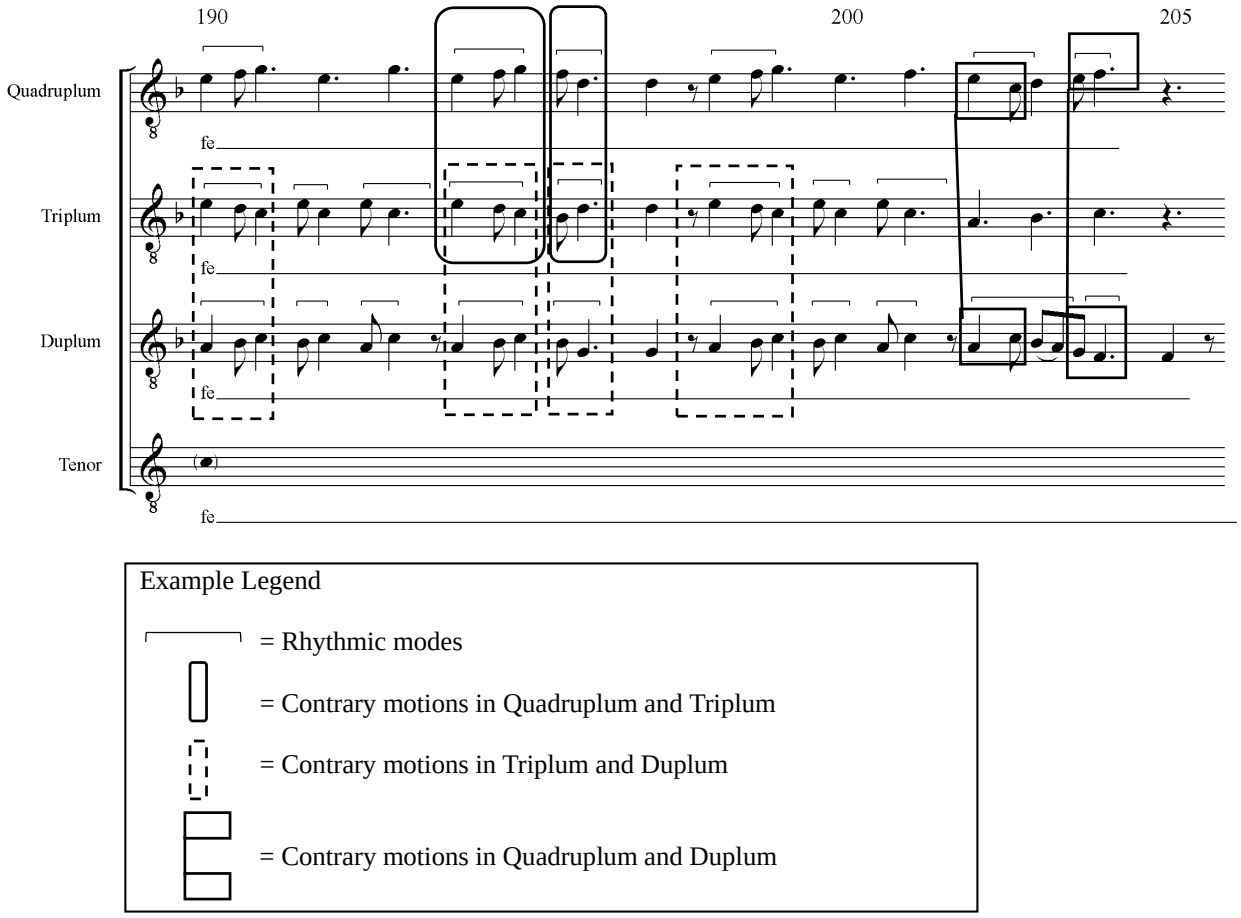
Translation: You of the father are the everlasting son.

Example 30: *Sit gloria domini*, in parallel organum at the fifth below, with octave doublings



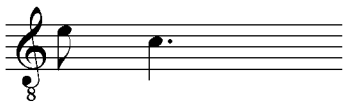
Translation: May the glory of the Lord be forever.

Example 31: Pérotin: *Viderunt omnes*, mm. 190–205



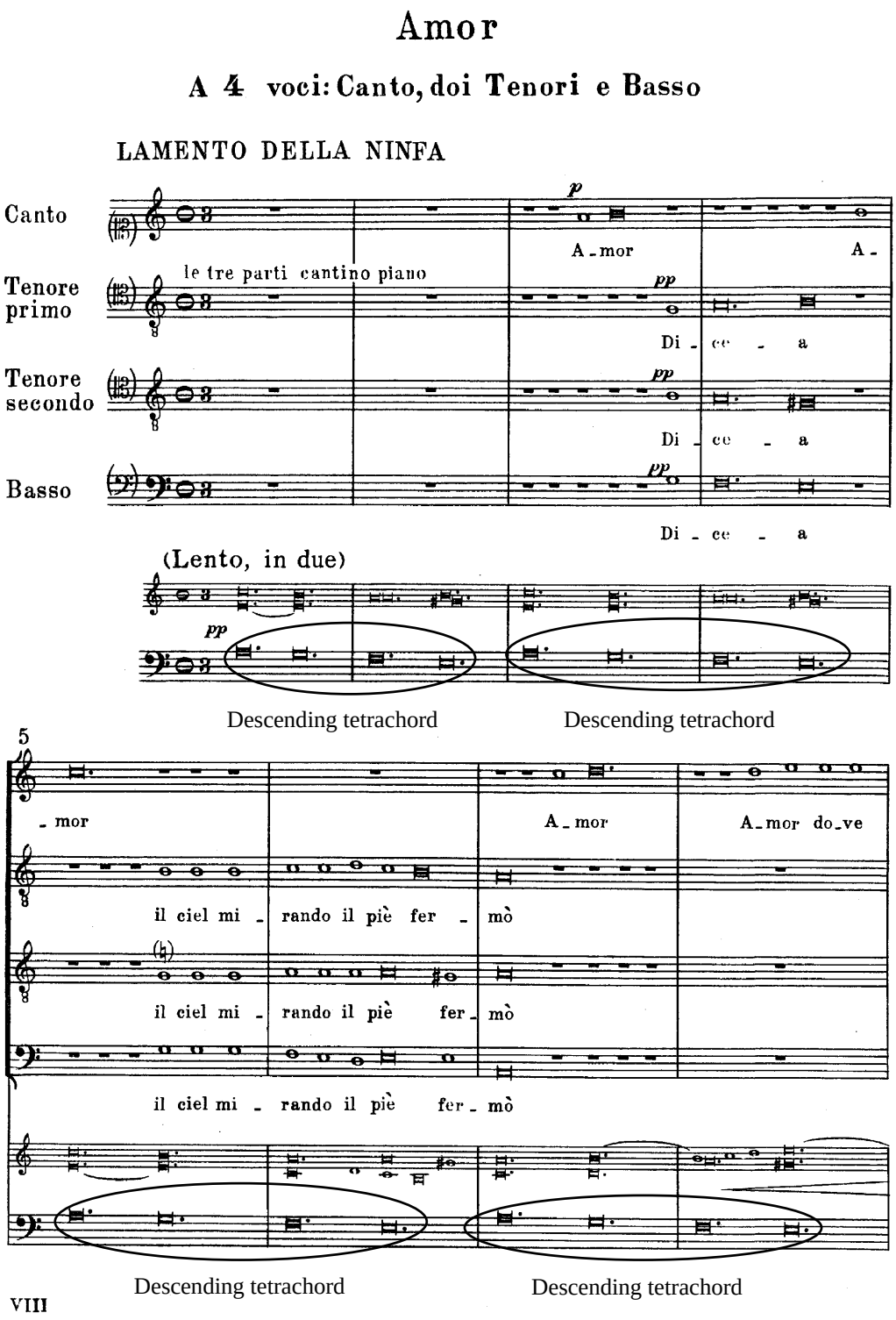
Example 32: Rhythmic mode without and with bar lines

(a) Without bar line

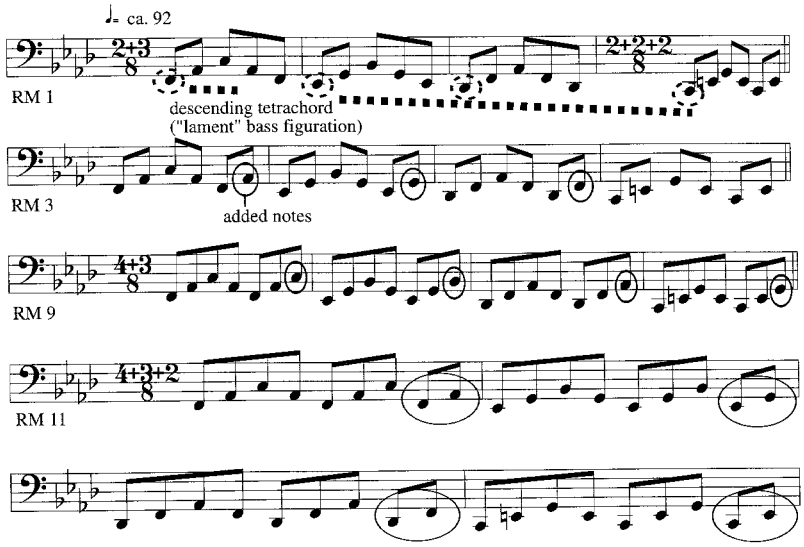


(b) With bar lines

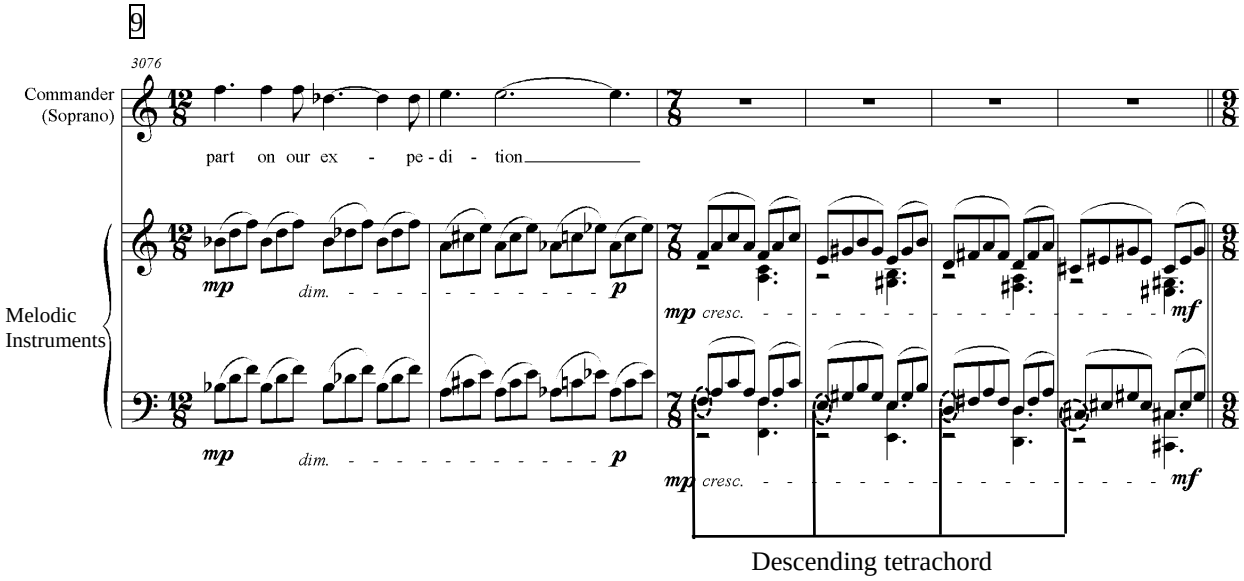
Example 33: Claudio Monteverdi: *Lamento della ninfa*, mm. 1–8



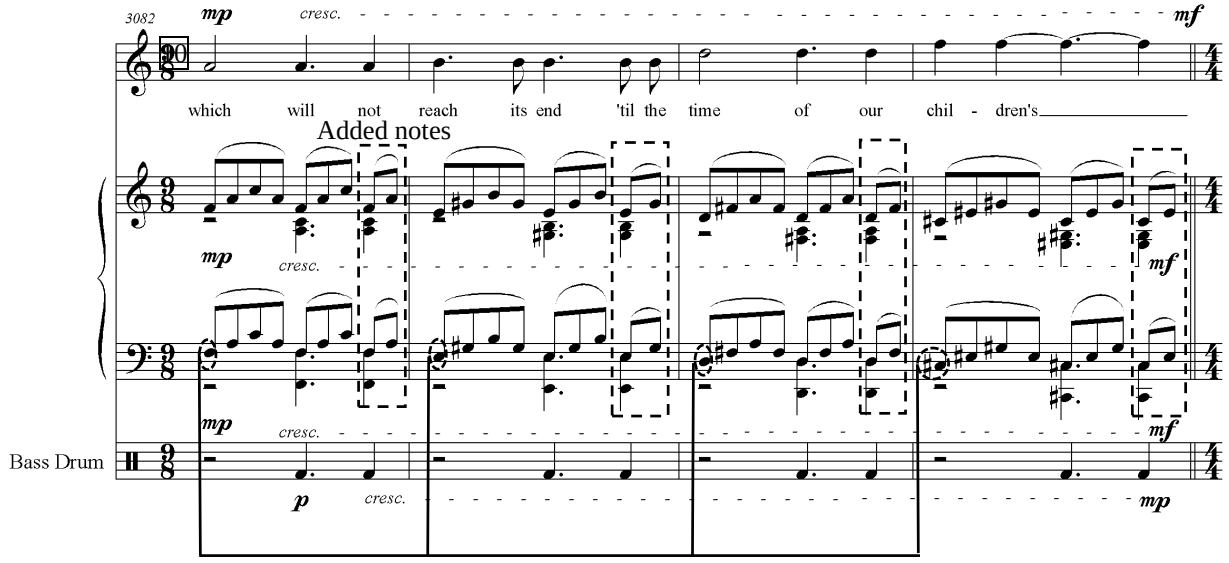
Example 34: Glass: *Satyagraha*, Act I Scene 1, descending tetrachord bass formula



Example 35: Glass: *The Voyage*, Act III Scene 2, mm. 3076–85, rr. 9–10

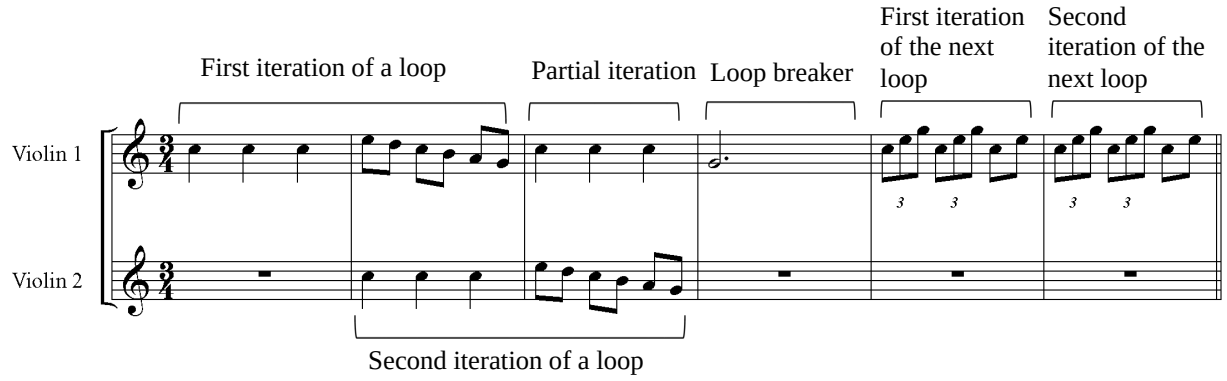


Example 35 (continued)

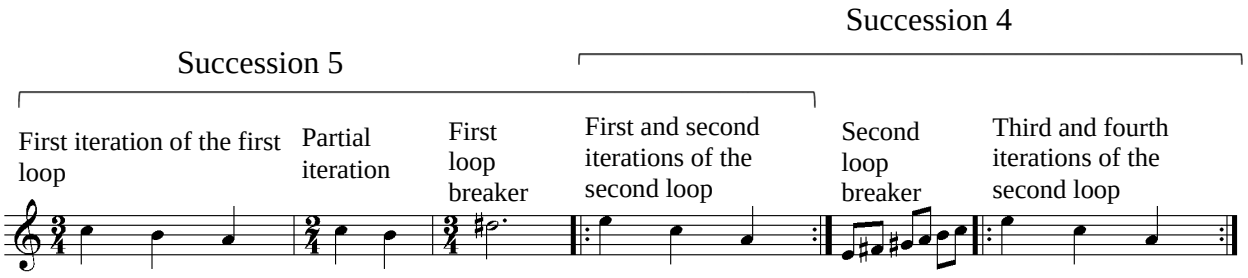


Descending tetrachord

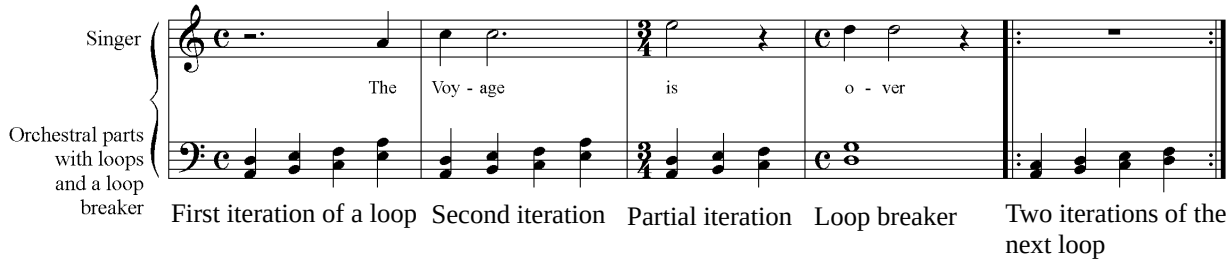
Example 36: Overlapping of the first, second, and partial iterations of a loop



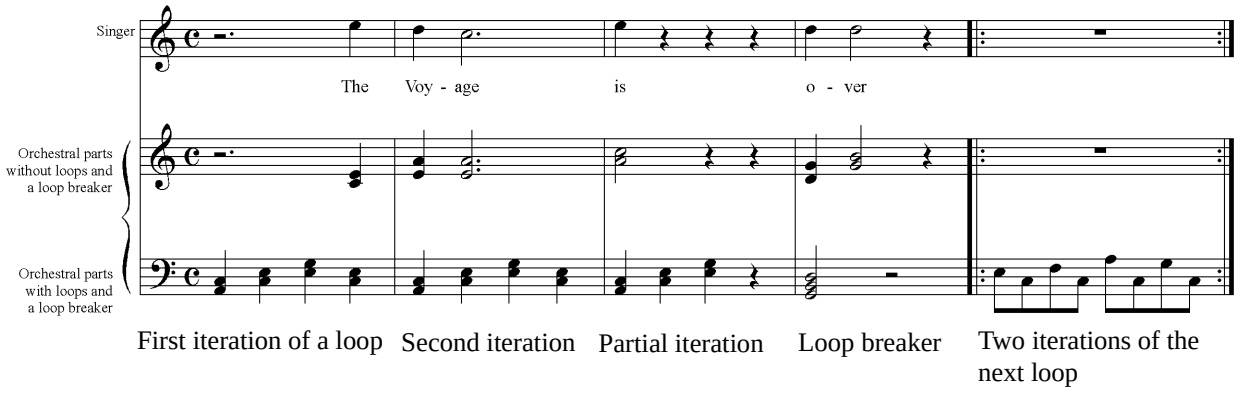
Example 37: An overlap between Succession 5 and Succession 4



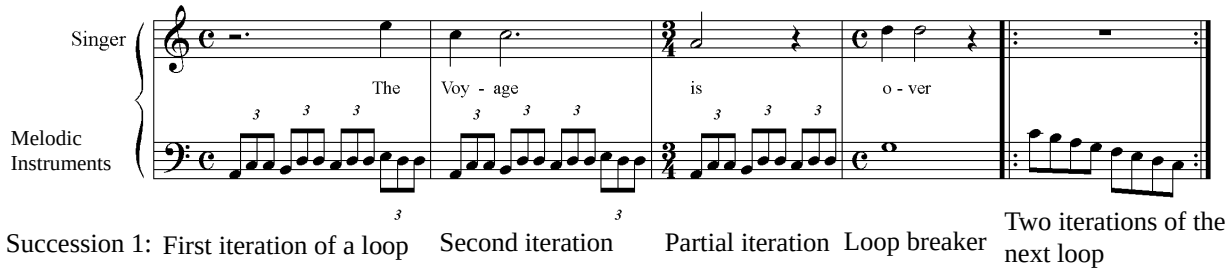
Example 38: Singer and orchestral loops and loop breaker



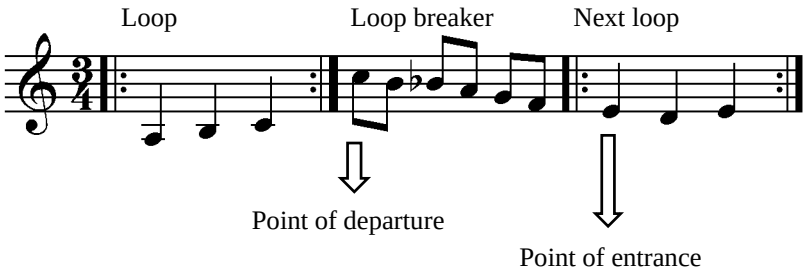
Example 39: Singer and two different orchestral parts



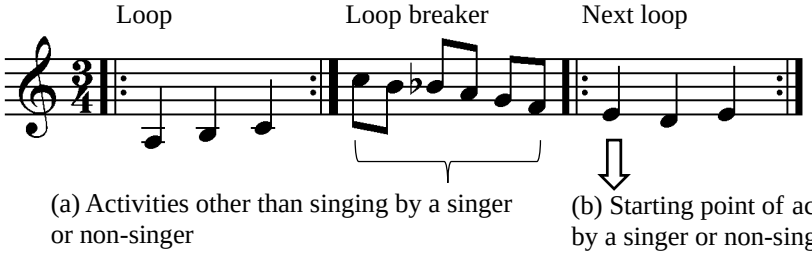
Example 40: Succession 1 shadows meanings of the words “the Voyage” and “over”



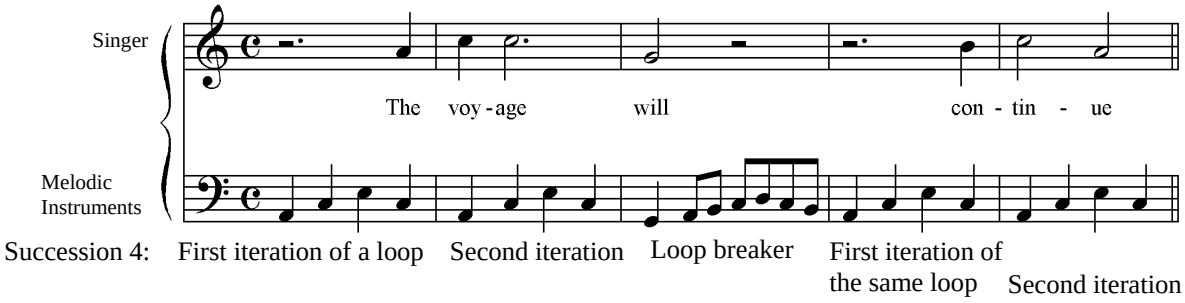
Example 41: Announcement of a singer’s point of departure or entrance



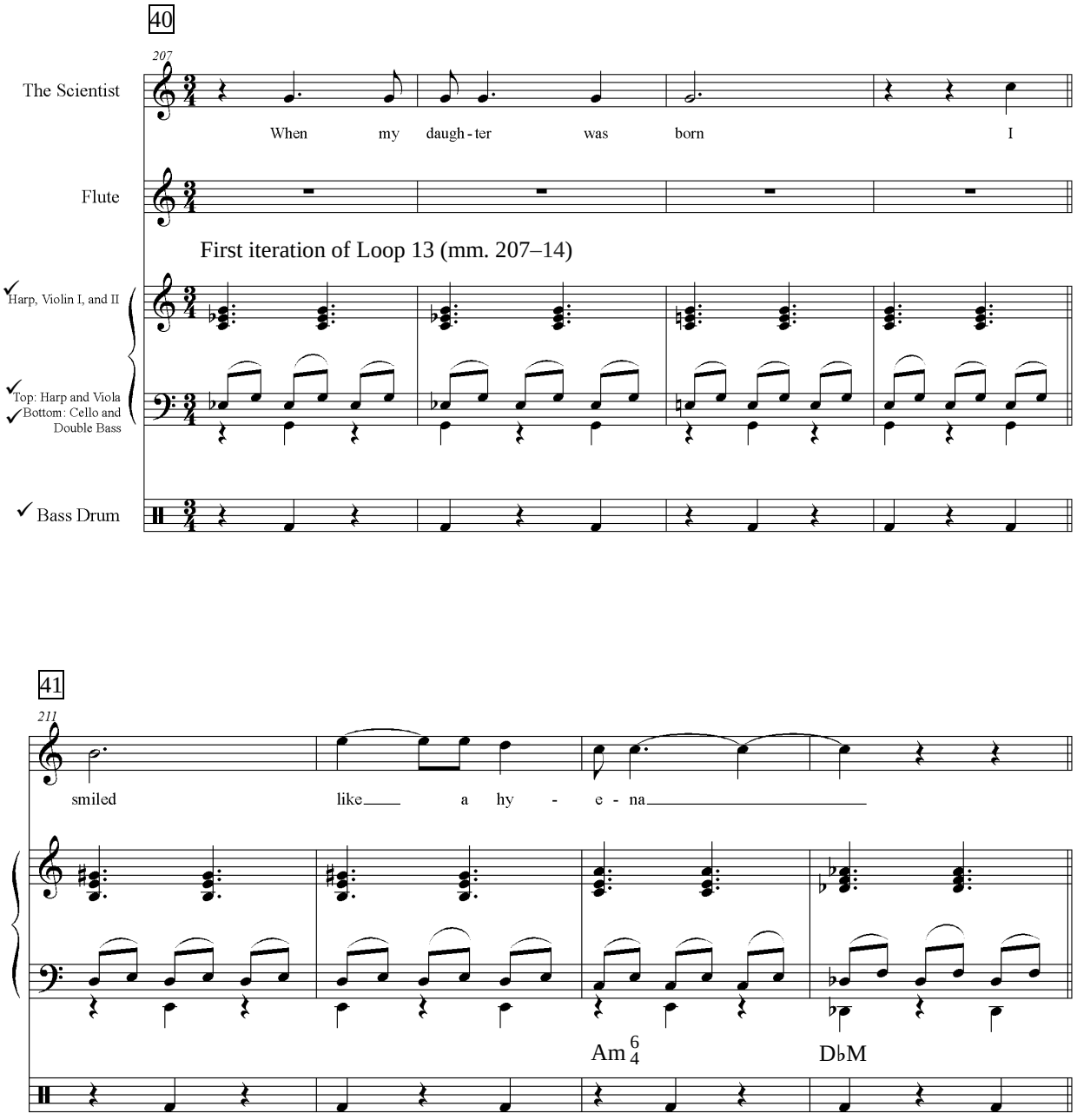
Example 42: Non-singing activities during a loop breaker or in the next loop



Example 43: Directing a listener’s attention to the word “continue” by using a loop breaker

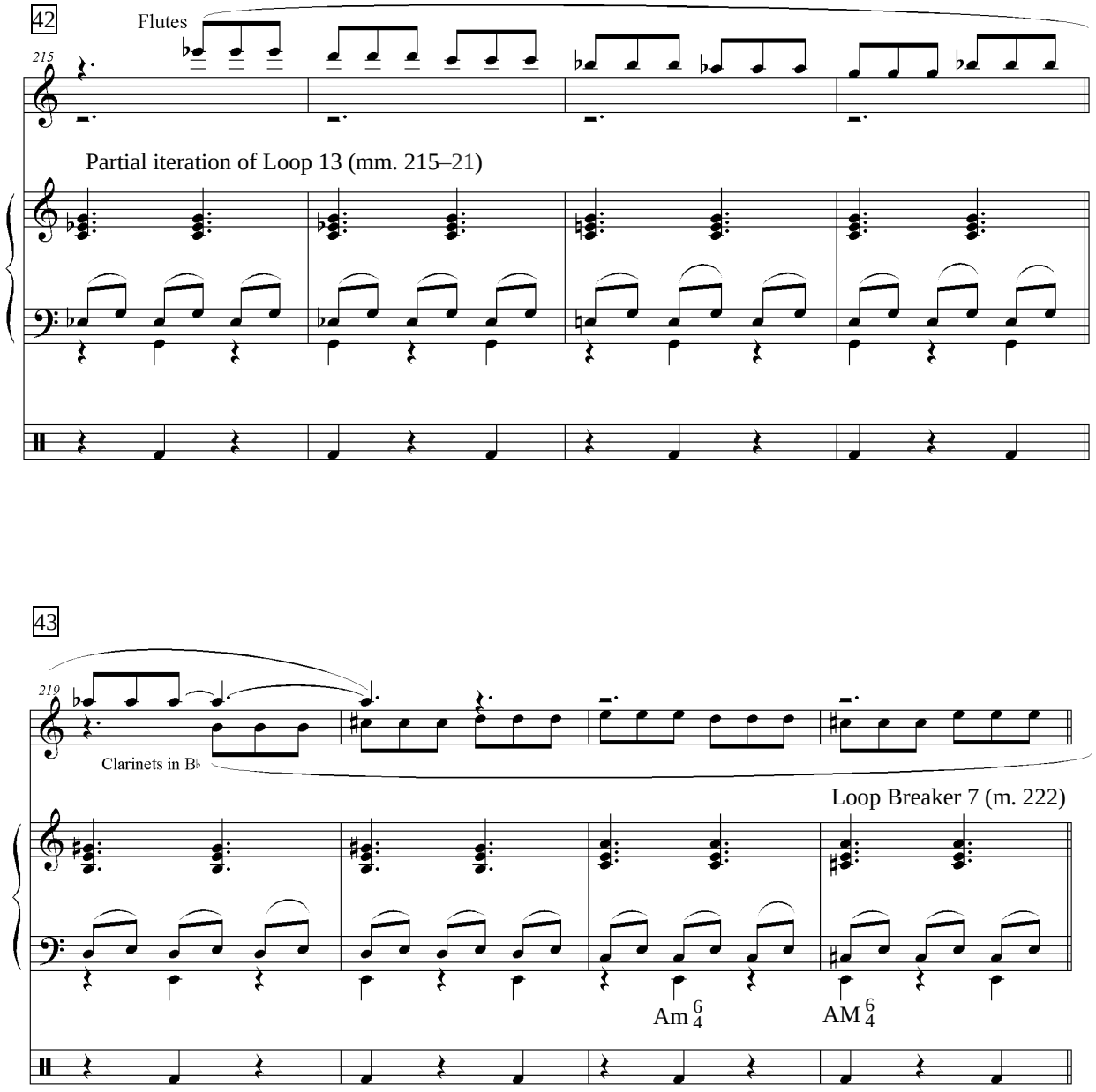


Example 44: Act I Prologue, mm. 207–38, rr. 40–47

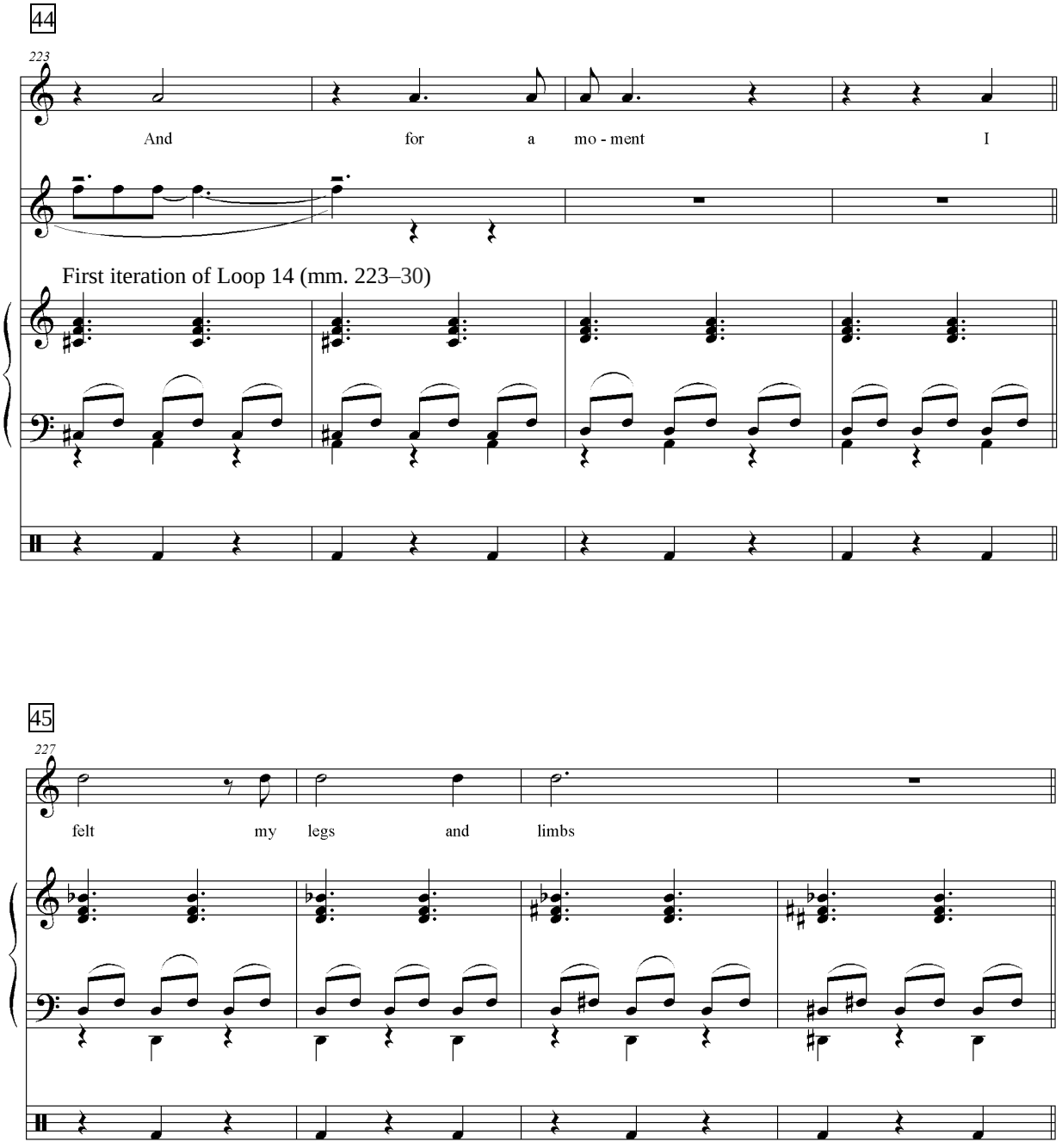


✓: Instruments forming Loop 13, Loop Breaker 7, and Loop 14

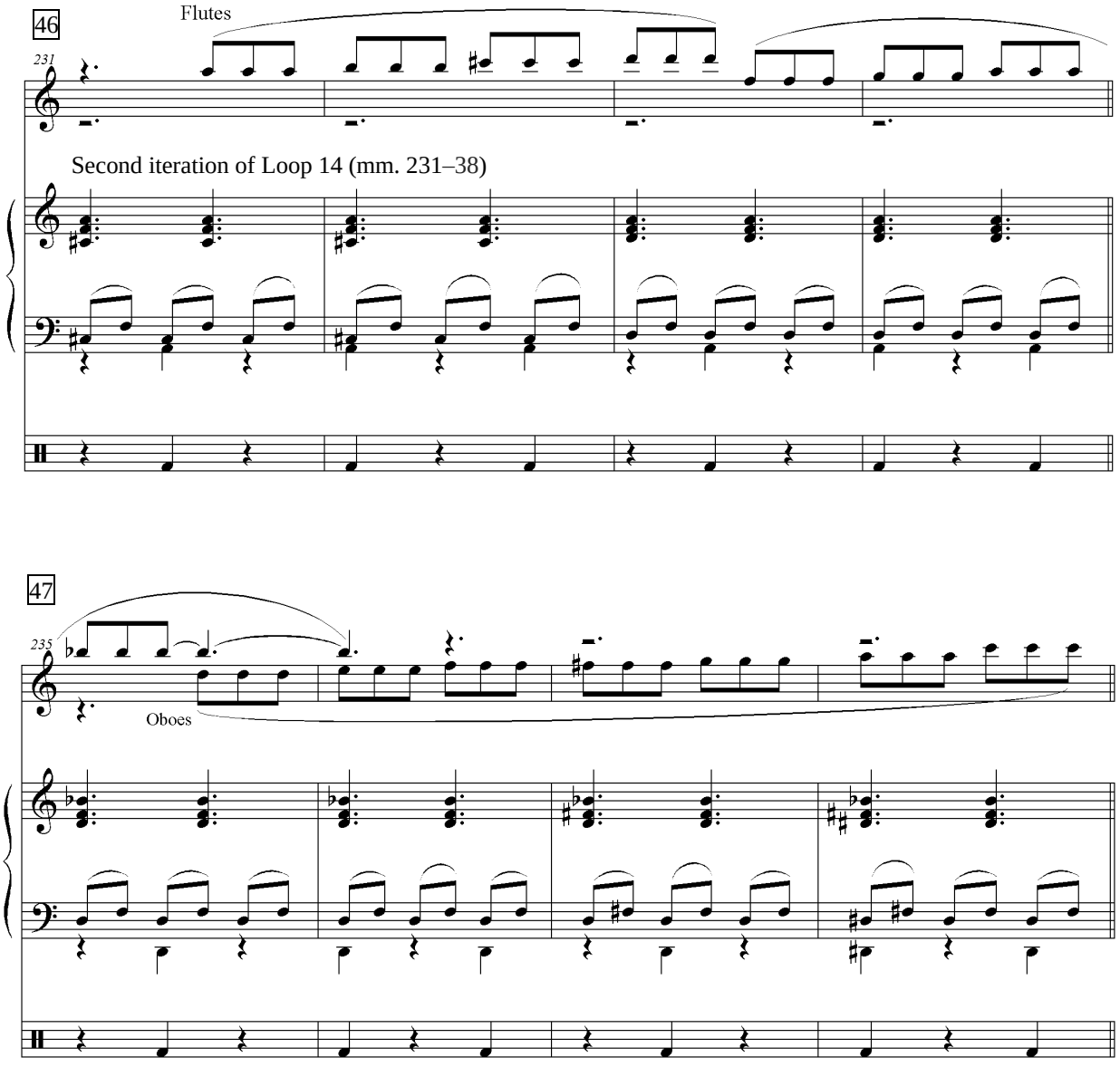
Example 44 (continued)



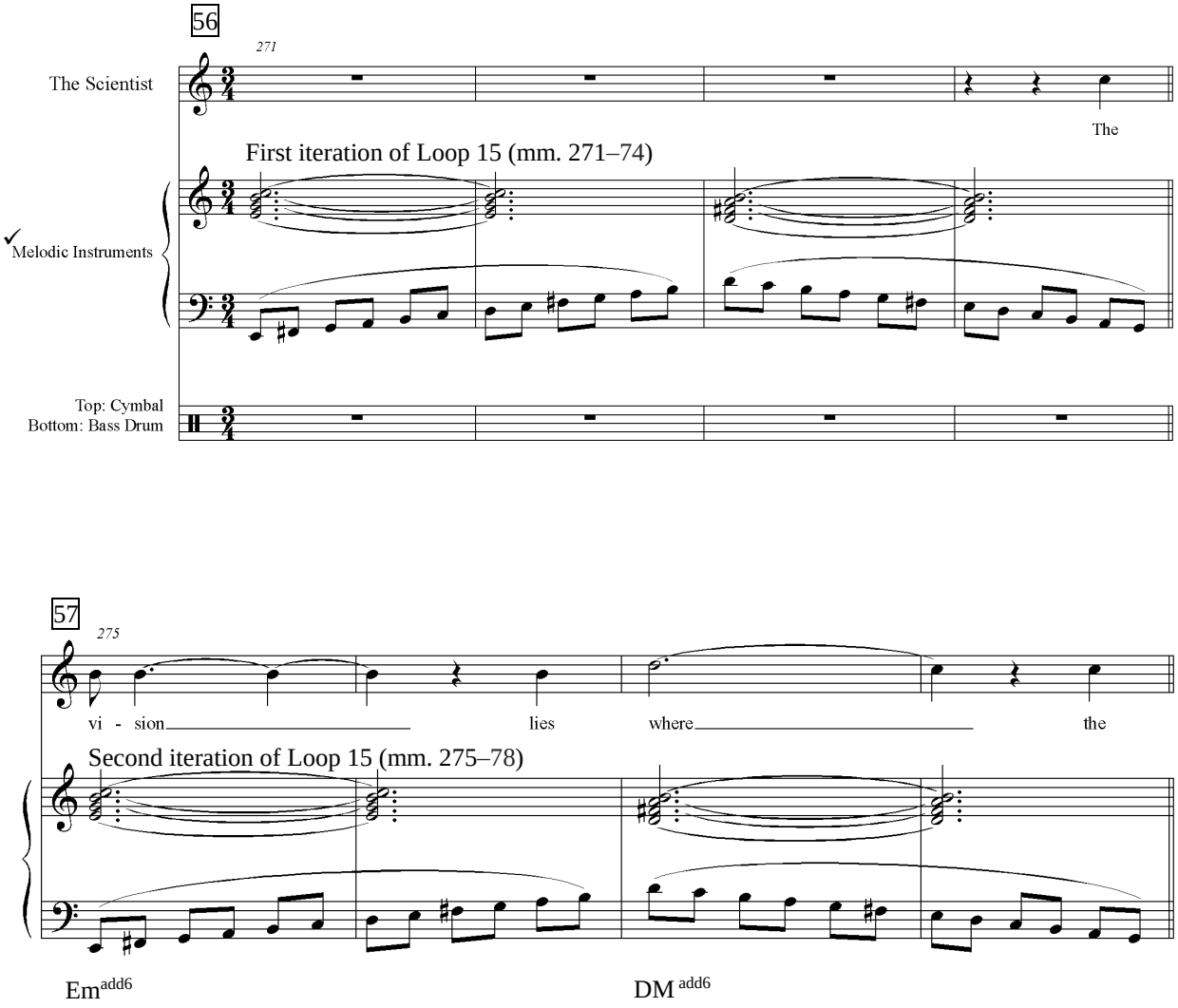
Example 44 (continued)



Example 44 (continued)

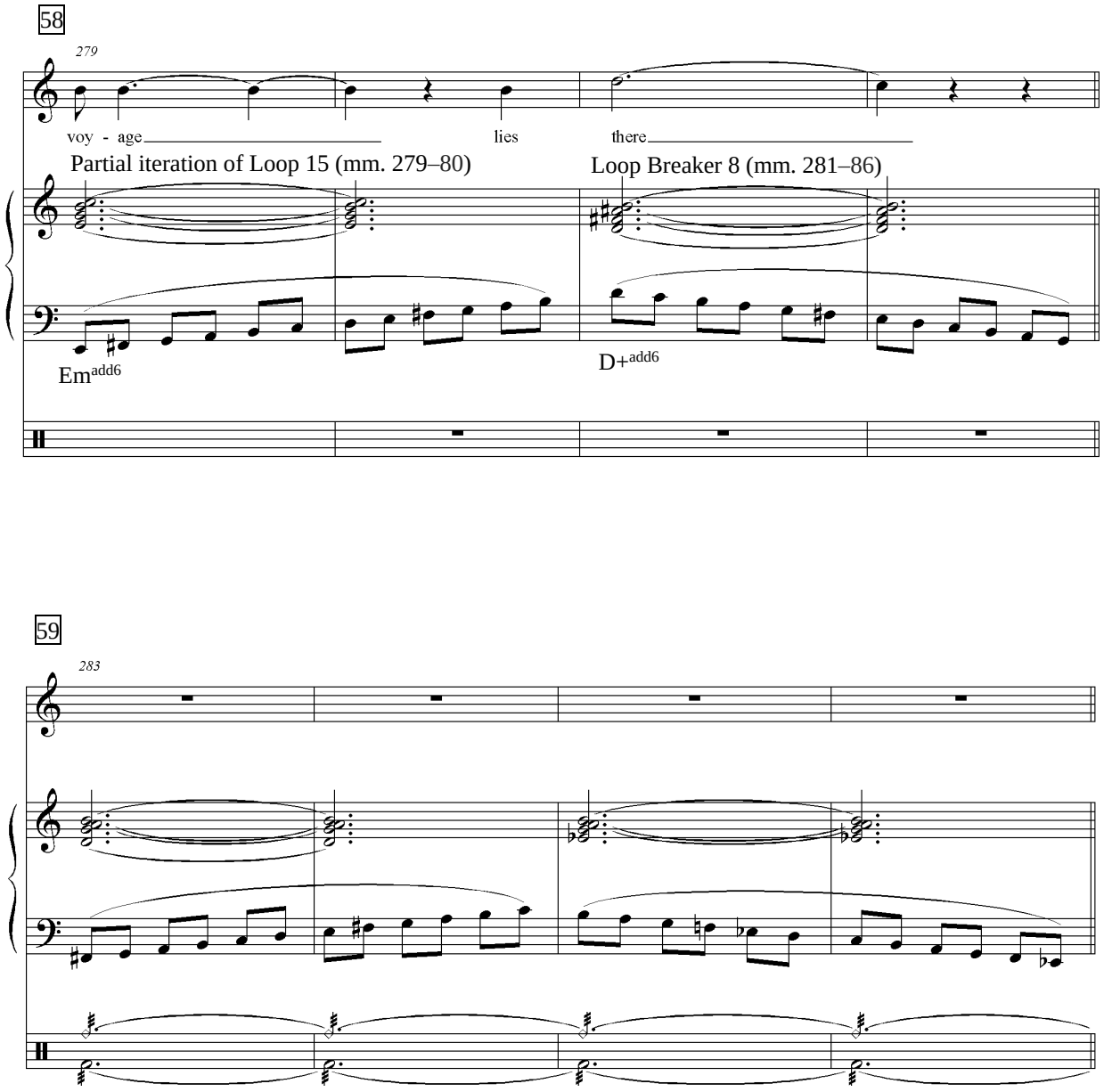


Example 45: Act I Prologue, mm. 271–94, rr. 56–61

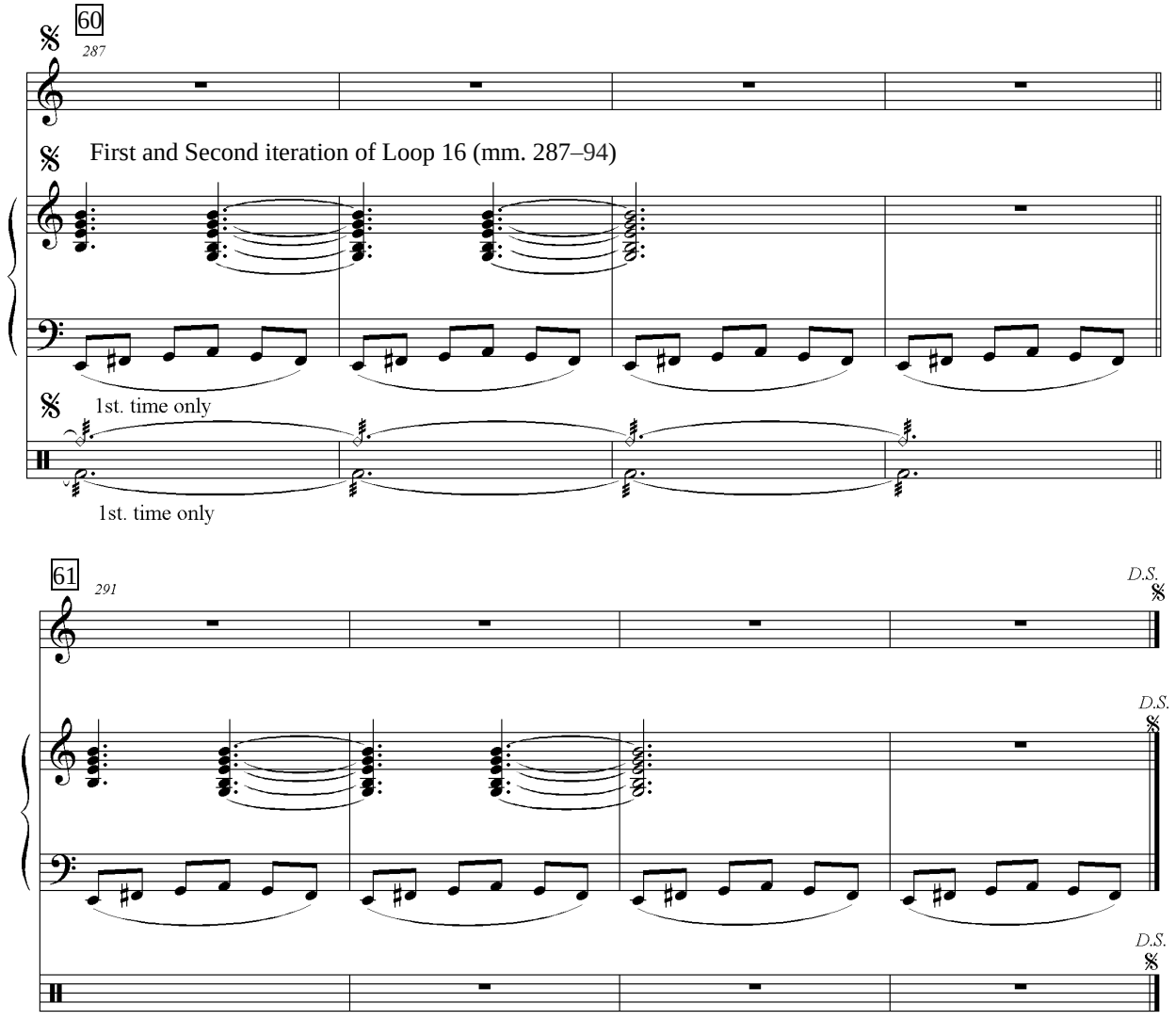


✓: Instruments forming Loop 15, Loop Breaker 8, and Loop 16

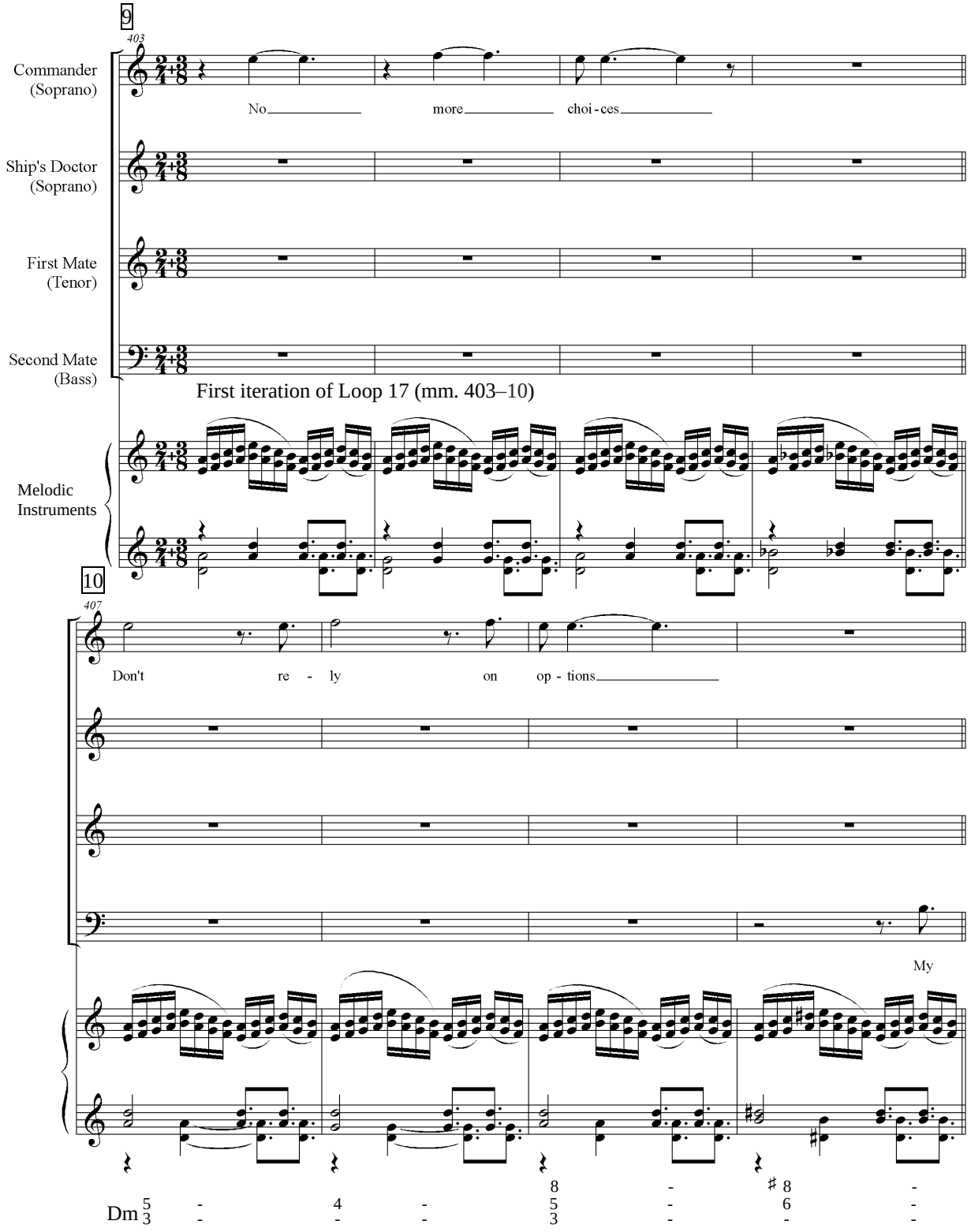
Example 45 (continued)



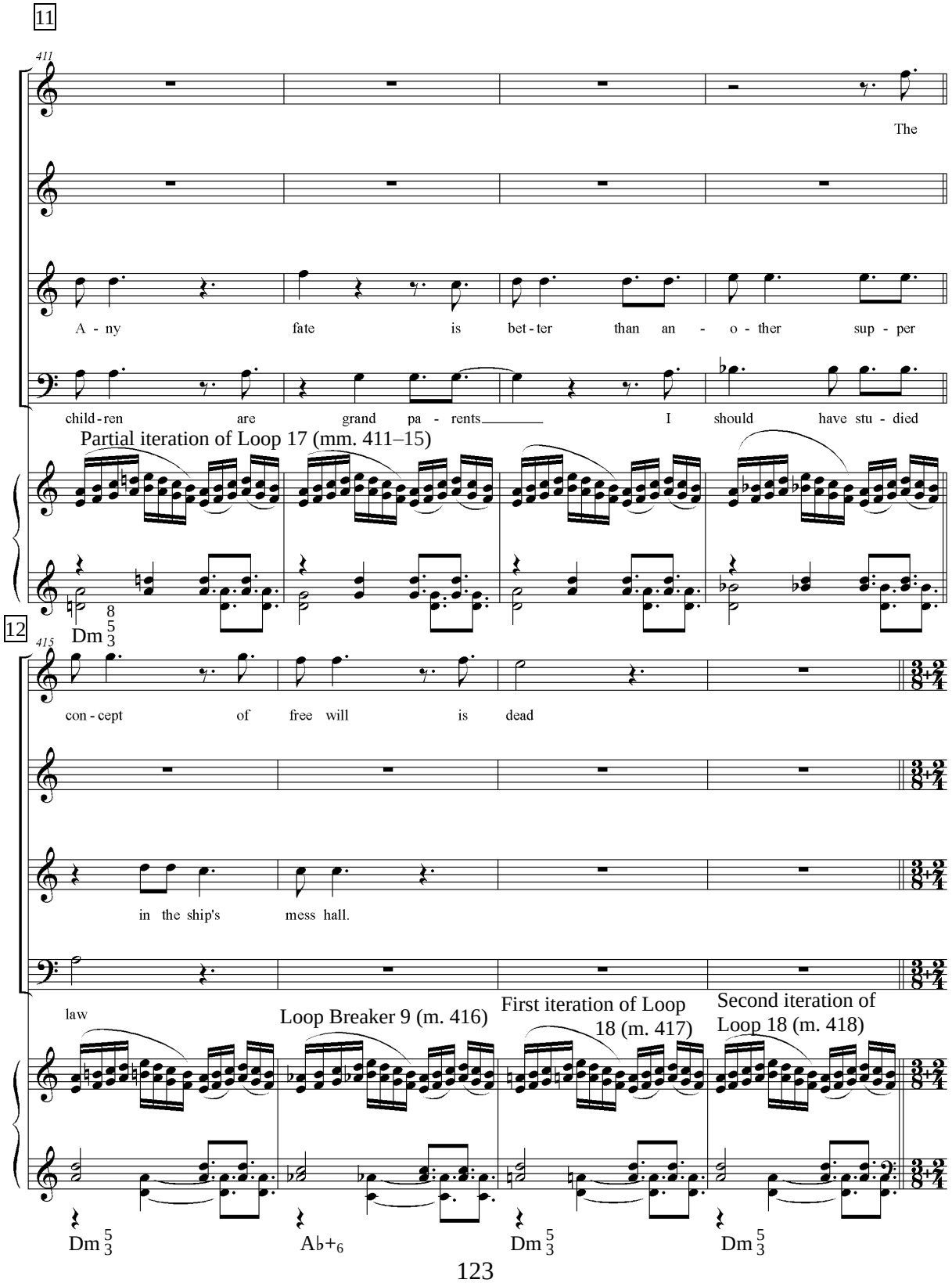
Example 45 (continued)



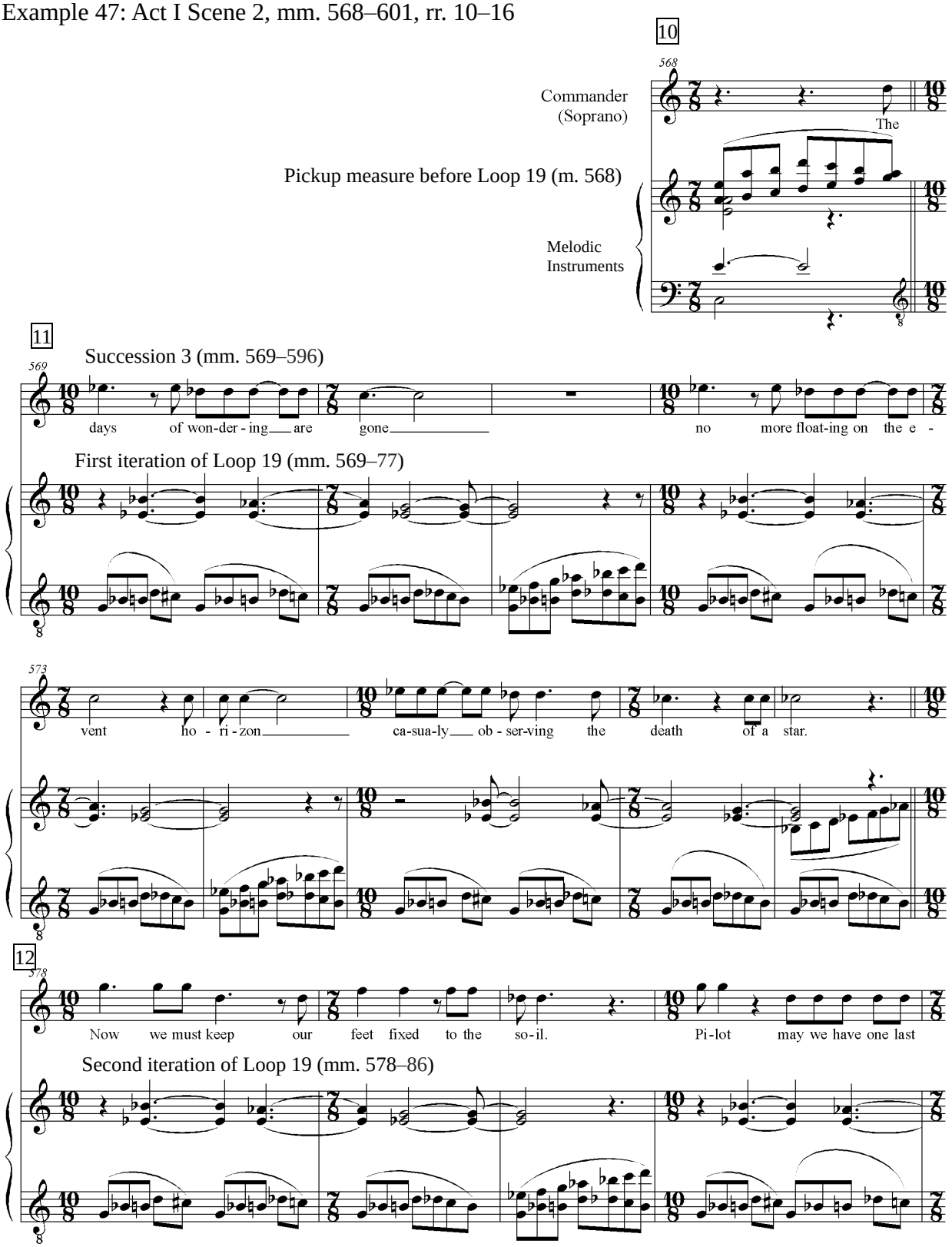
Example 46: Act I Scene 1, mm. 403–18, rr. 9–12



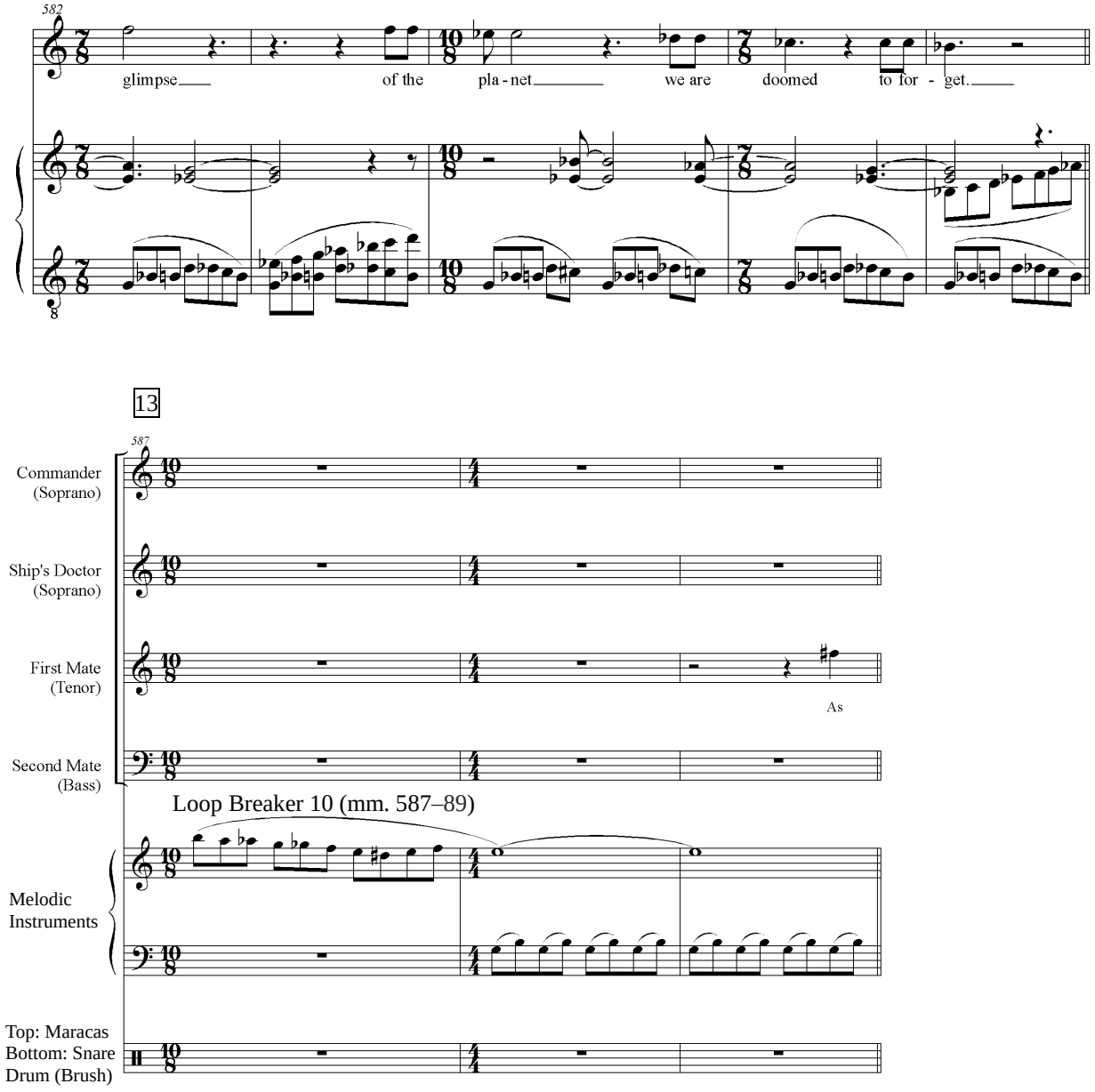
Example 46 (continued)



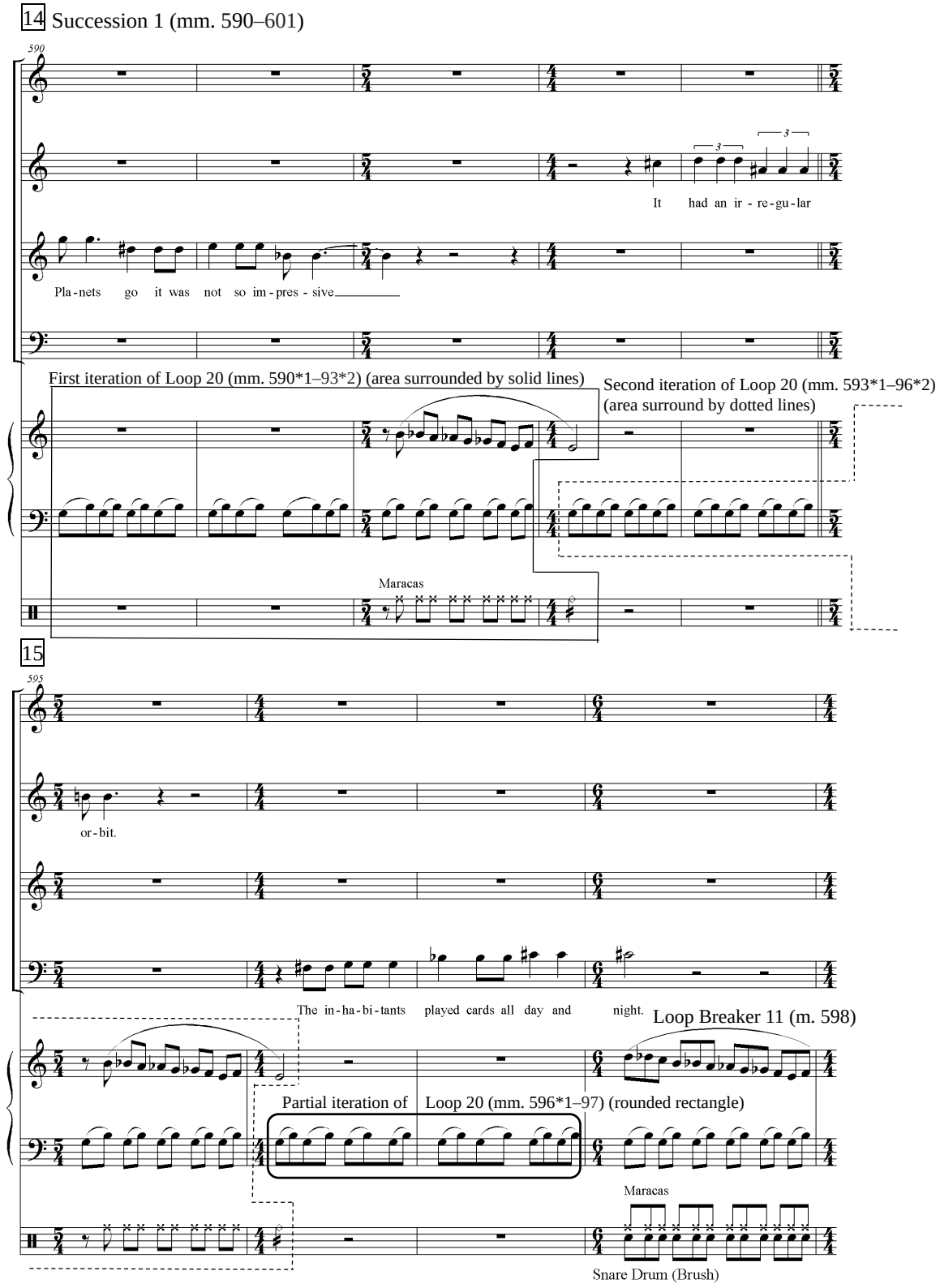
Example 47: Act I Scene 2, mm. 568–601, rr. 10–16



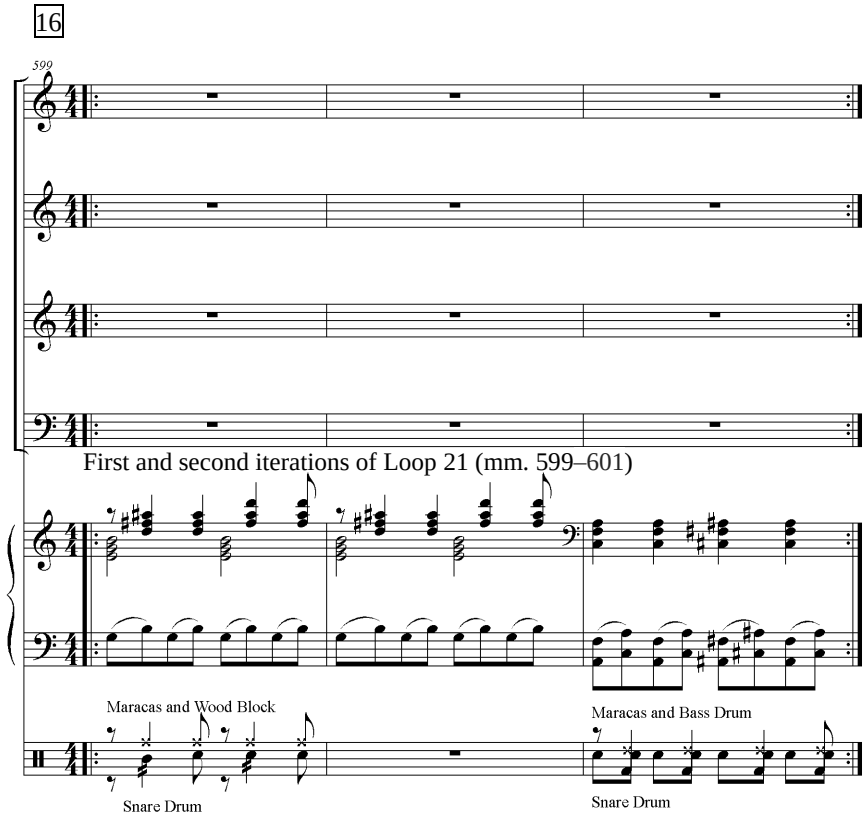
Example 47 (continued)



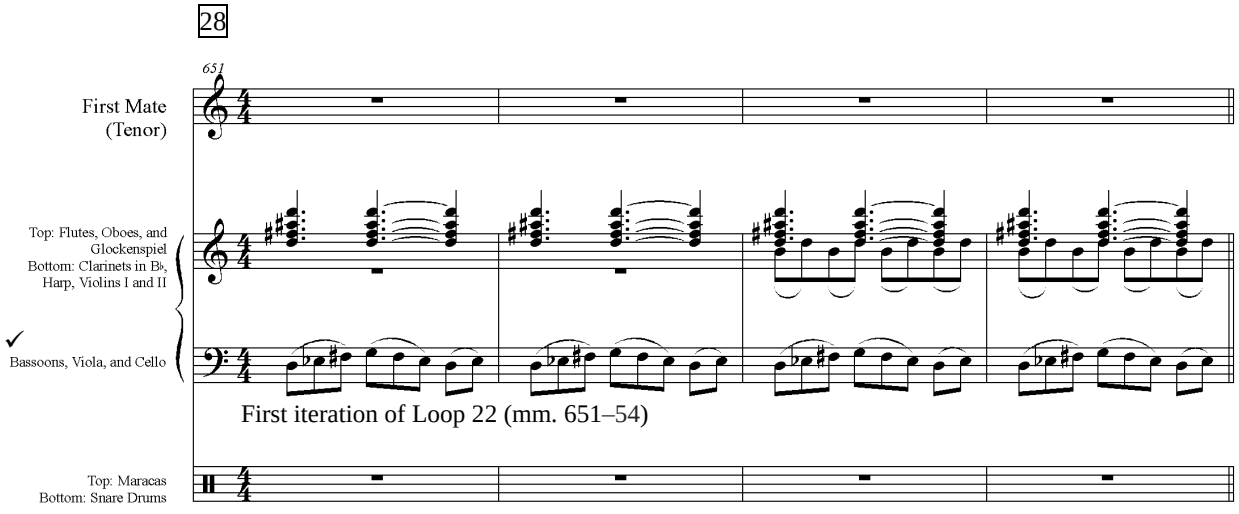
Example 47 (continued)



Example 47 (continued)

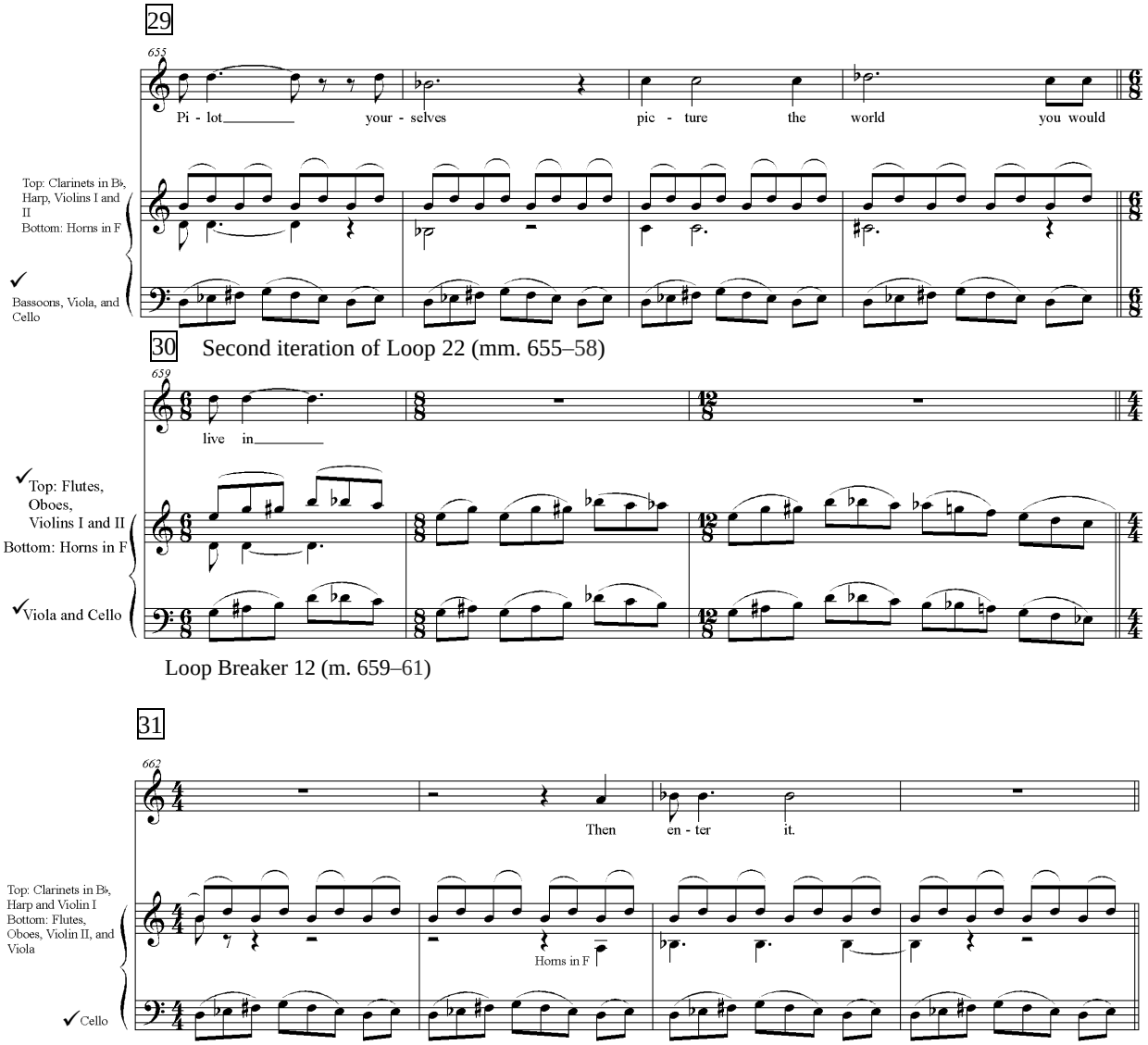


Example 48: Act I Scene 2, mm. 651–70, rr. 28–33

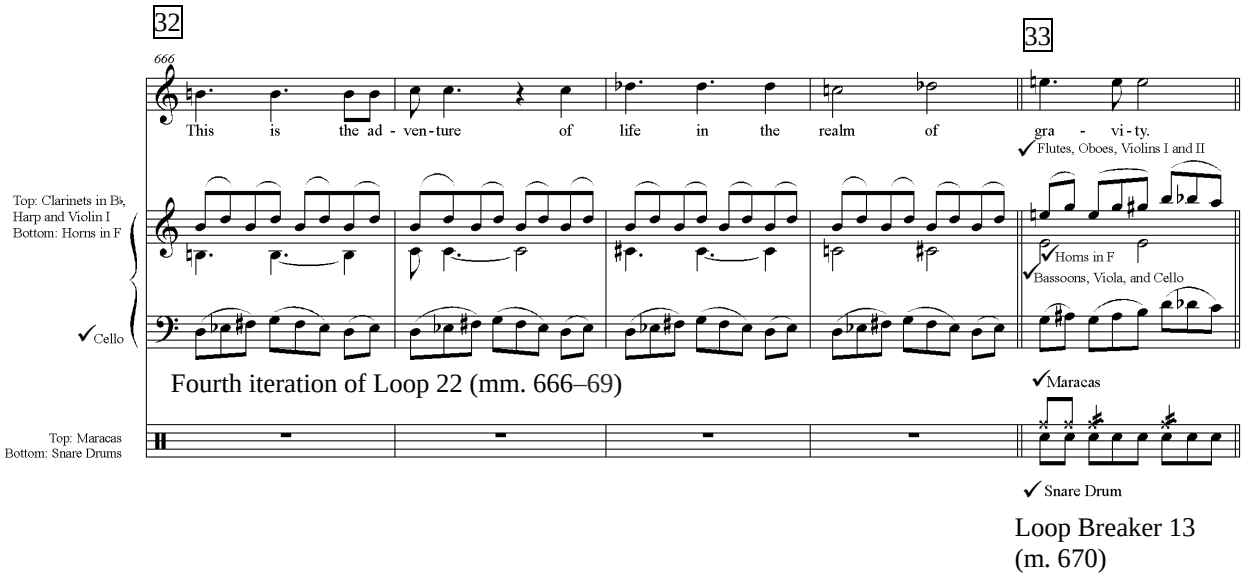


✓: Instruments forming Loop 22, Loop Breakers 12, and 13

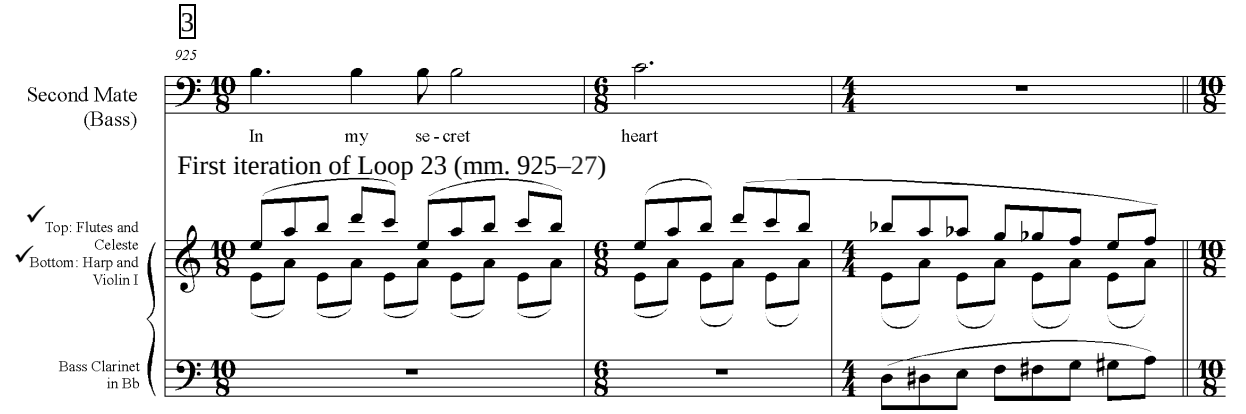
Example 48 (continued)



Example 48 (continued)

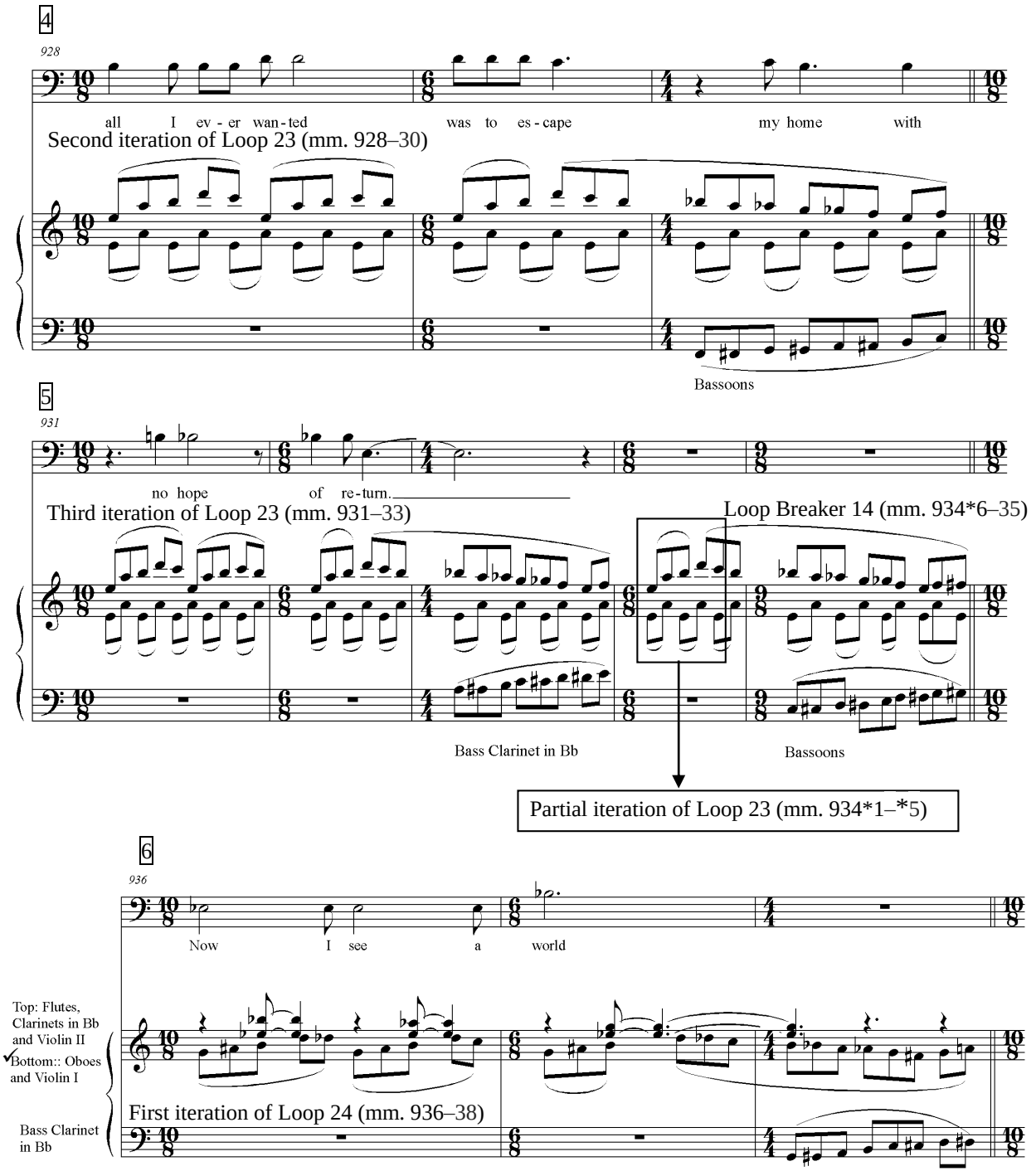


Example 49: Act I Scene 2 Conclusion, mm. 925–44, rr. 3–8

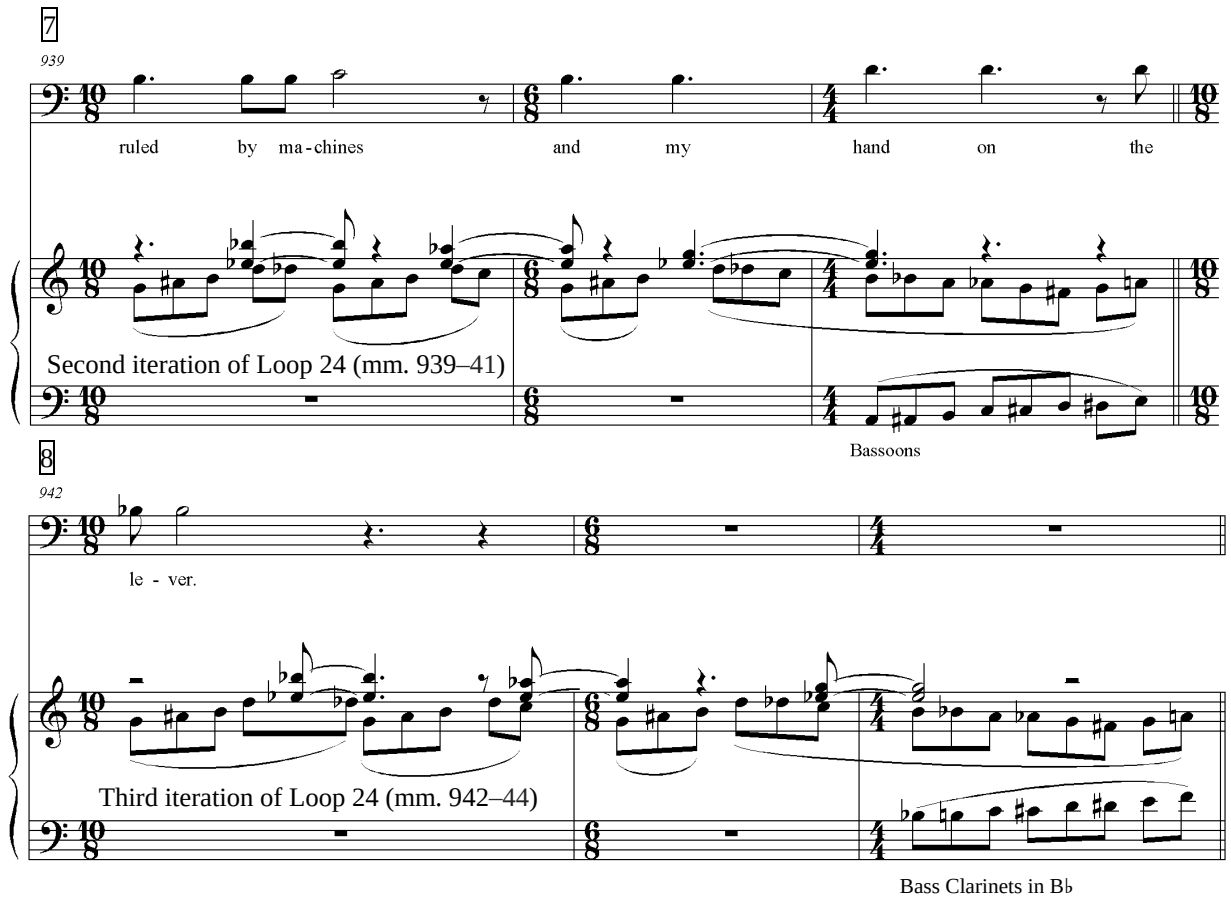


✓: Instruments forming Loop 23, Loop Breaker 14, and Loop 24

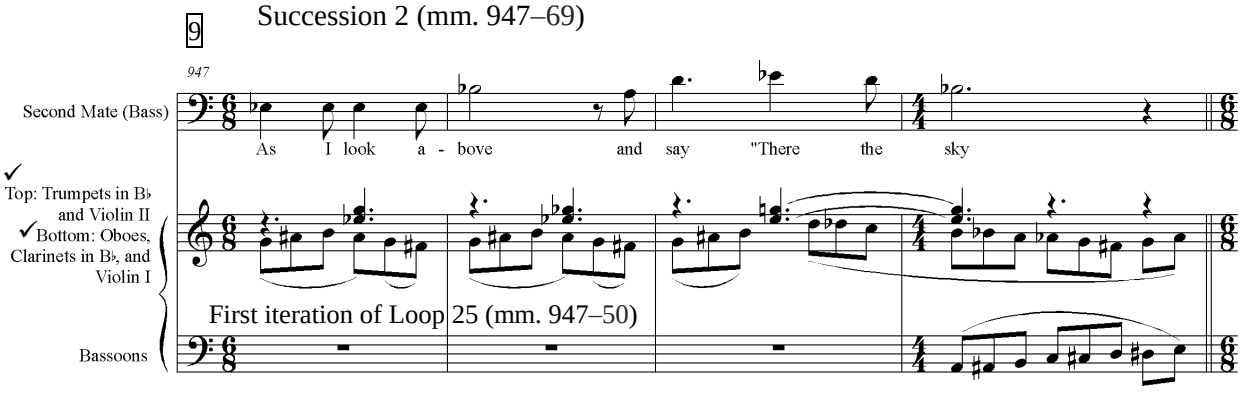
Example 49 (continued)



Example 49 (continued)

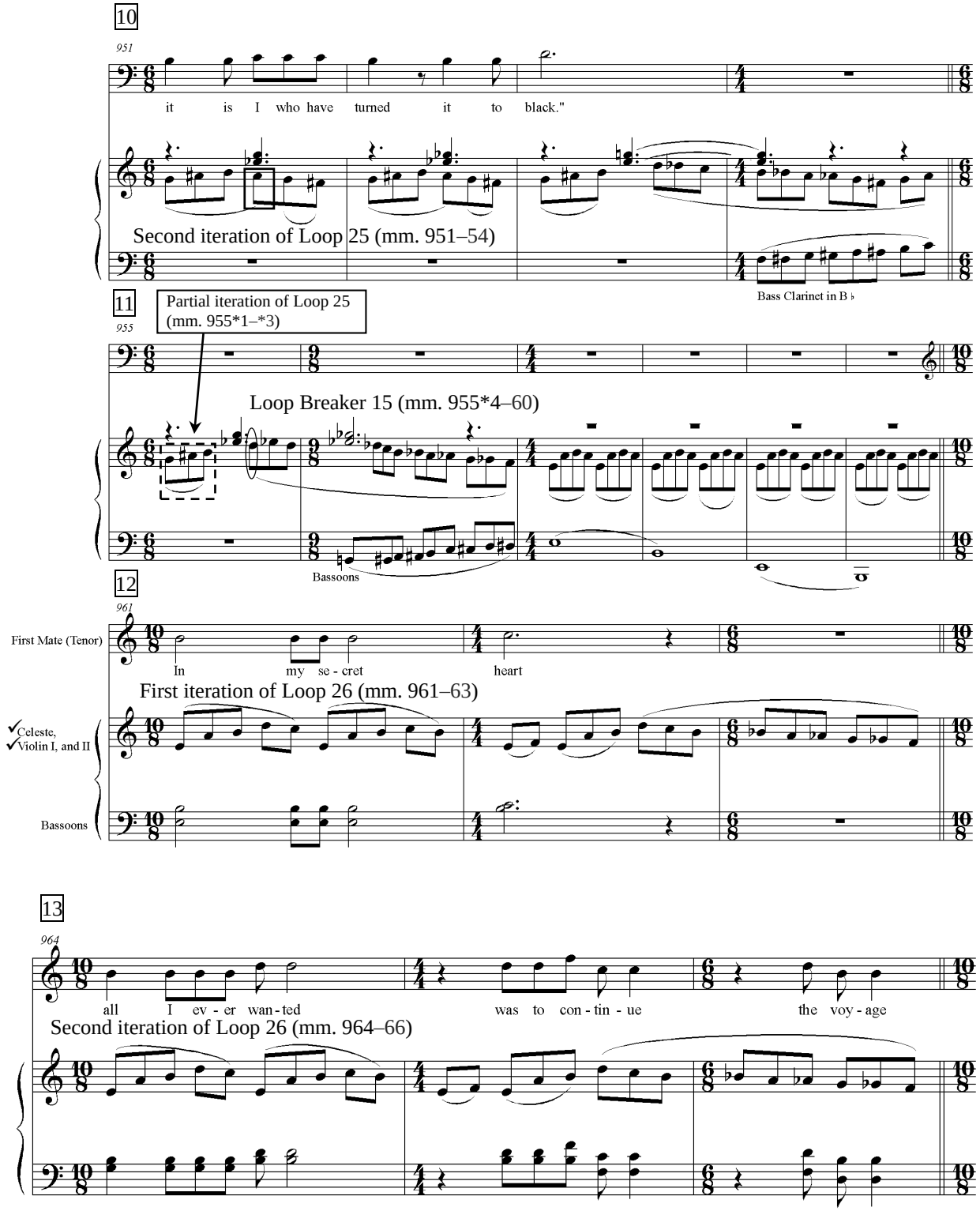


Example 50: Act I Scene 2 Conclusion, mm. 947–82, rr. 9–18

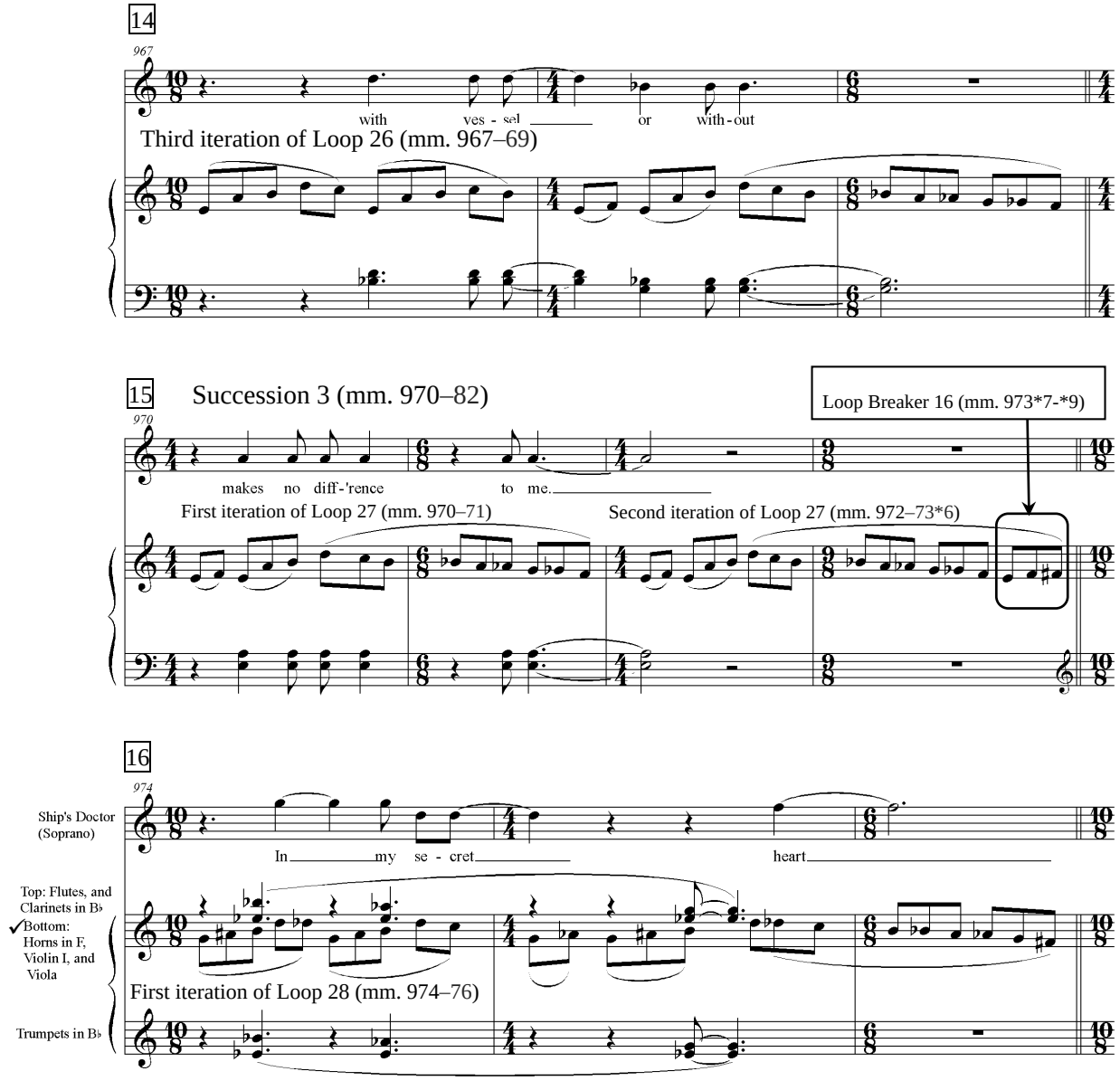


✓: Instruments forming Loops 25, 26, 27, and 28; Loop Breakers 15 and 16

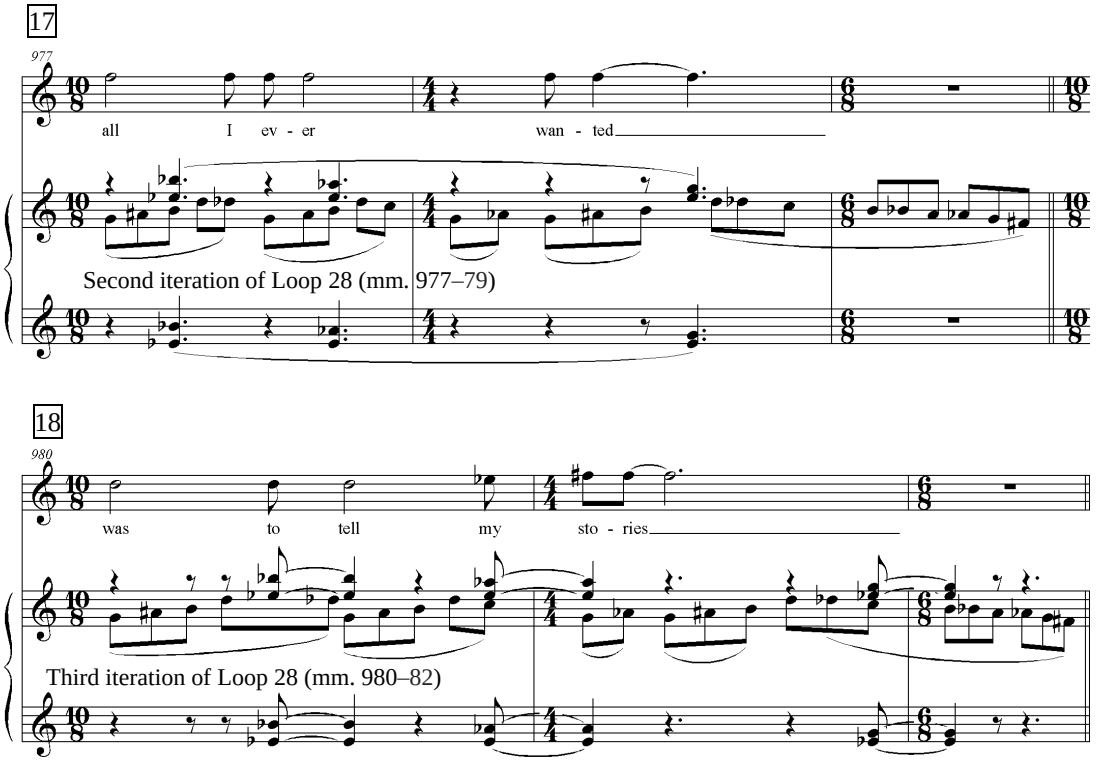
Example 50 (continued)



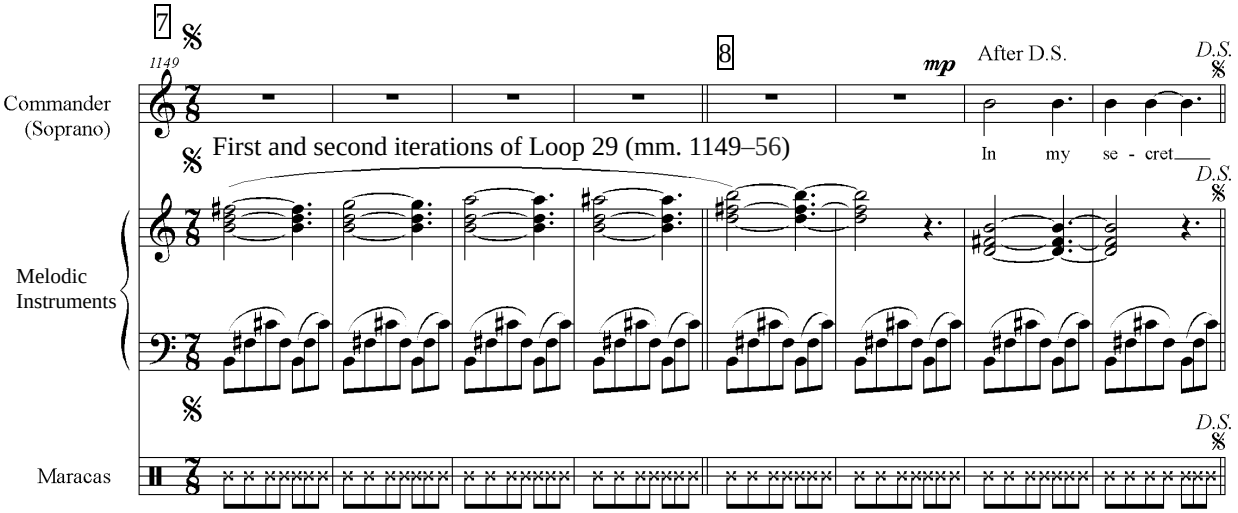
Example 50 (continued)



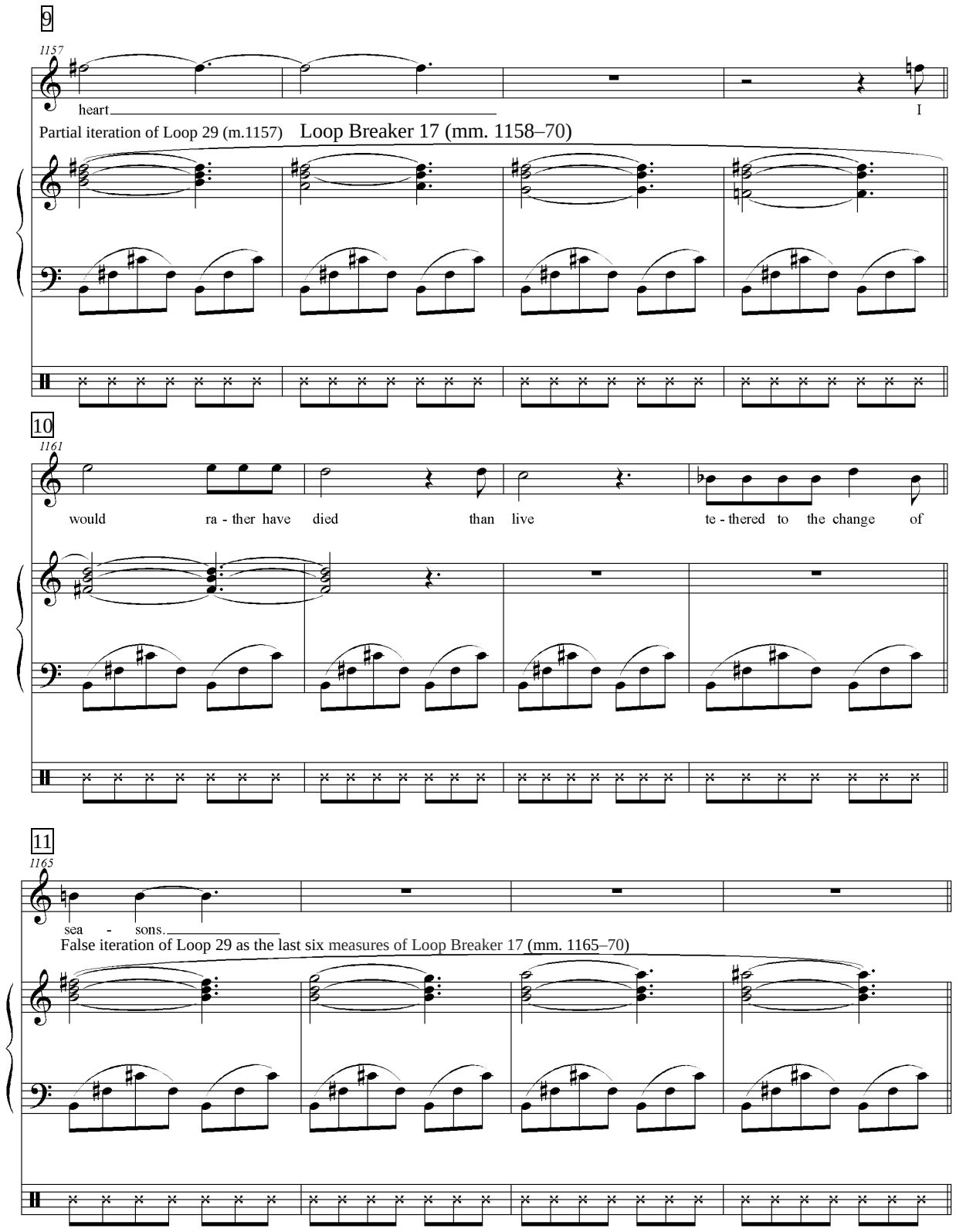
Example 50 (continued)



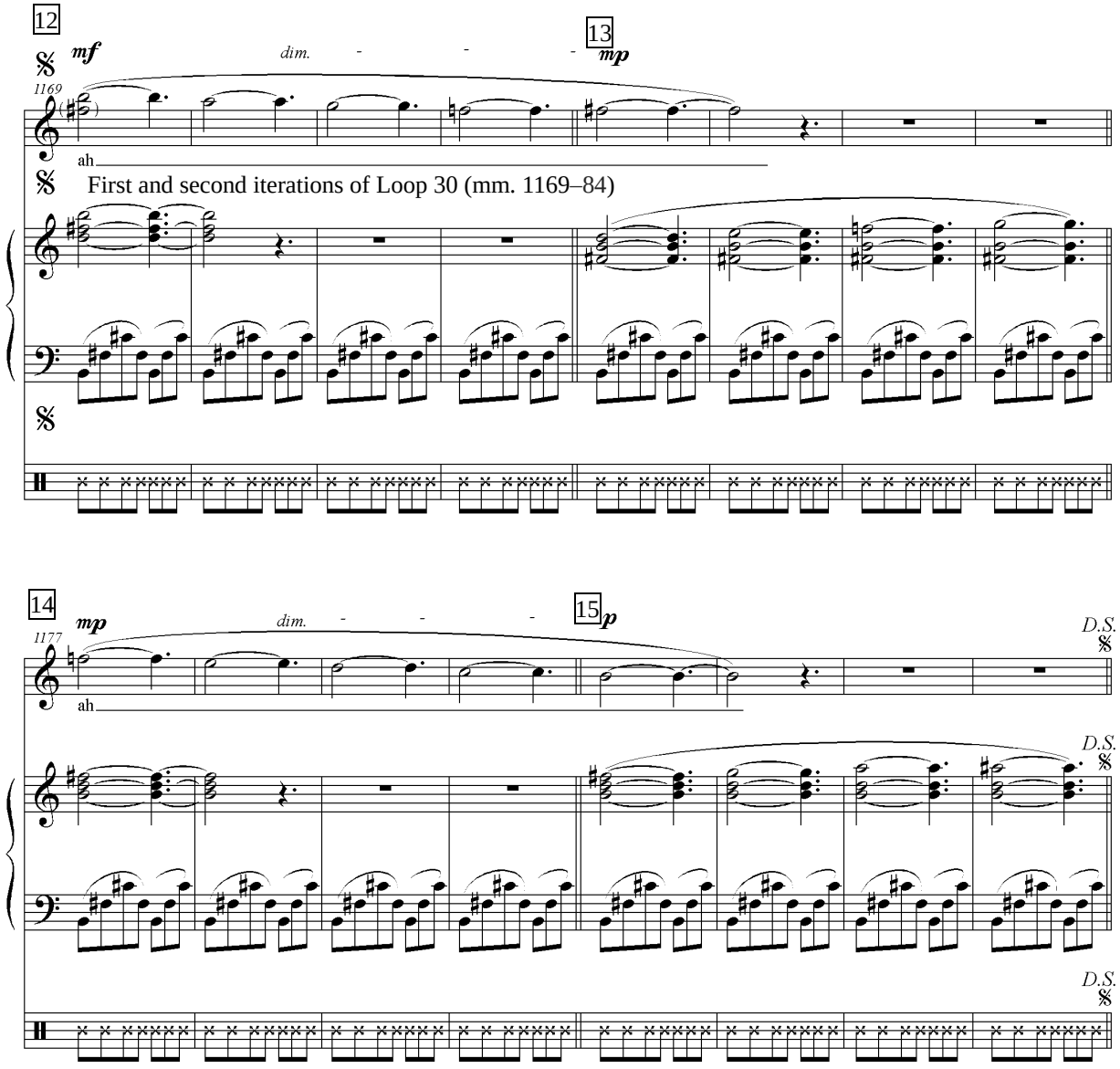
Example 51: Act I Scene 3, mm. 1149–84, rr. 7–15



Example 51 (continued)

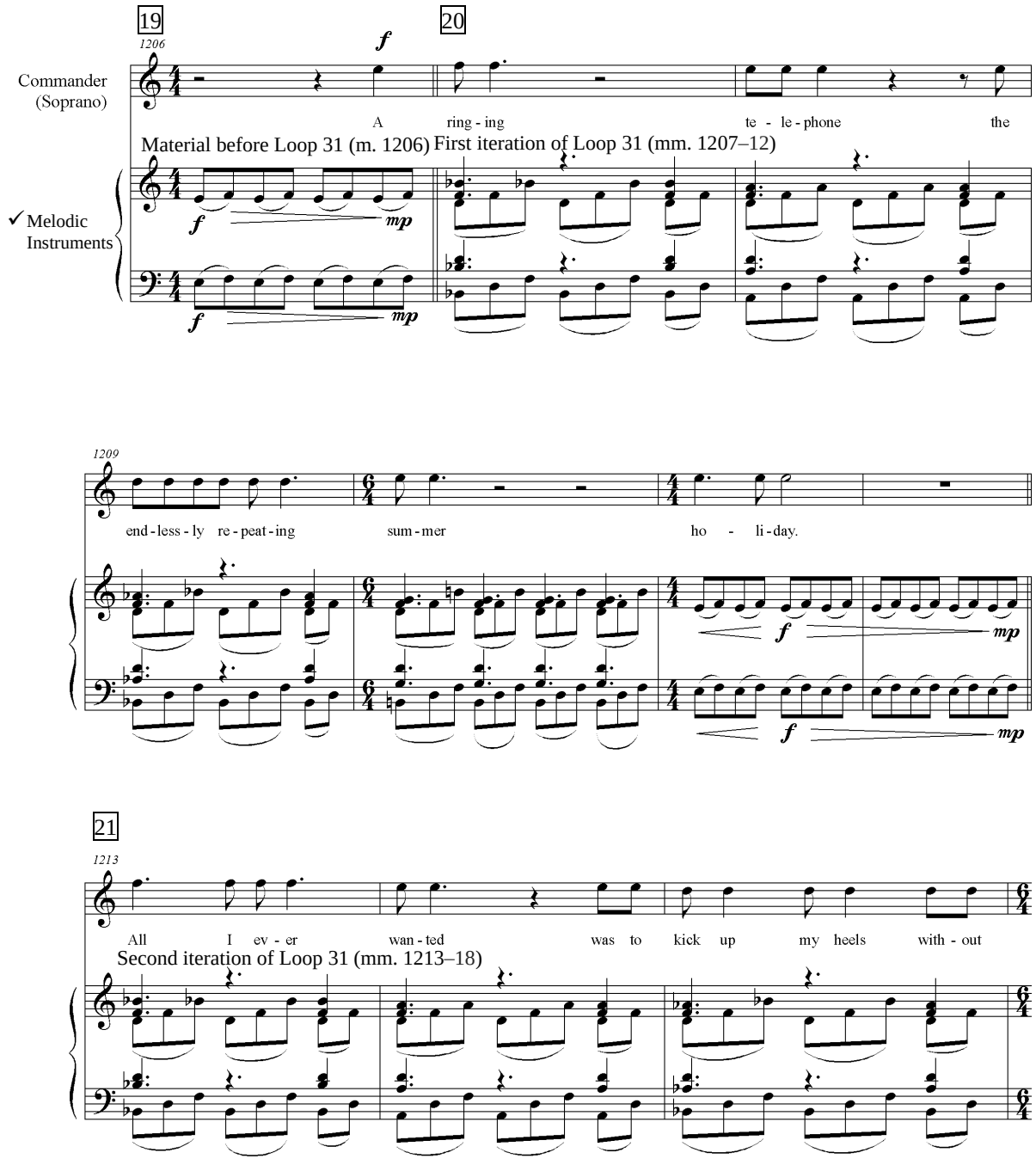


Example 51 (continued)



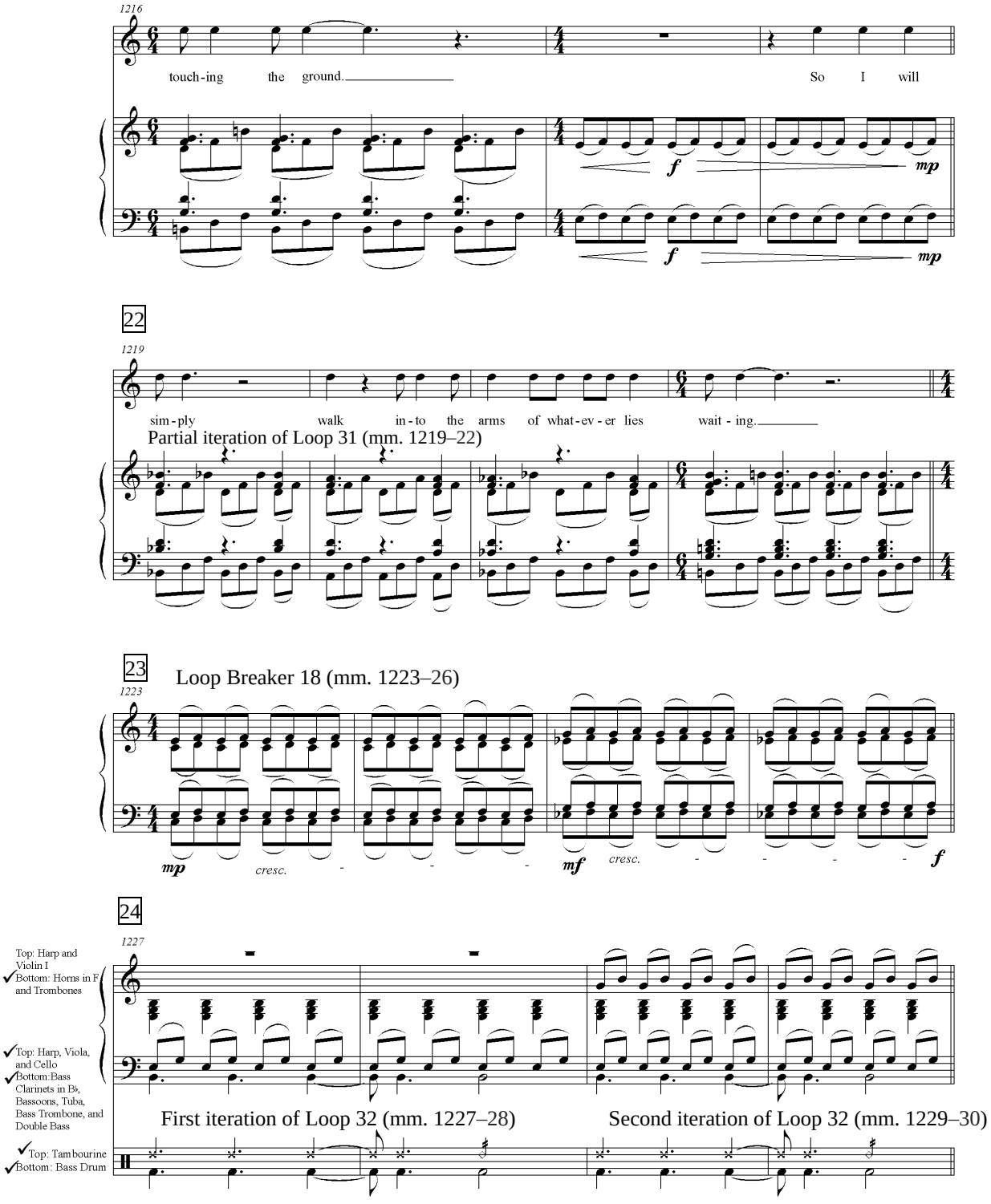
First and second iterations of Loop 30 (mm. 1169–84)

Example 52: Act I Scene 3, mm. 1206–30, rr. 19–24

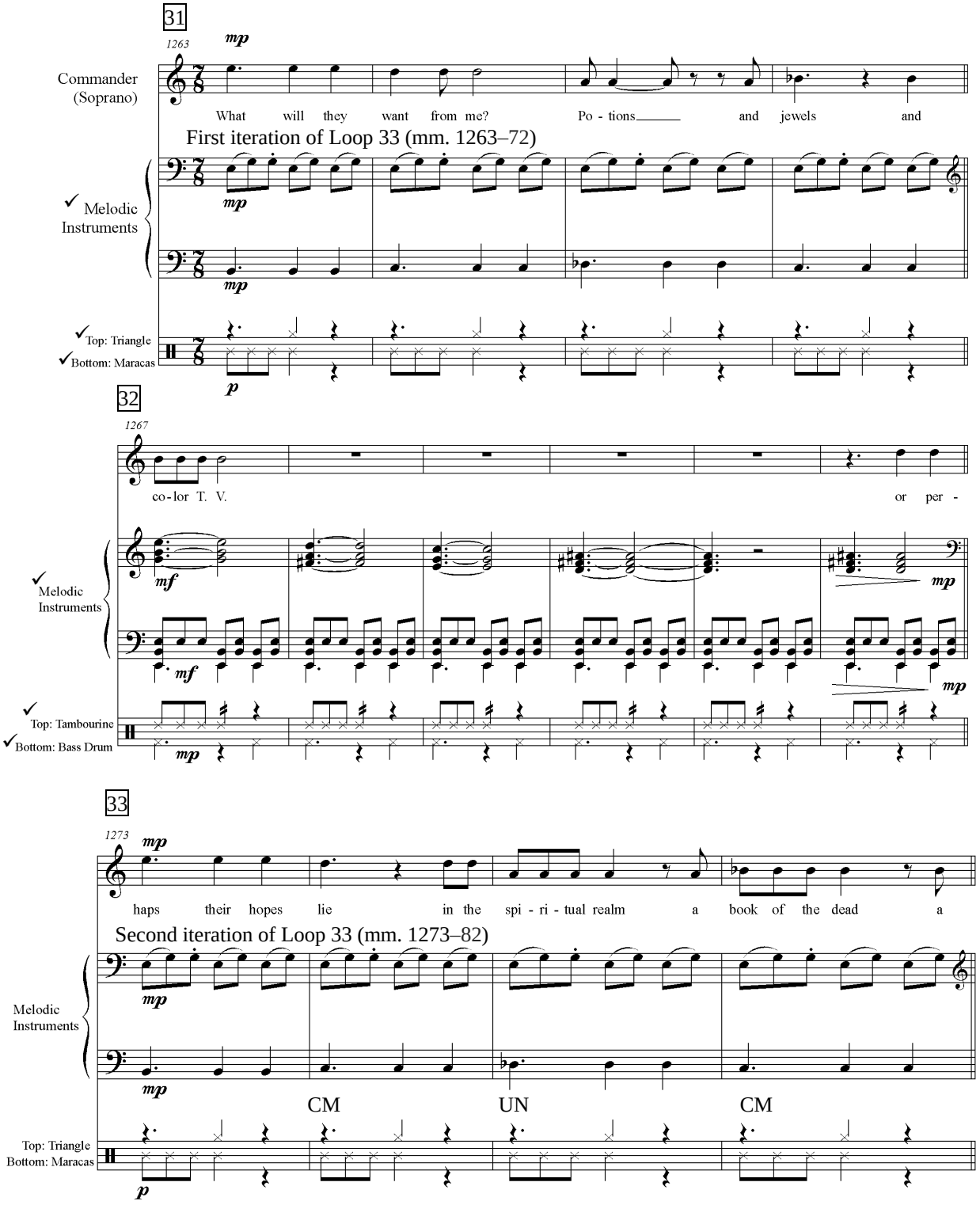


✓: Instruments forming Loop 31, Loop Breaker 18, and Loop 32

Example 52 (continued)

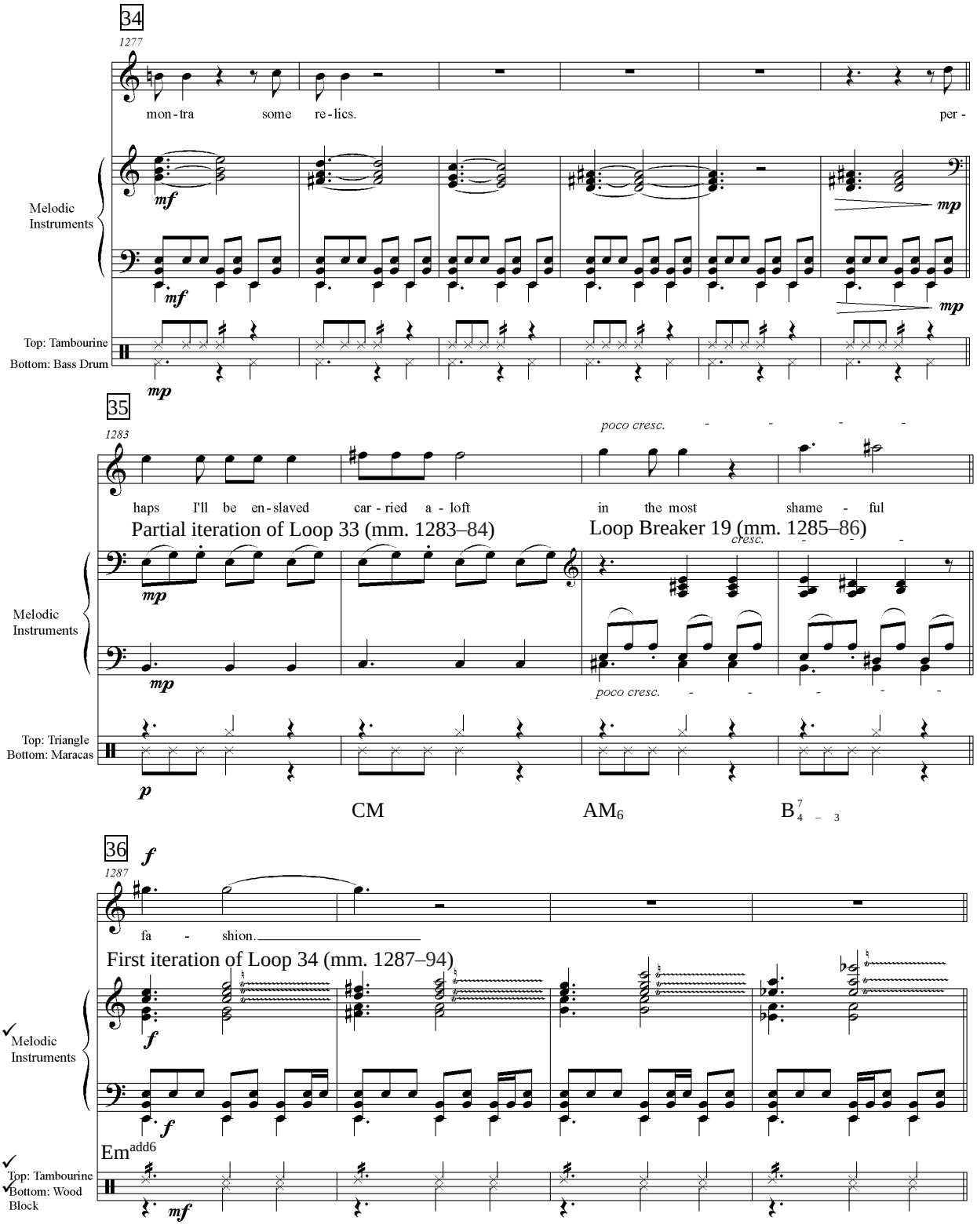


Example 53: Act I Scene 3, mm. 1263–1302, rr. 31–39

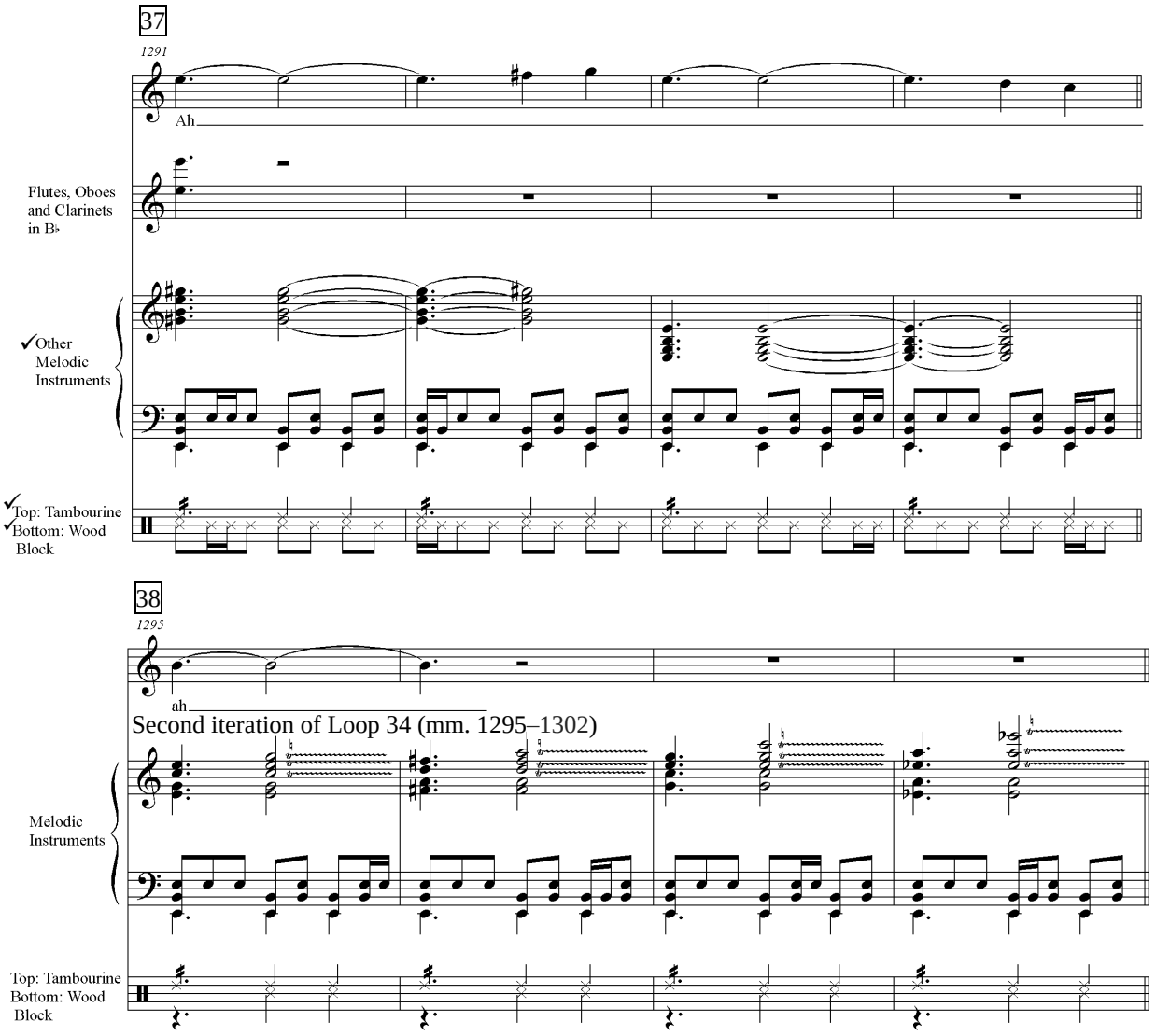


✓: Instruments forming Loop 33, Loop Breaker 19, and Loop 34

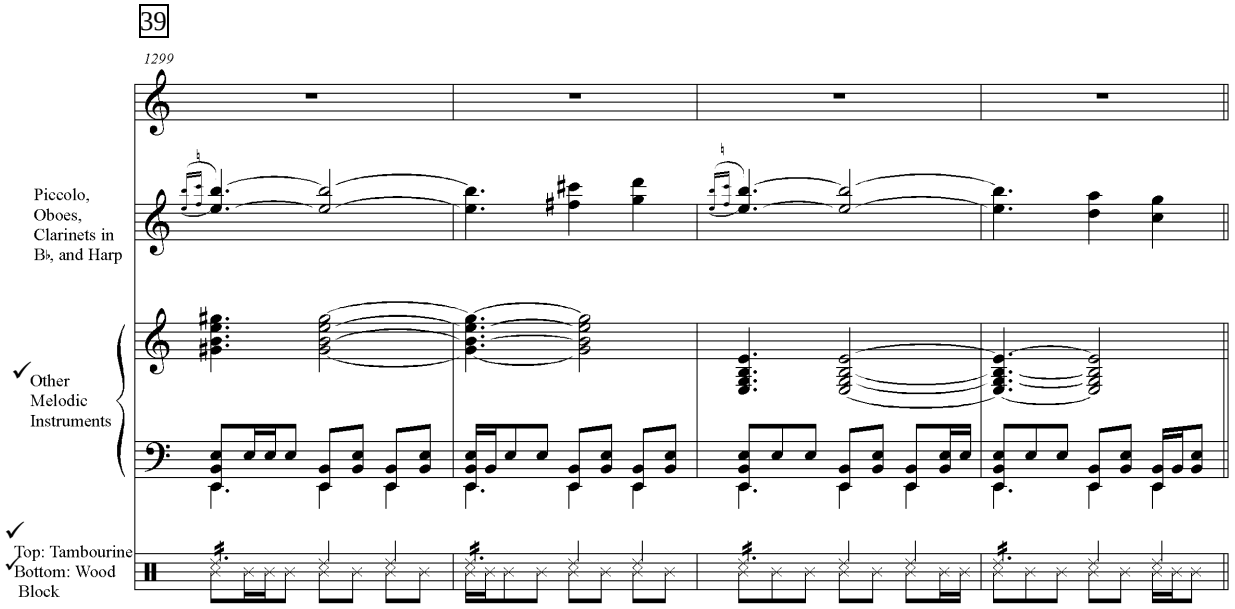
Example 53 (continued)



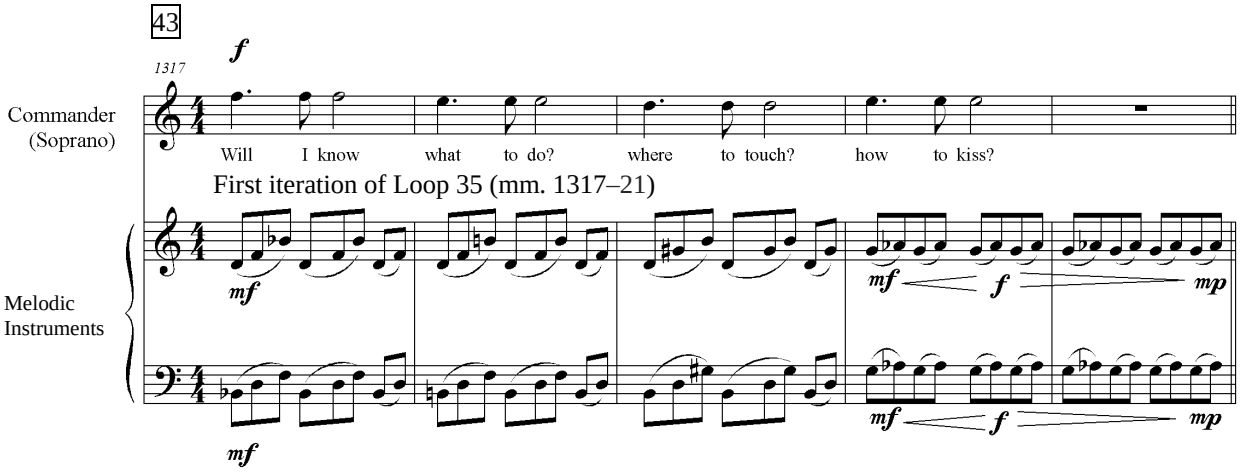
Example 53 (continued)



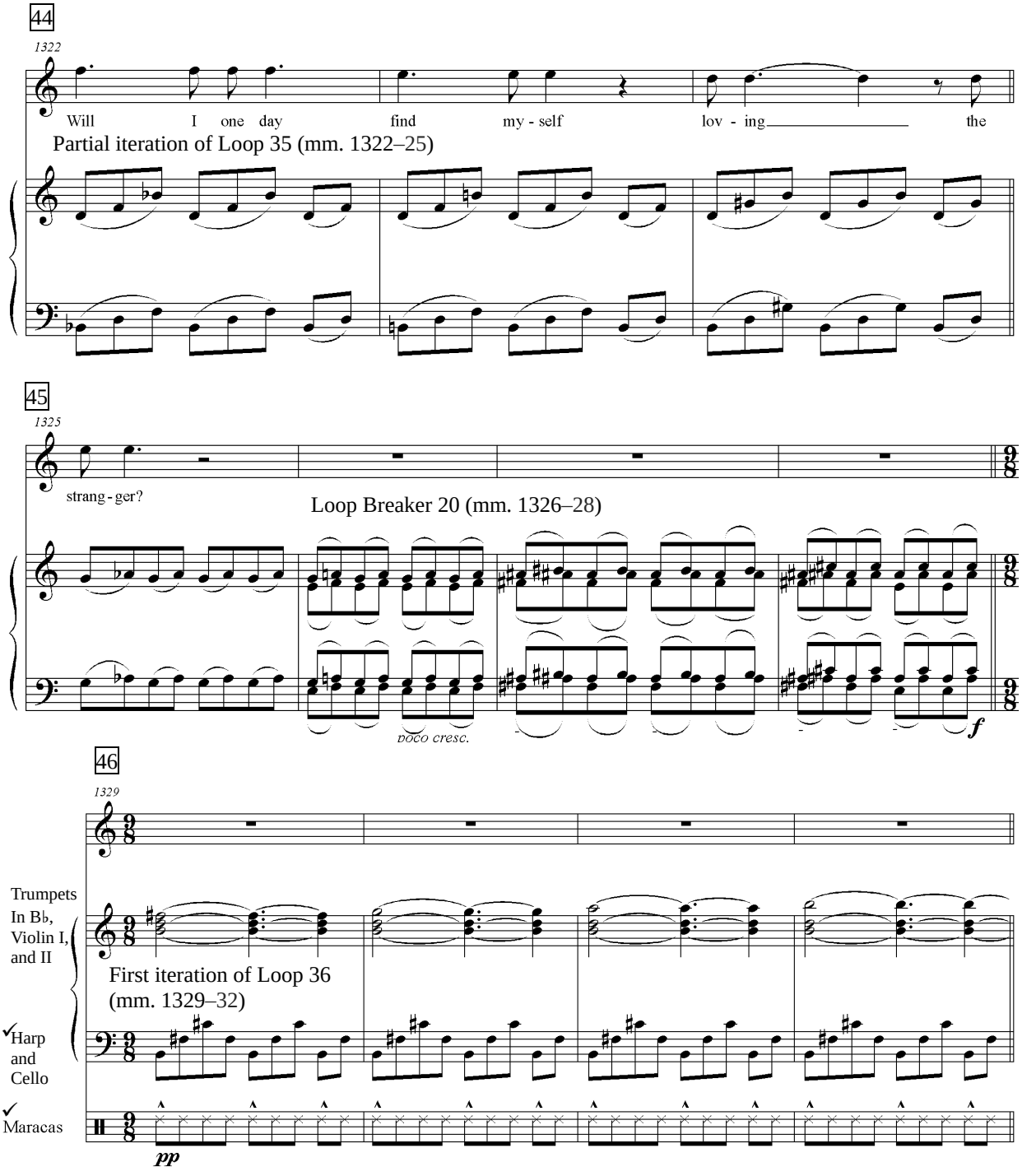
Example 53 (continued)



Example 54: Act I Scene 3, mm. 1317–36, rr. 43–47

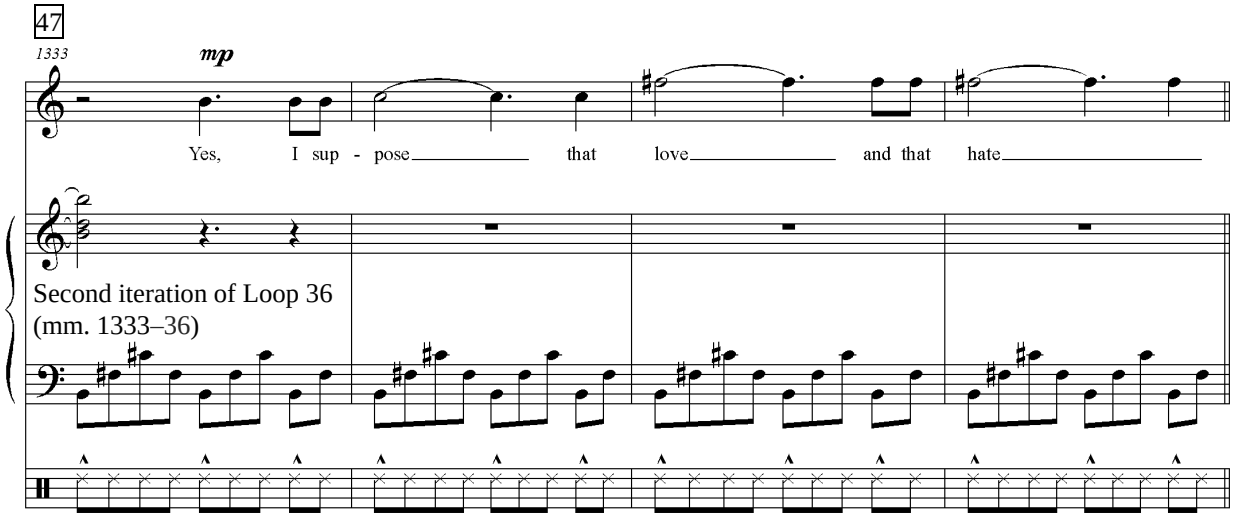


Example 54 (continued)

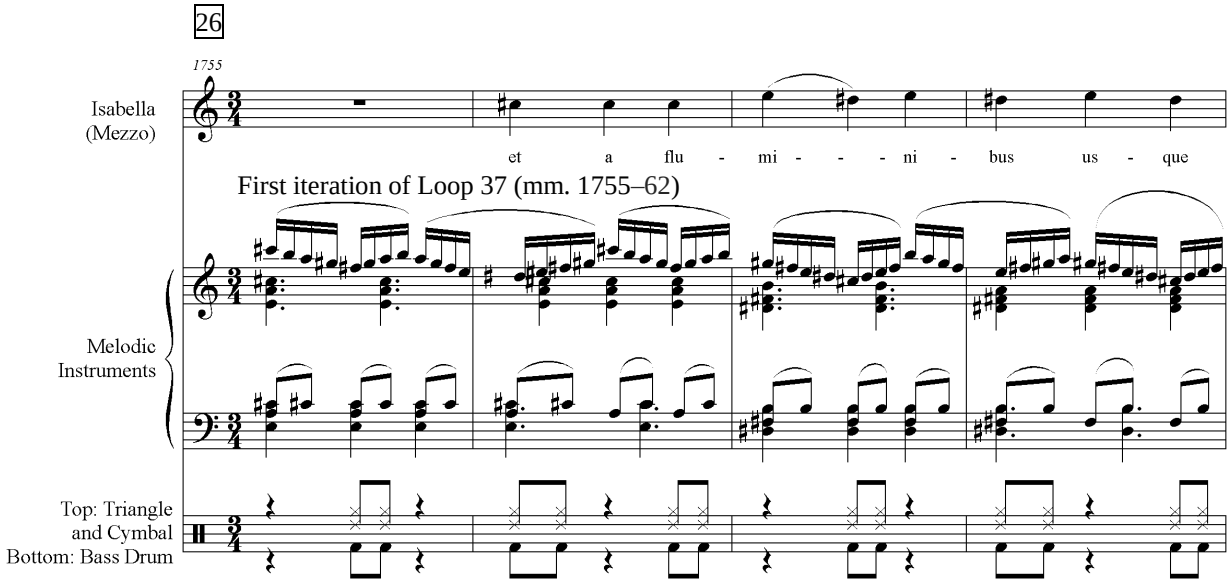


✓: Instruments forming Loop 35

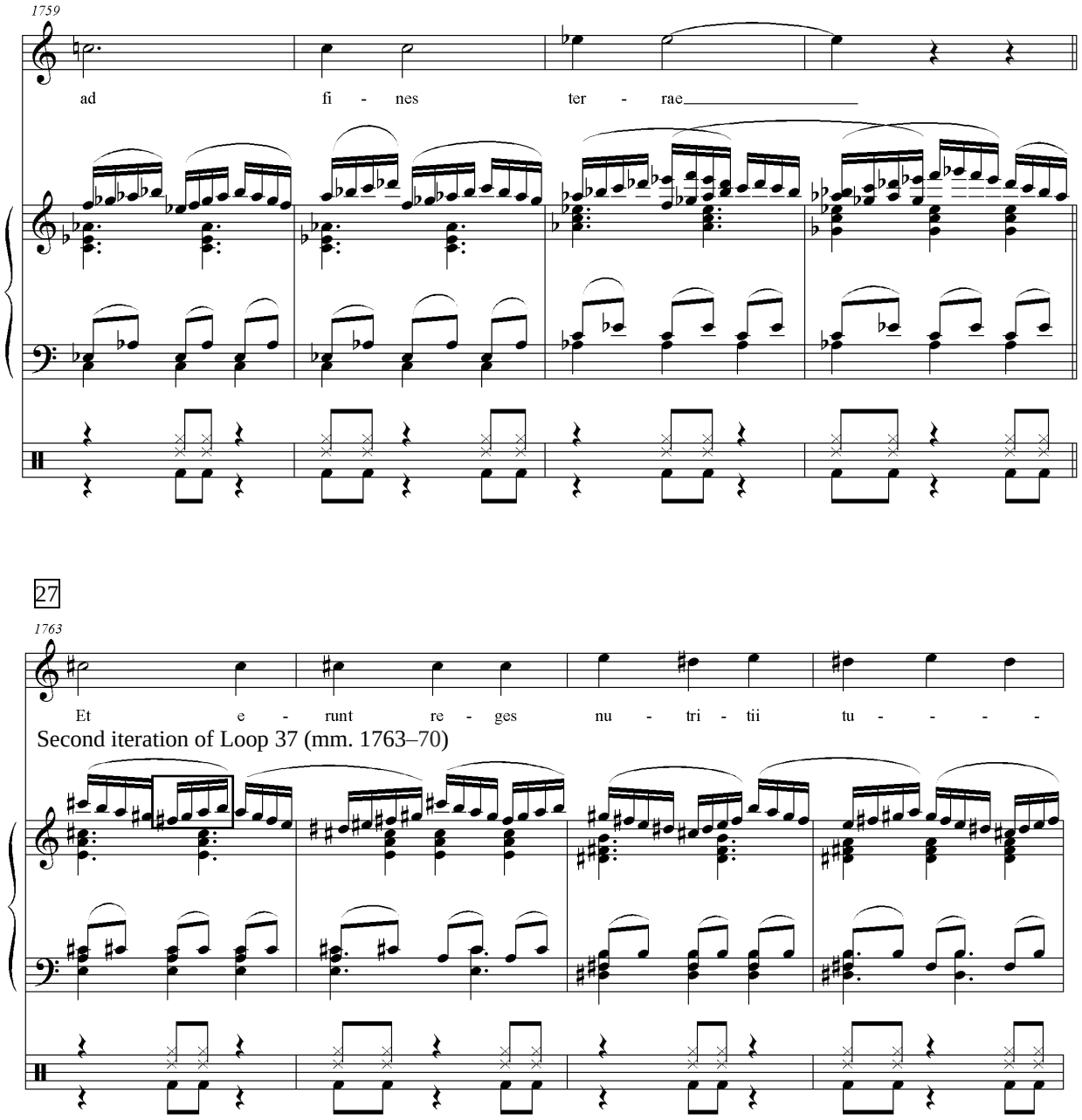
Example 54 (continued)



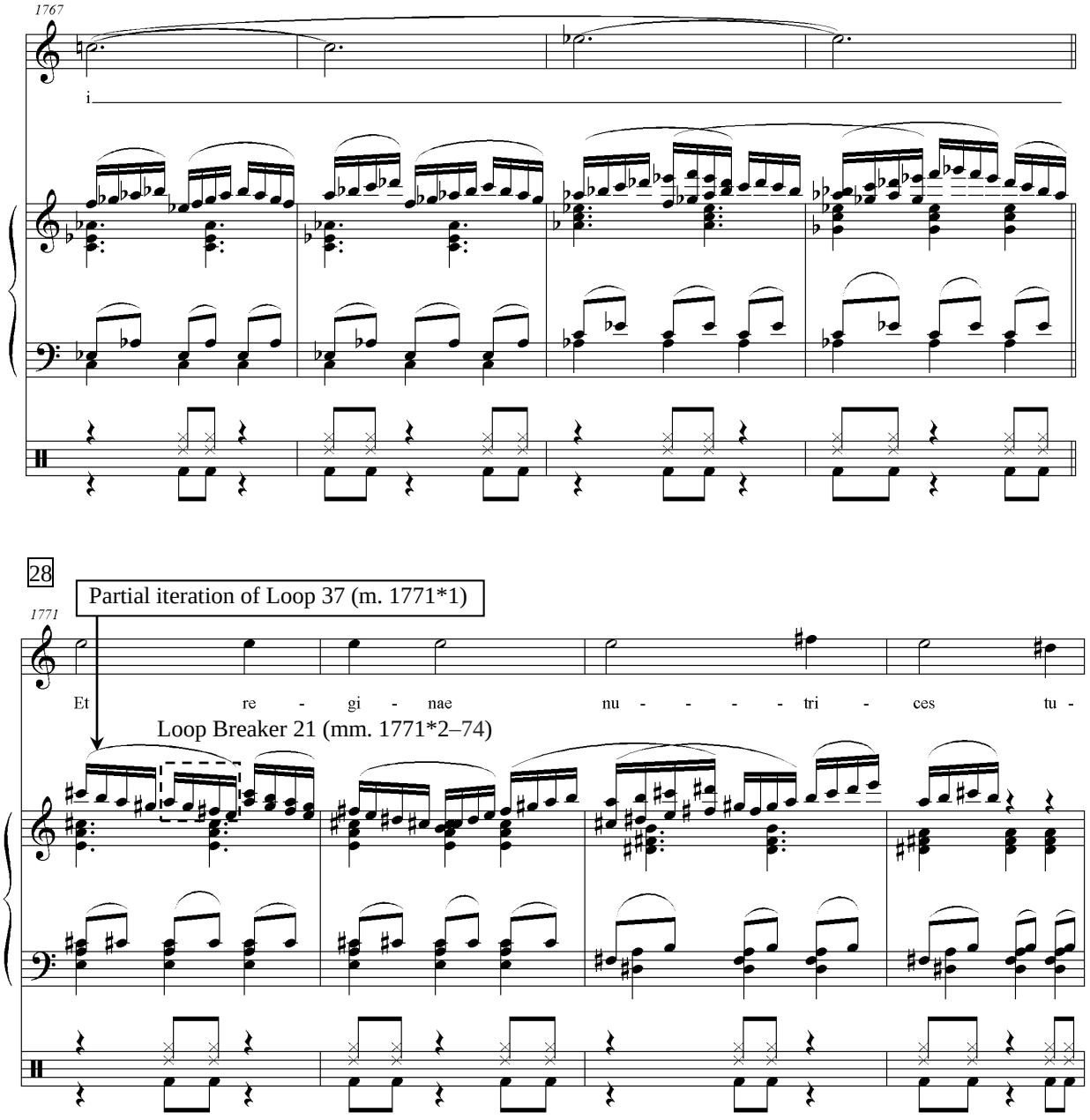
Example 55: Act II Scene 1, mm. 1755–78, rr. 26–28



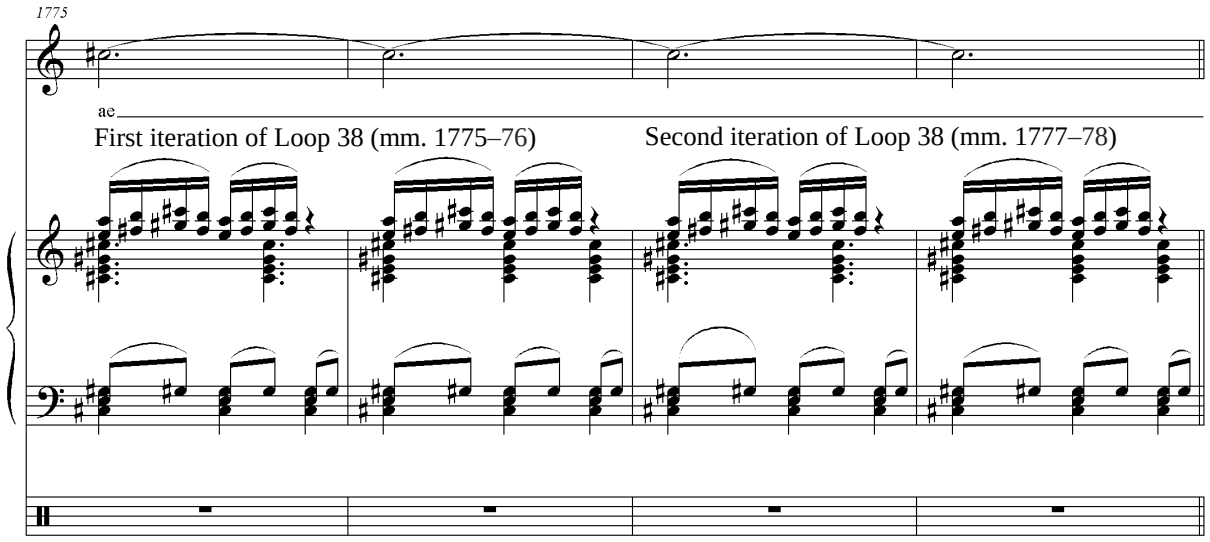
Example 55 (continued)



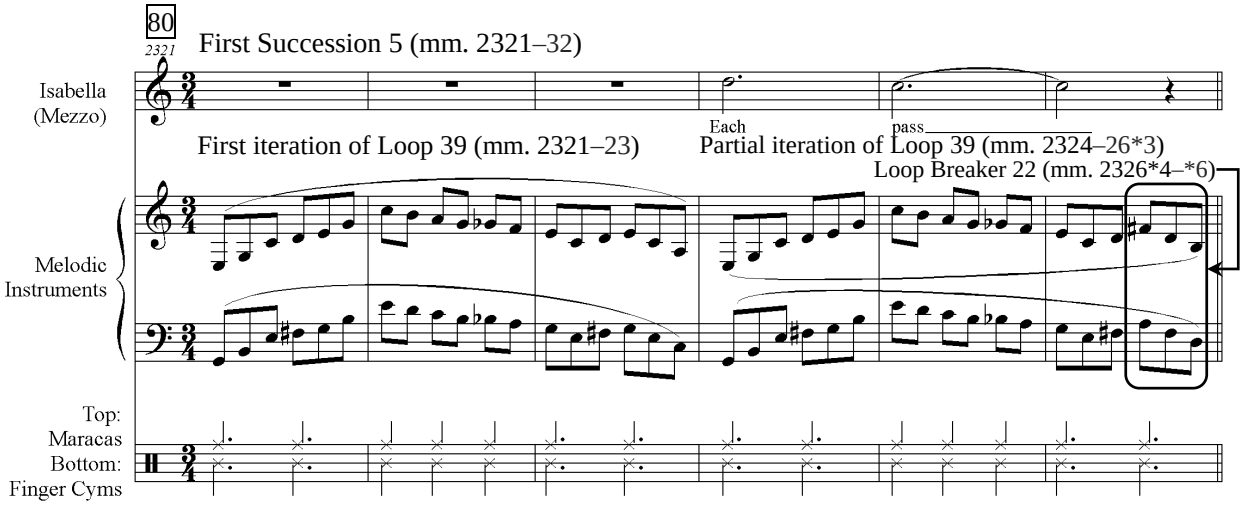
Example 55 (continued)



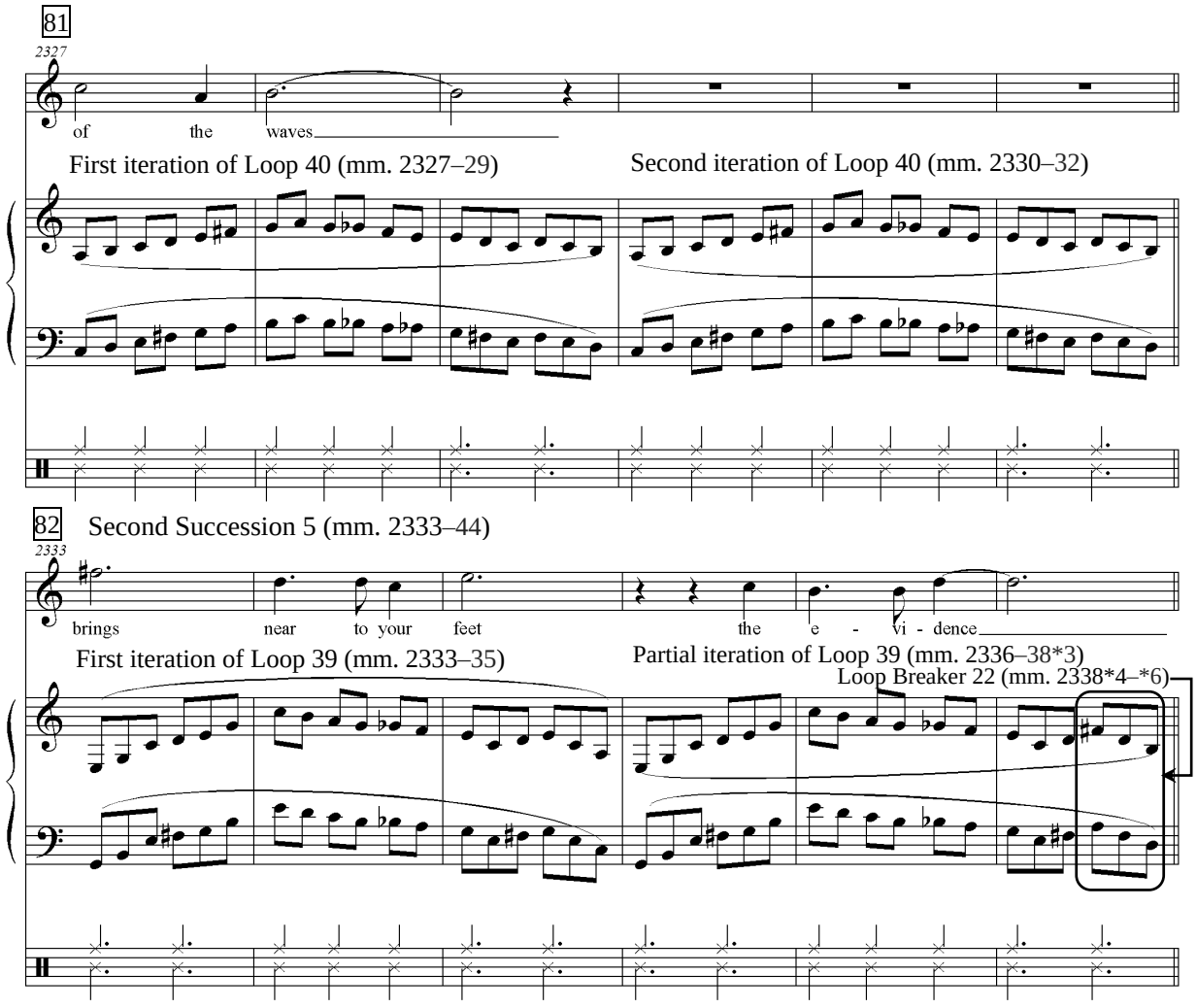
Example 55 (continued)



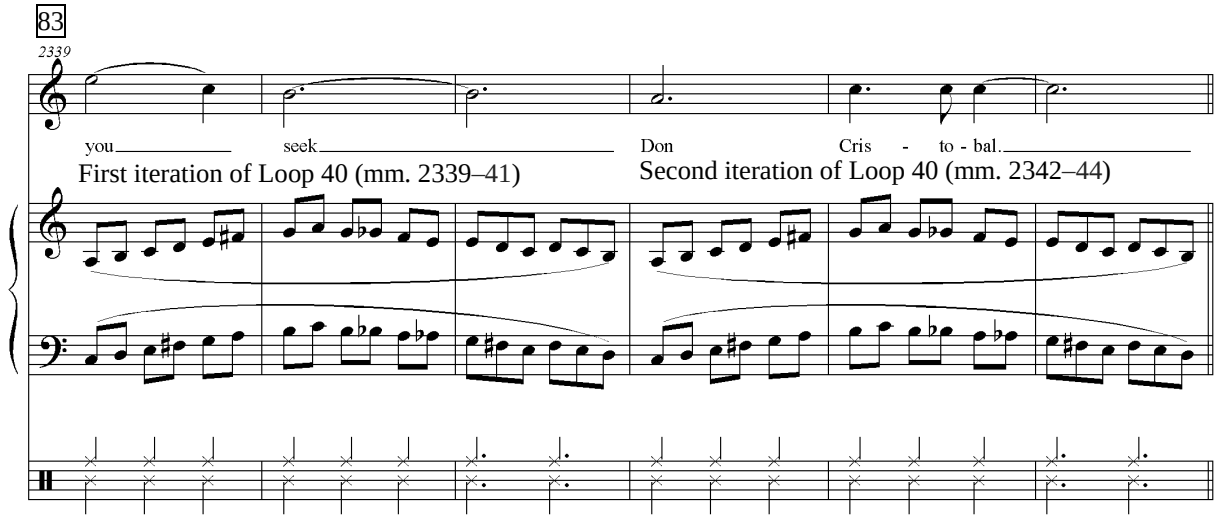
Example 56: Act II Scene 2, mm. 2321–44, rr. 80–83



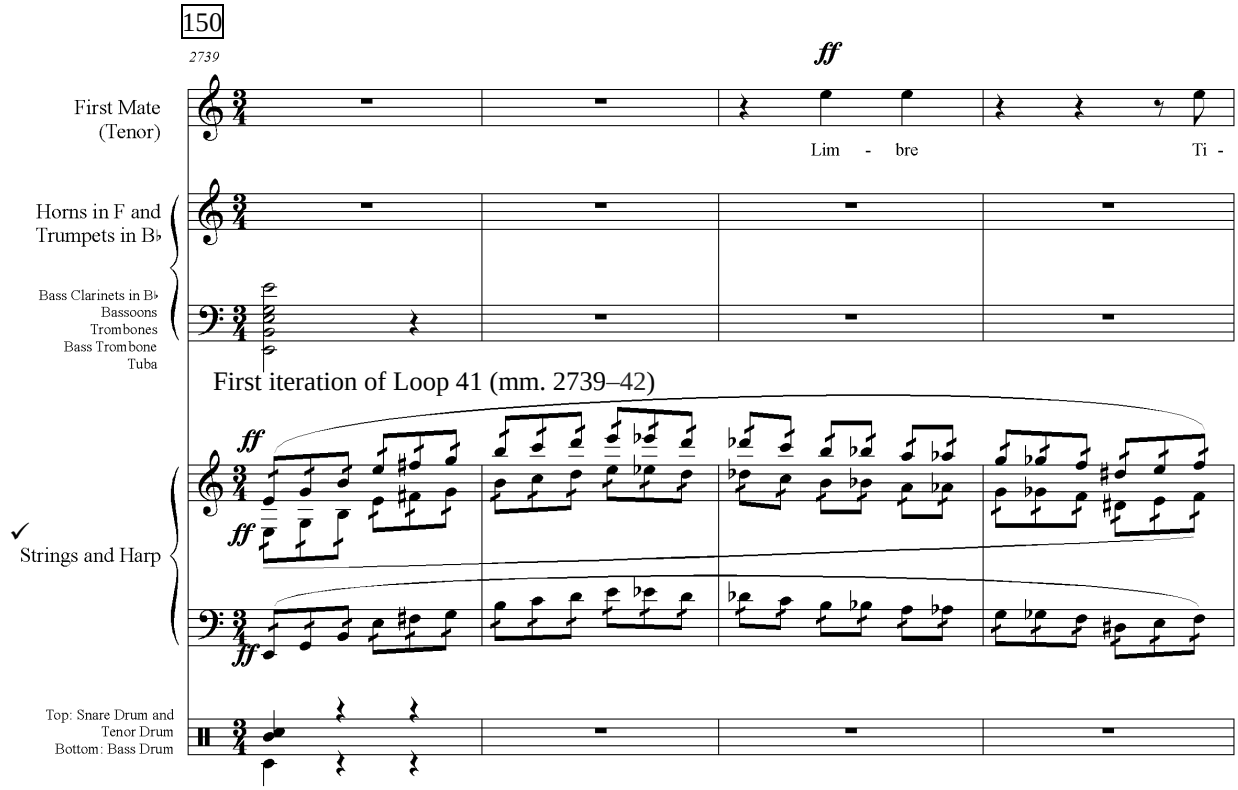
Example 56 (continued)



Example 56 (continued)

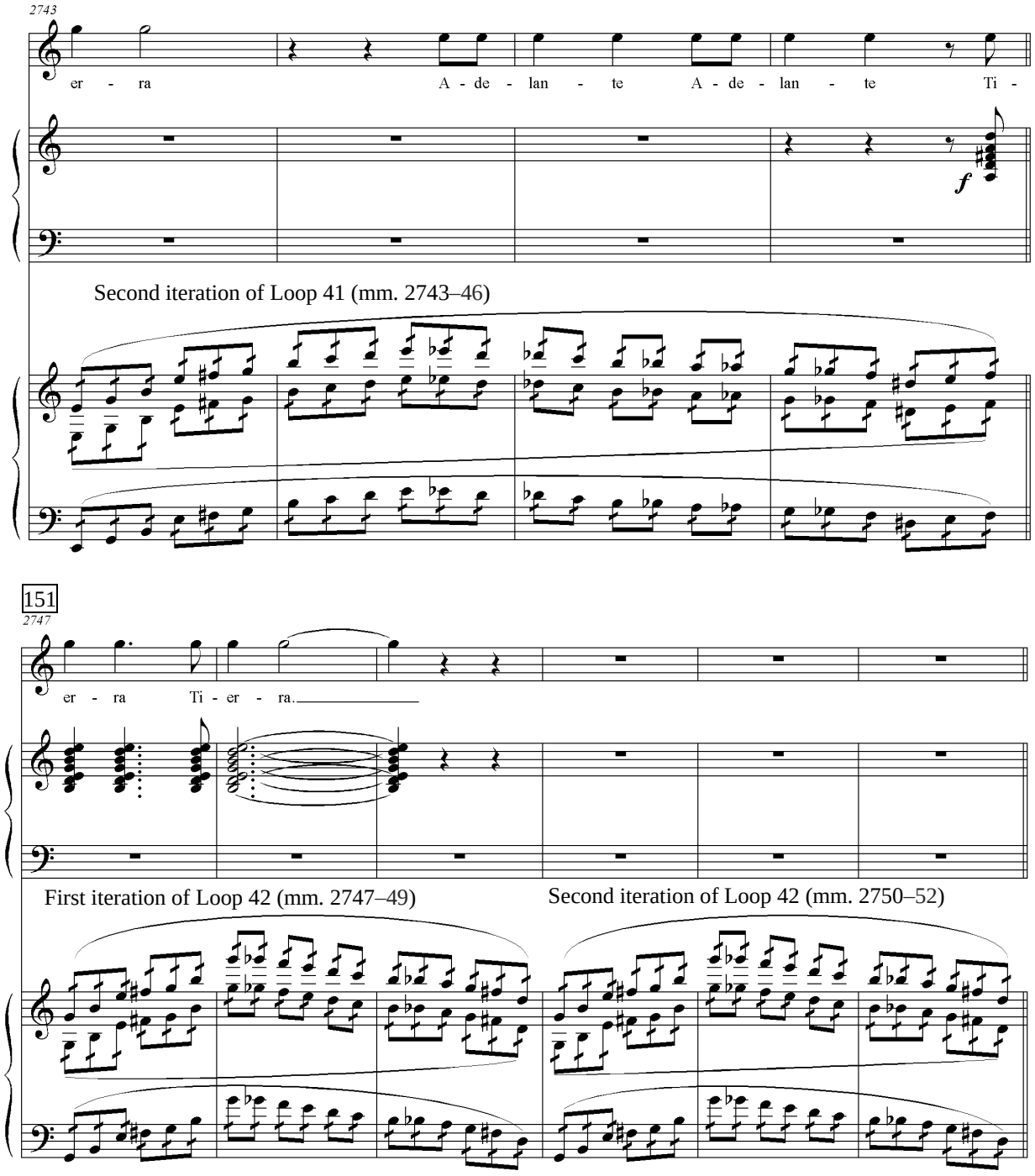


Example 57: Act II Scene 2, mm. 2739–52, rr. 150–51

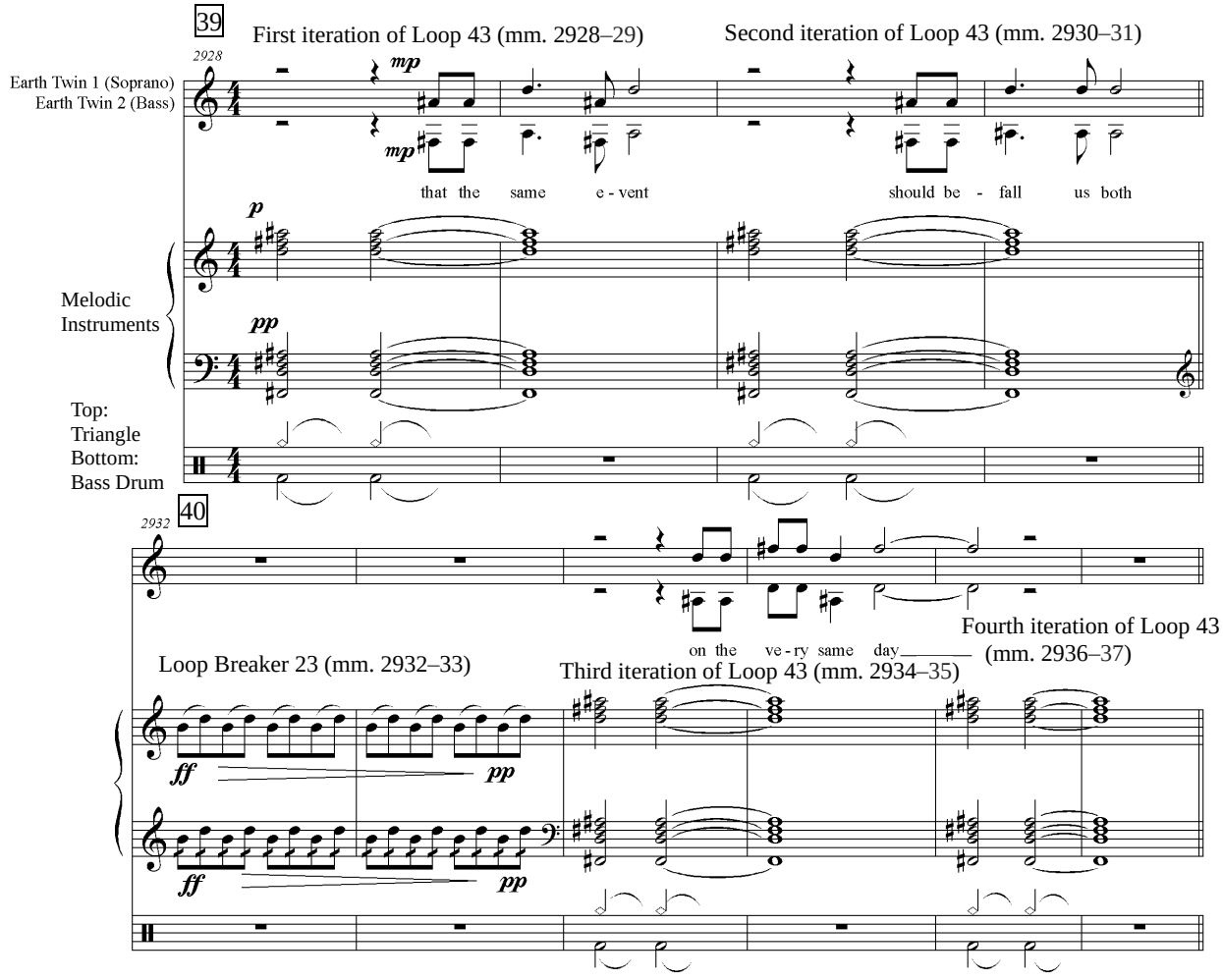


✓: Instruments forming Loops 41 and 42

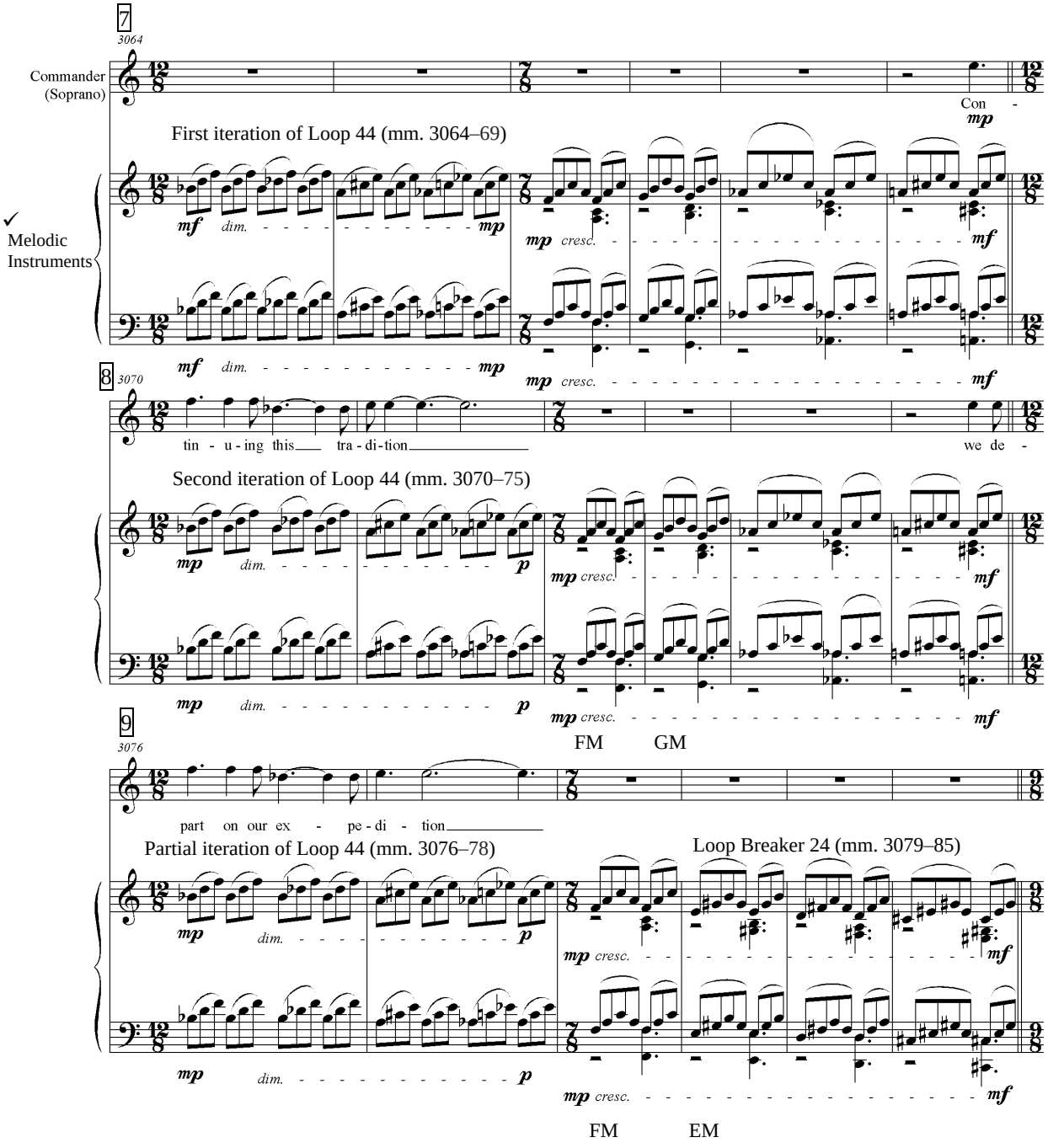
Example 57 (continued)



Example 58: Act III Scene 1, mm. 2928–37, rr. 39–40

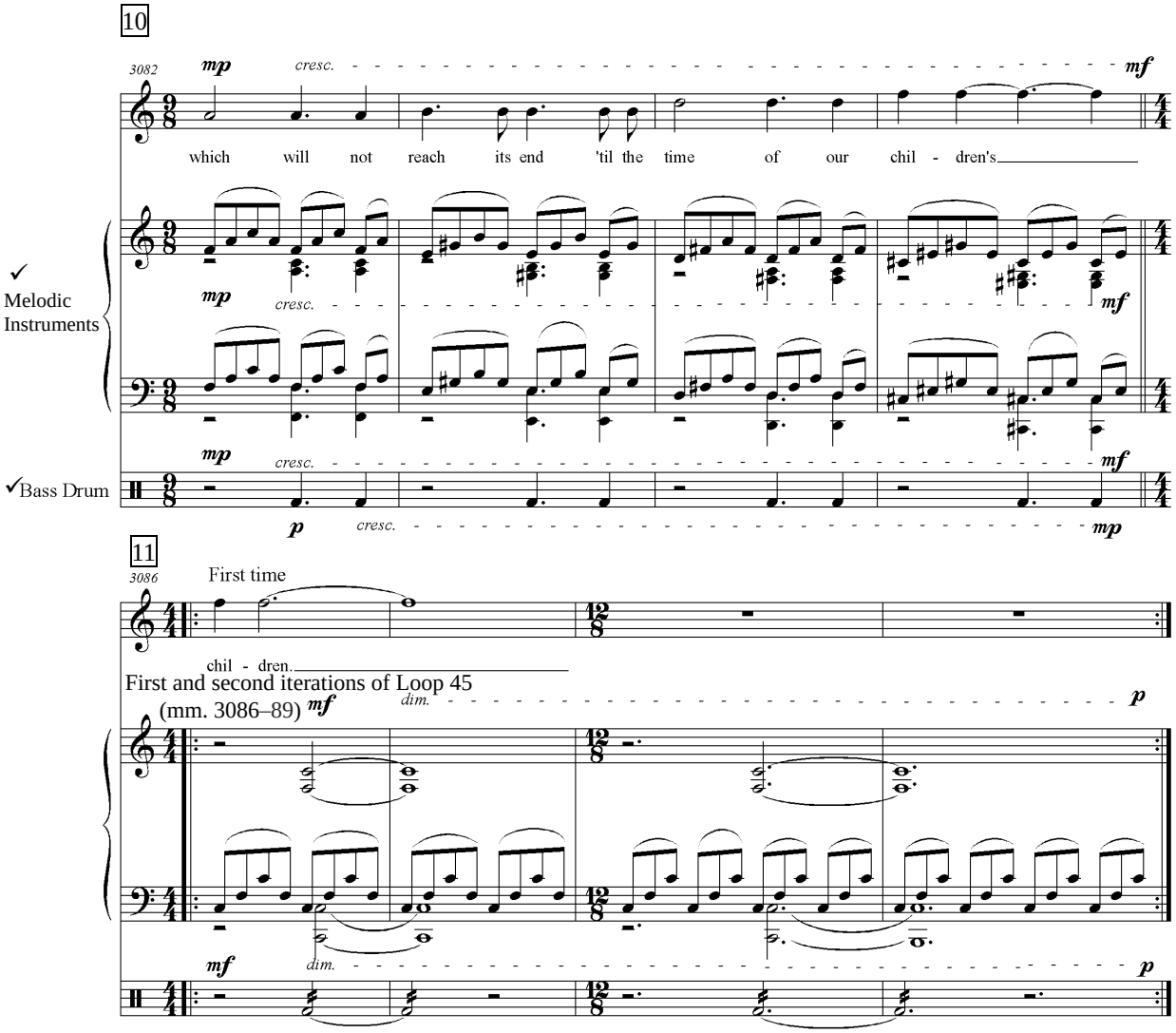


Example 59: Act III Scene 2, mm. 3064–89, rr. 7–11

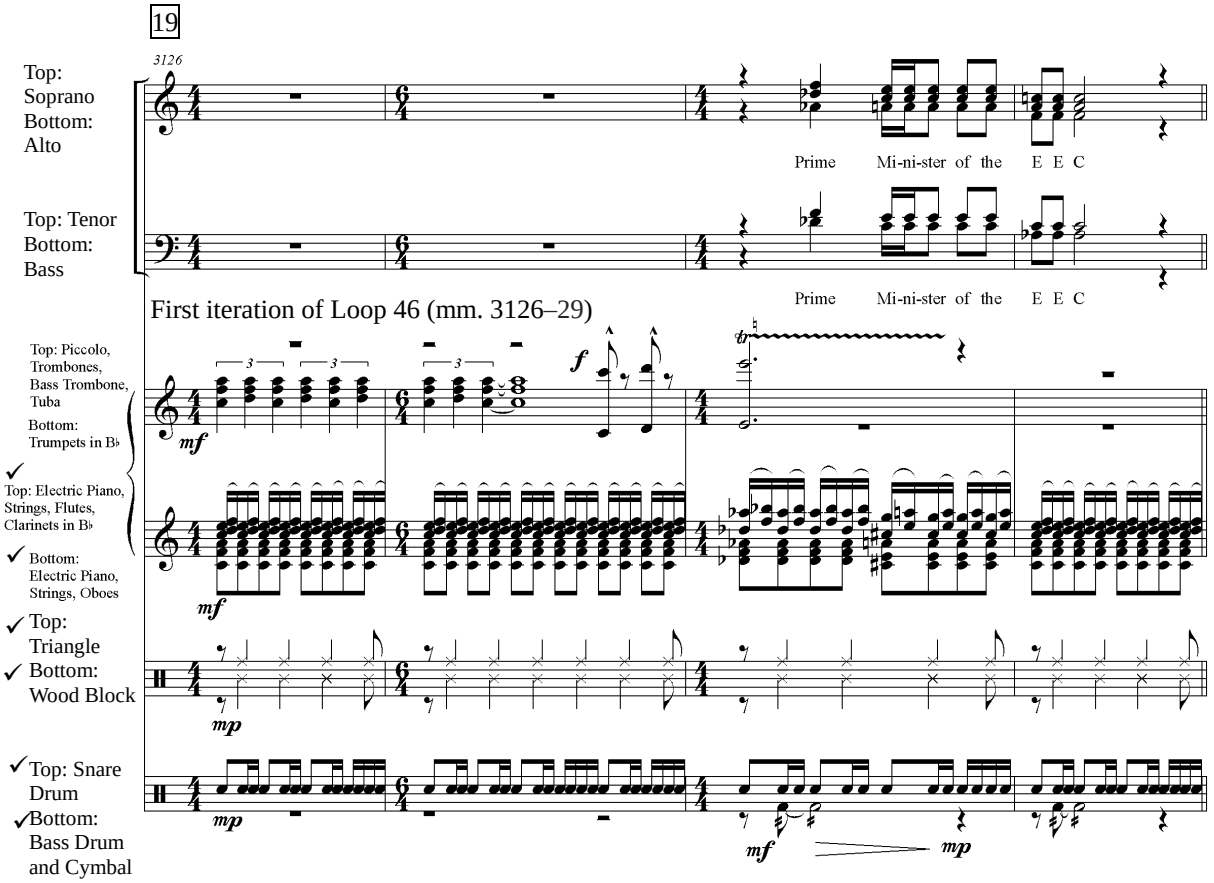


✓: Instruments forming Loop 44, Loop Breaker 24, and Loop 45

Example 59 (continued)

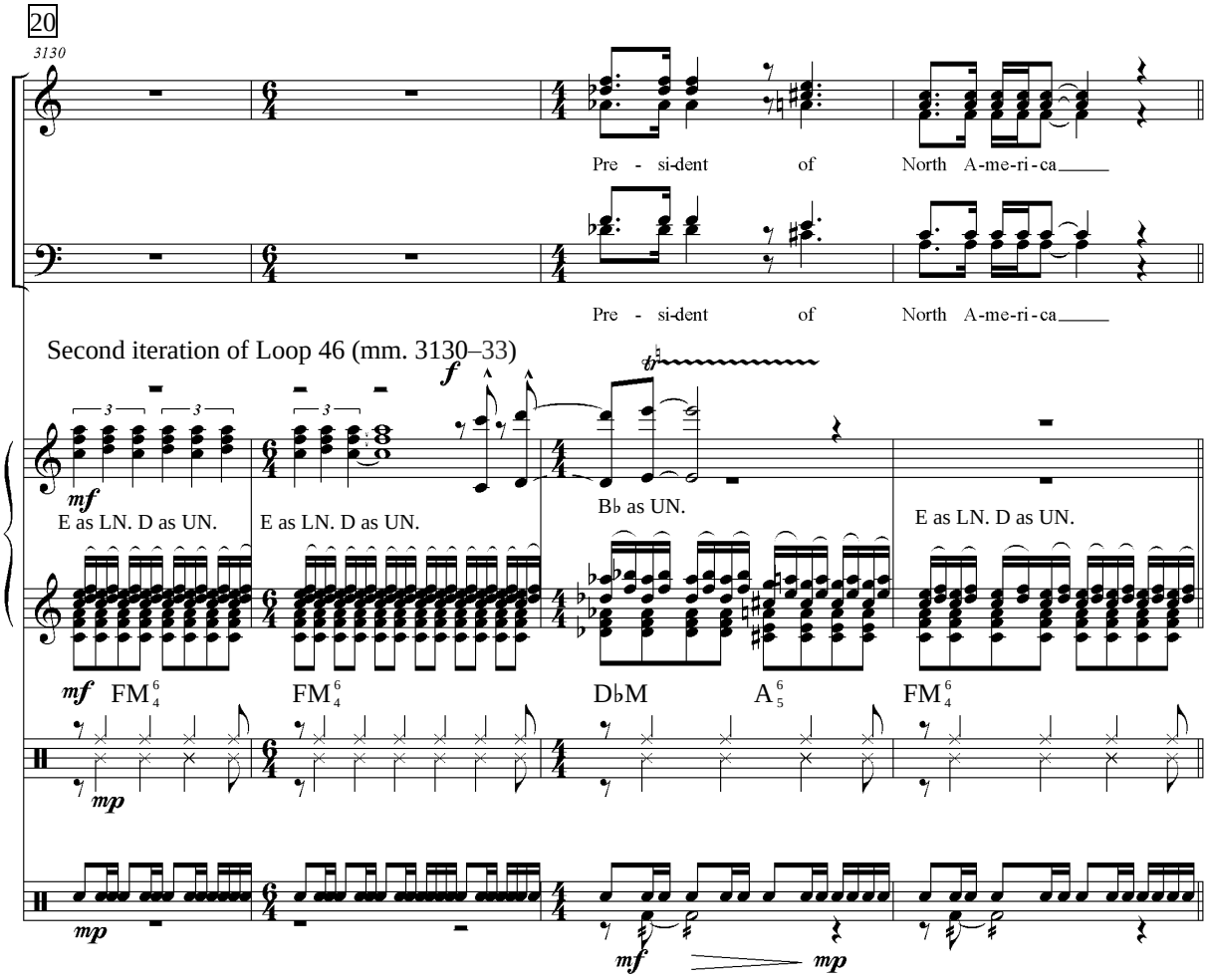


Example 60: Act III Scene 2, mm. 3126–39, rr. 19–21

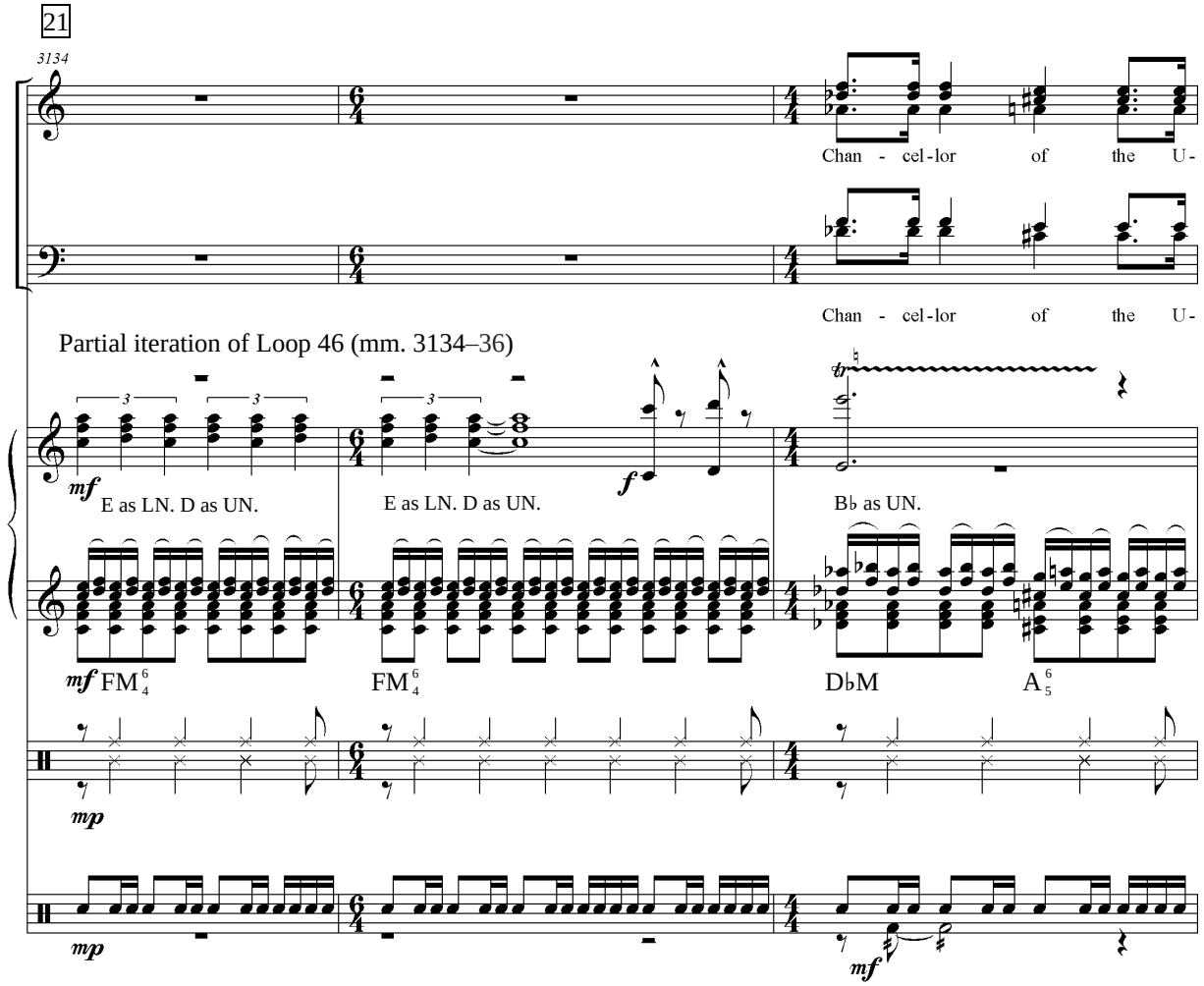


✓: Instruments forming Loop 46, Loop Breaker 25, and Loop 47

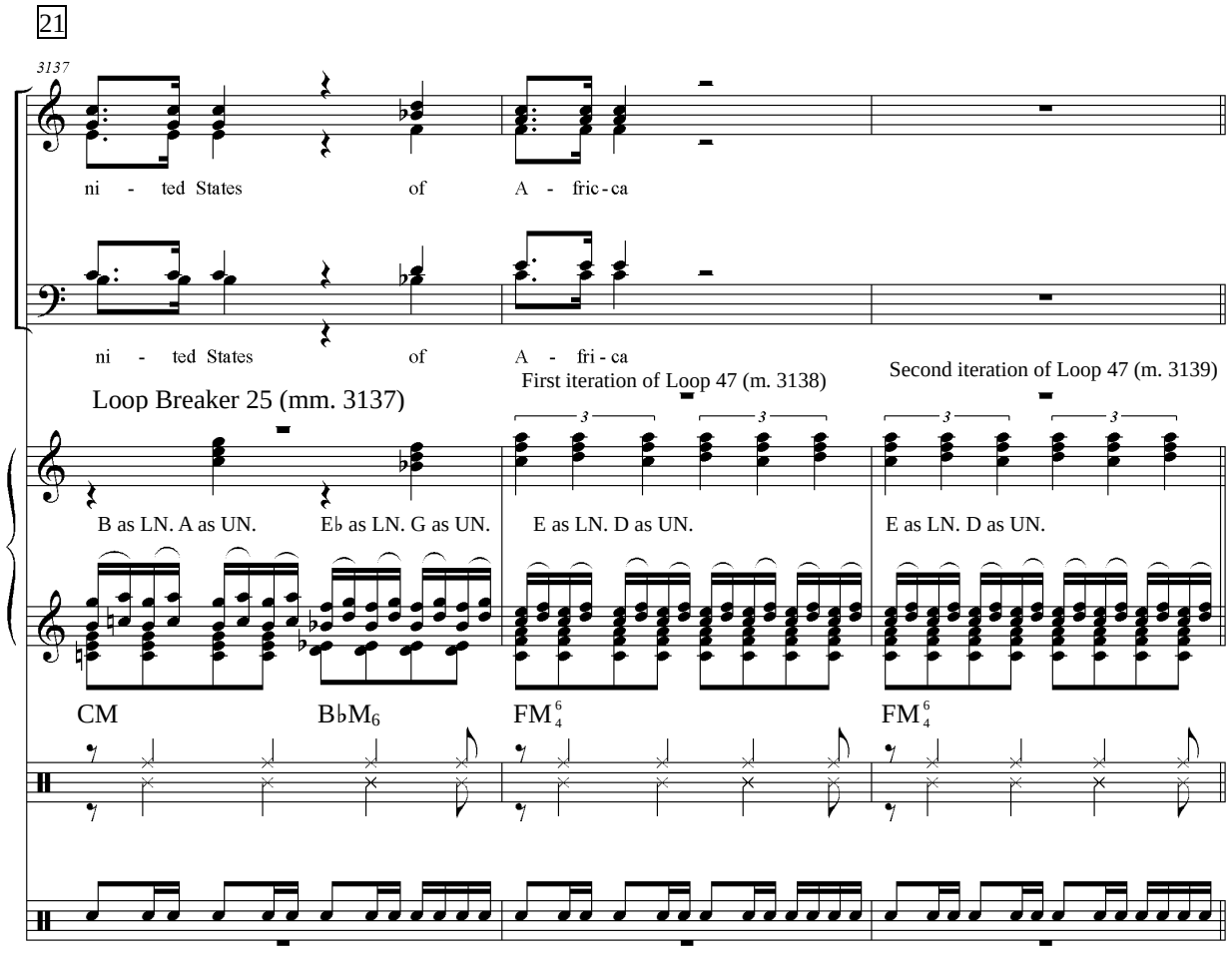
Example 60 (continued)



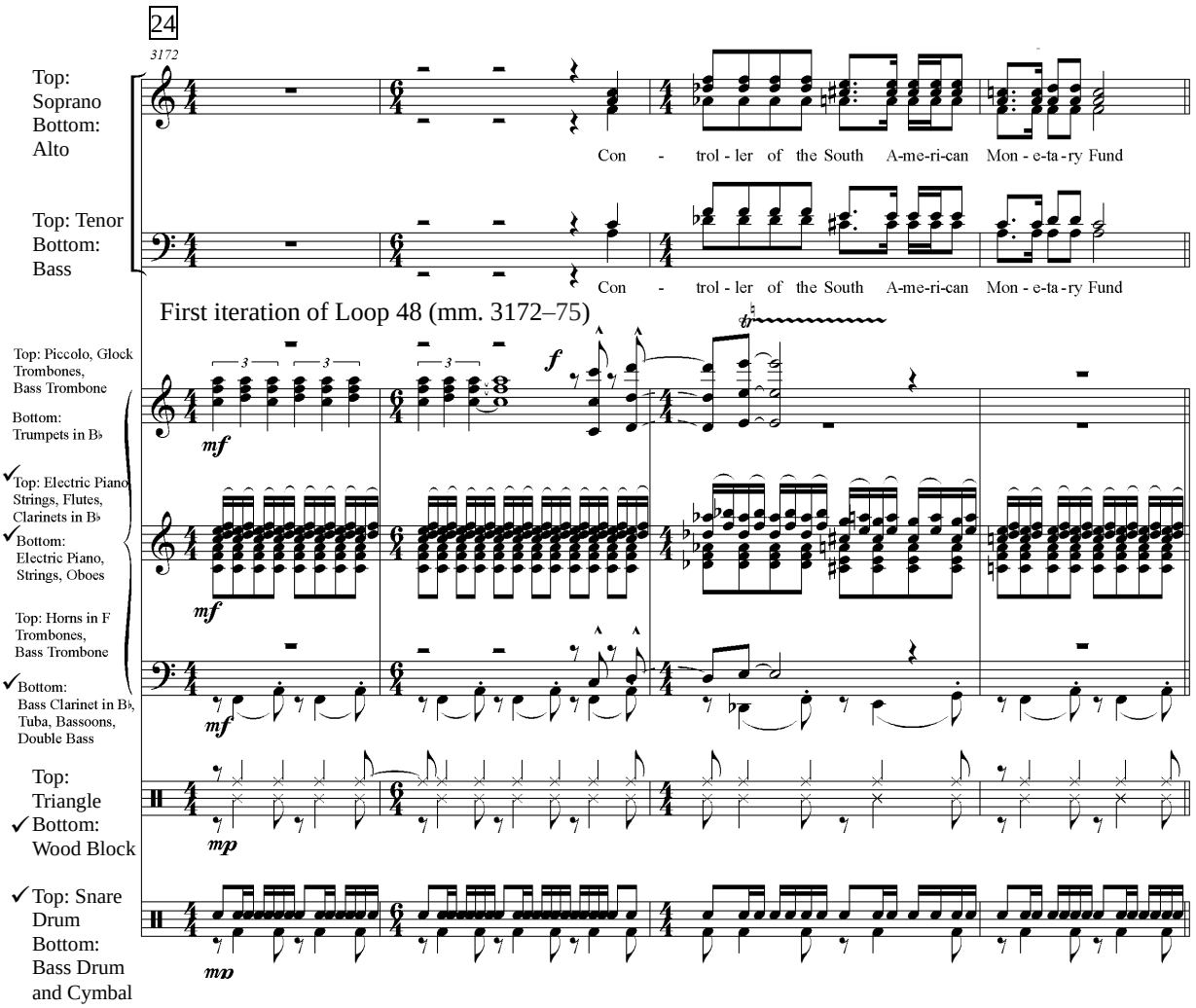
Example 60 (continued)



Example 60 (continued)

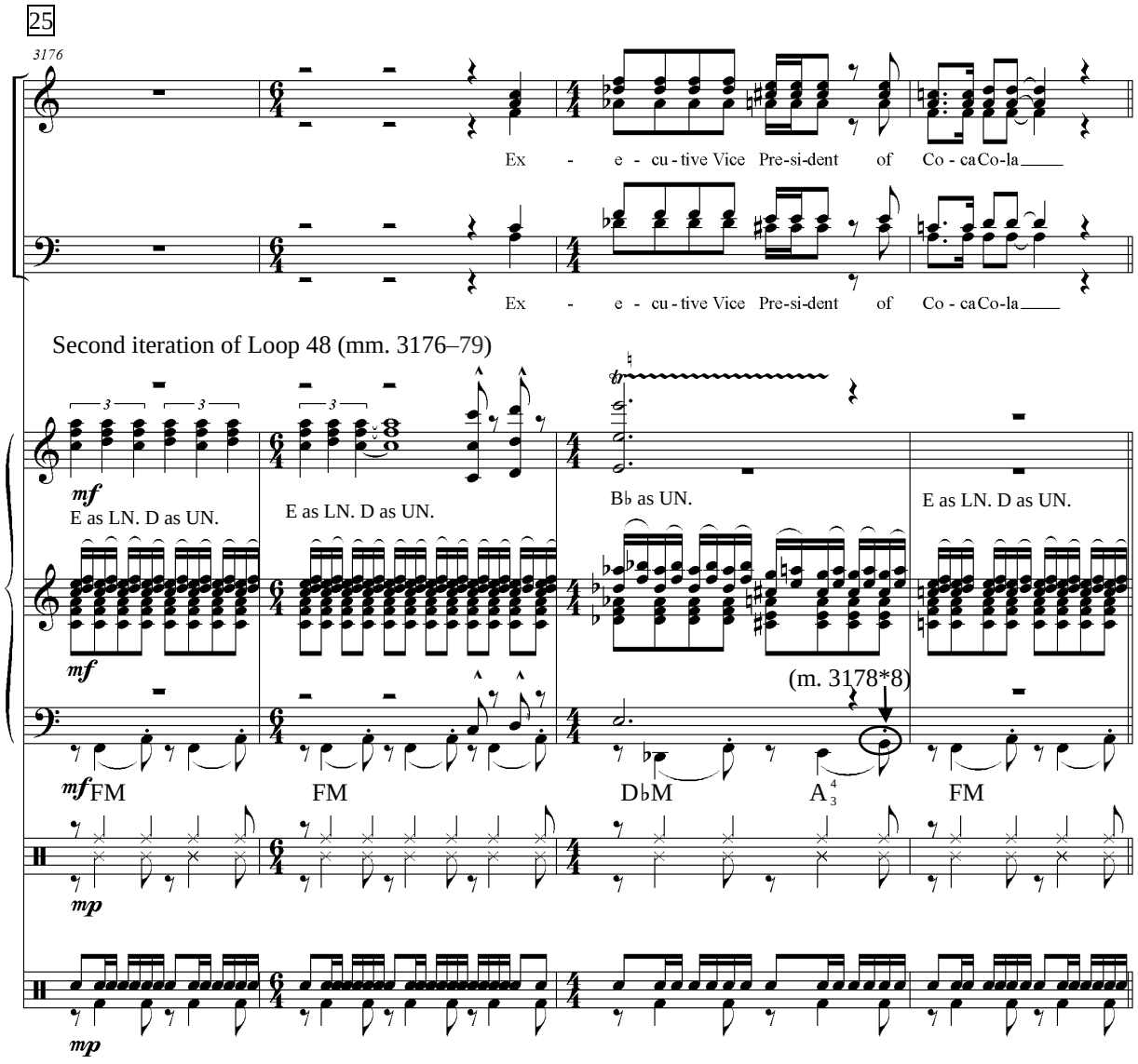


Example 61: Act III Scene 2, mm. 3172–85, rr. 24–26

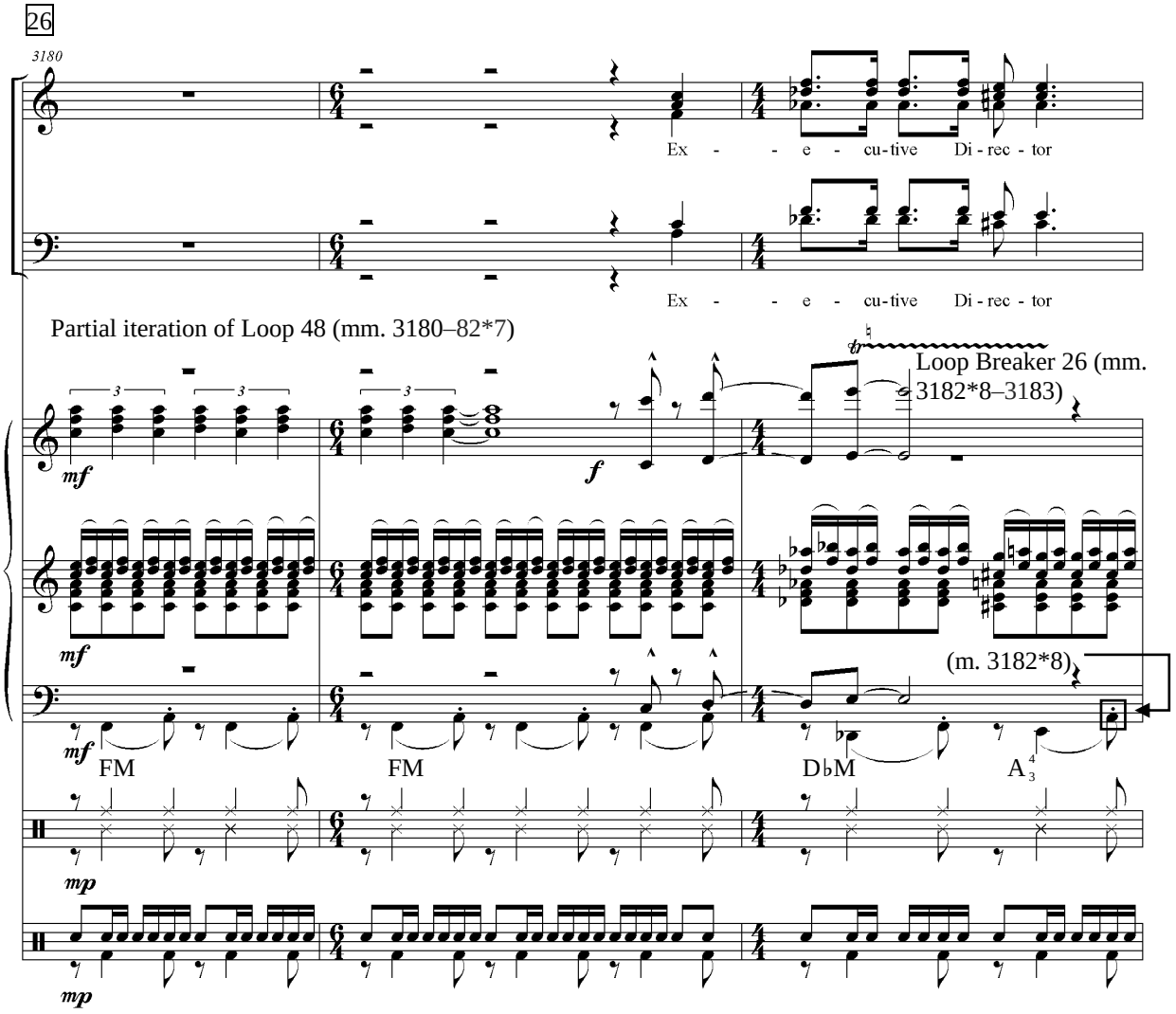


✓: Instruments forming Loop 48 and Loop Breaker 26

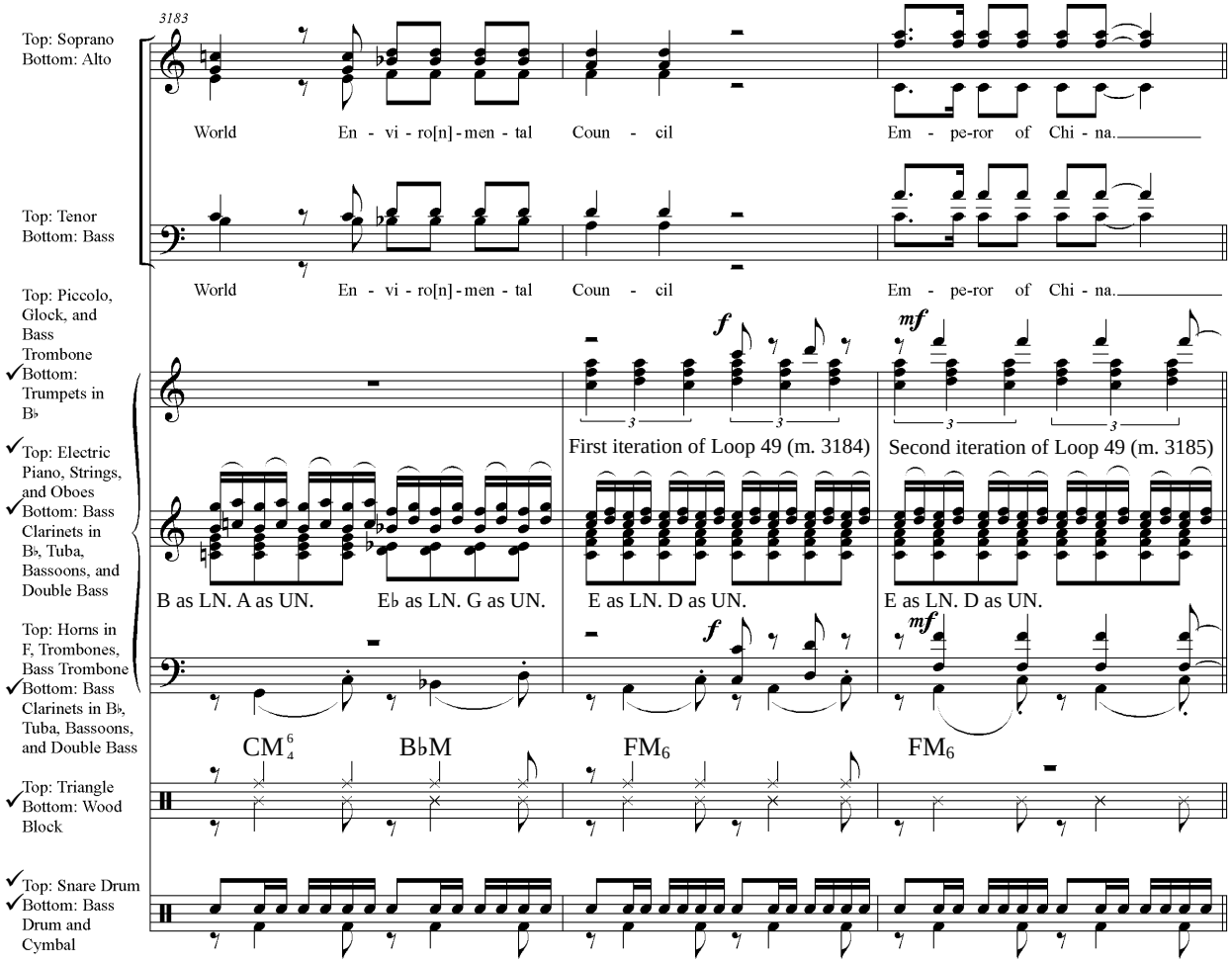
Example 61 (continued)



Example 61 (continued)

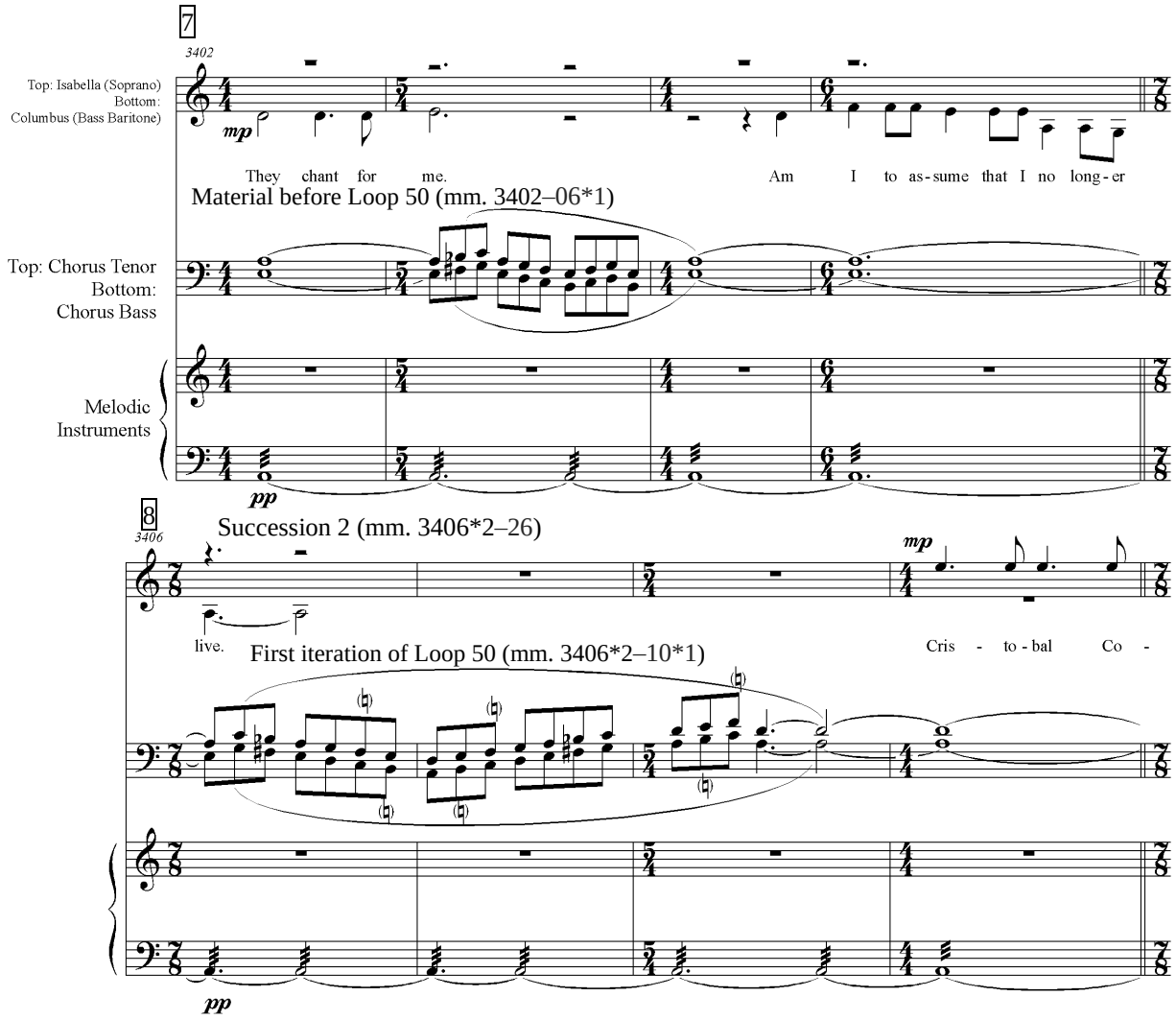


Example 61 (continued)

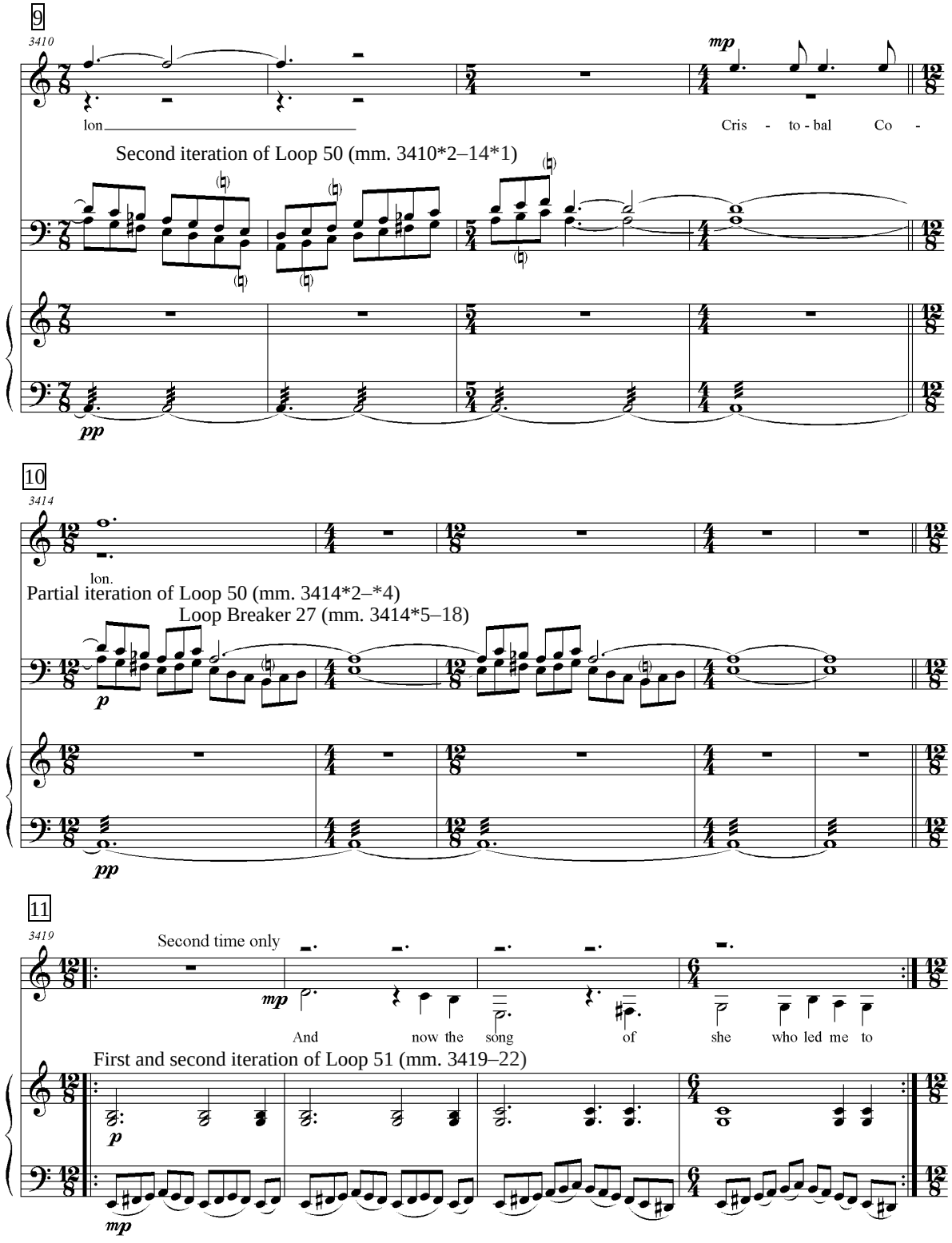


✓: Instruments forming Loop 49

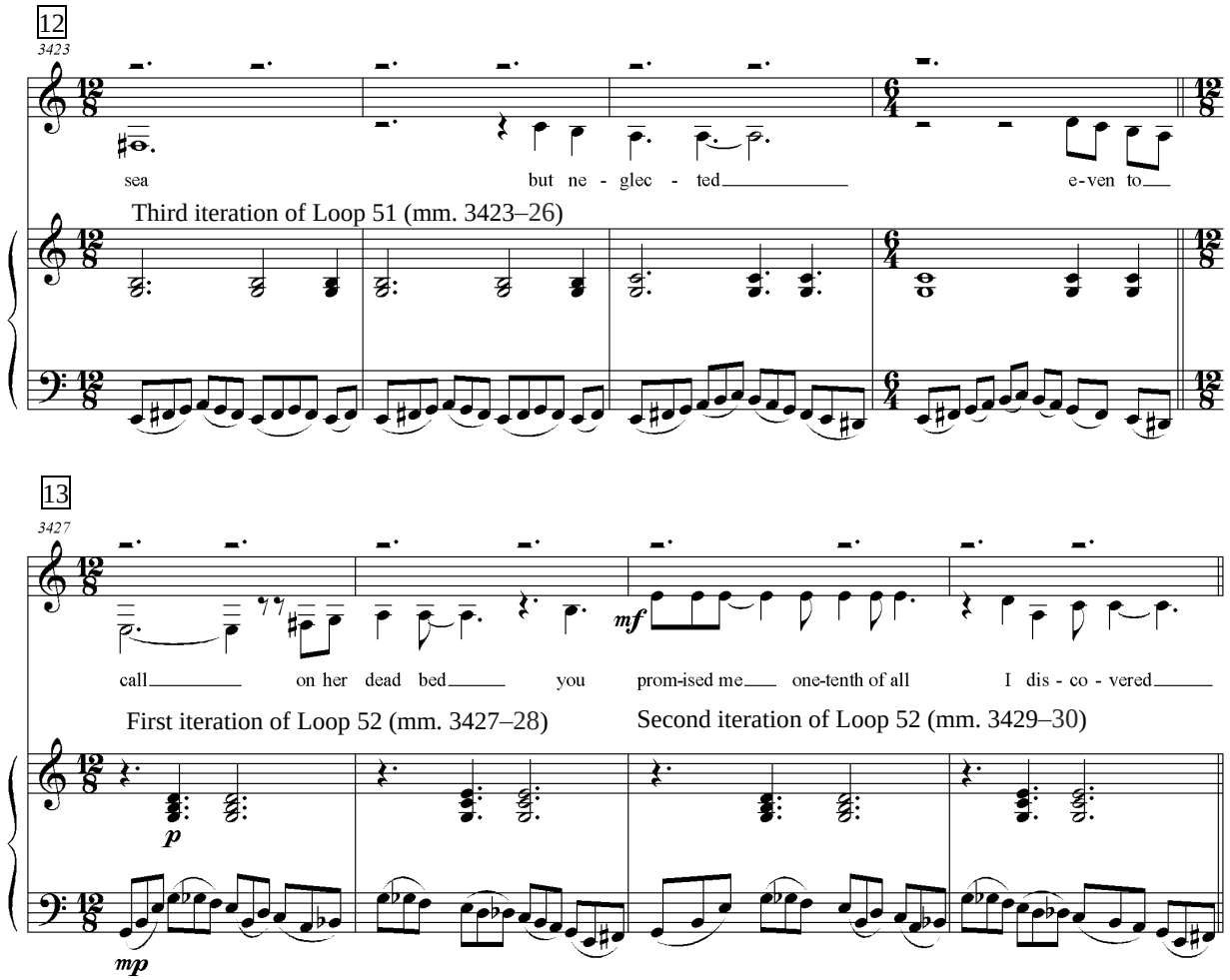
Example 62: Act III Epilogue, mm. 3402–30, rr. 7–13



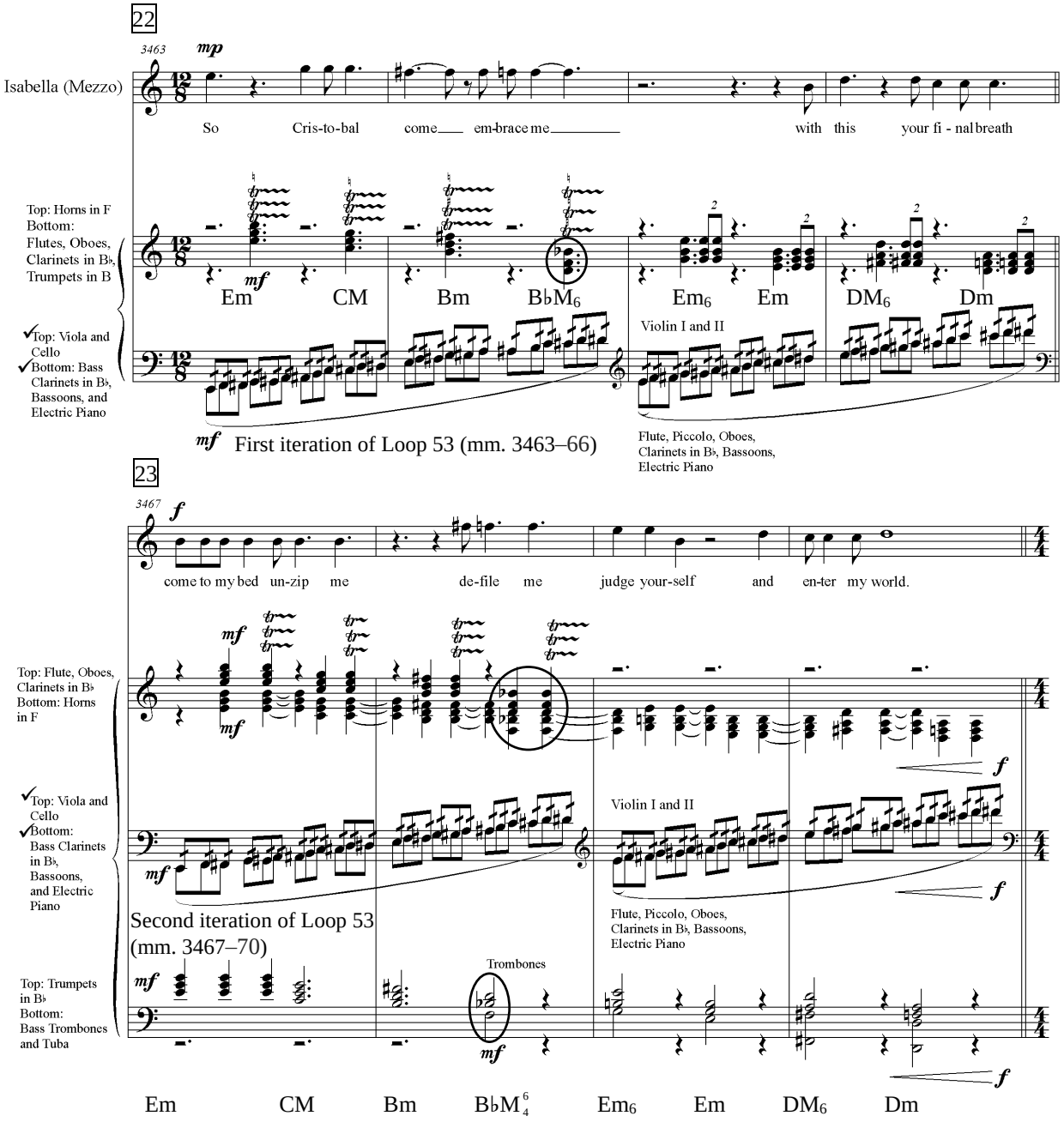
Example 62 (Continued)



Example 62 (continued)

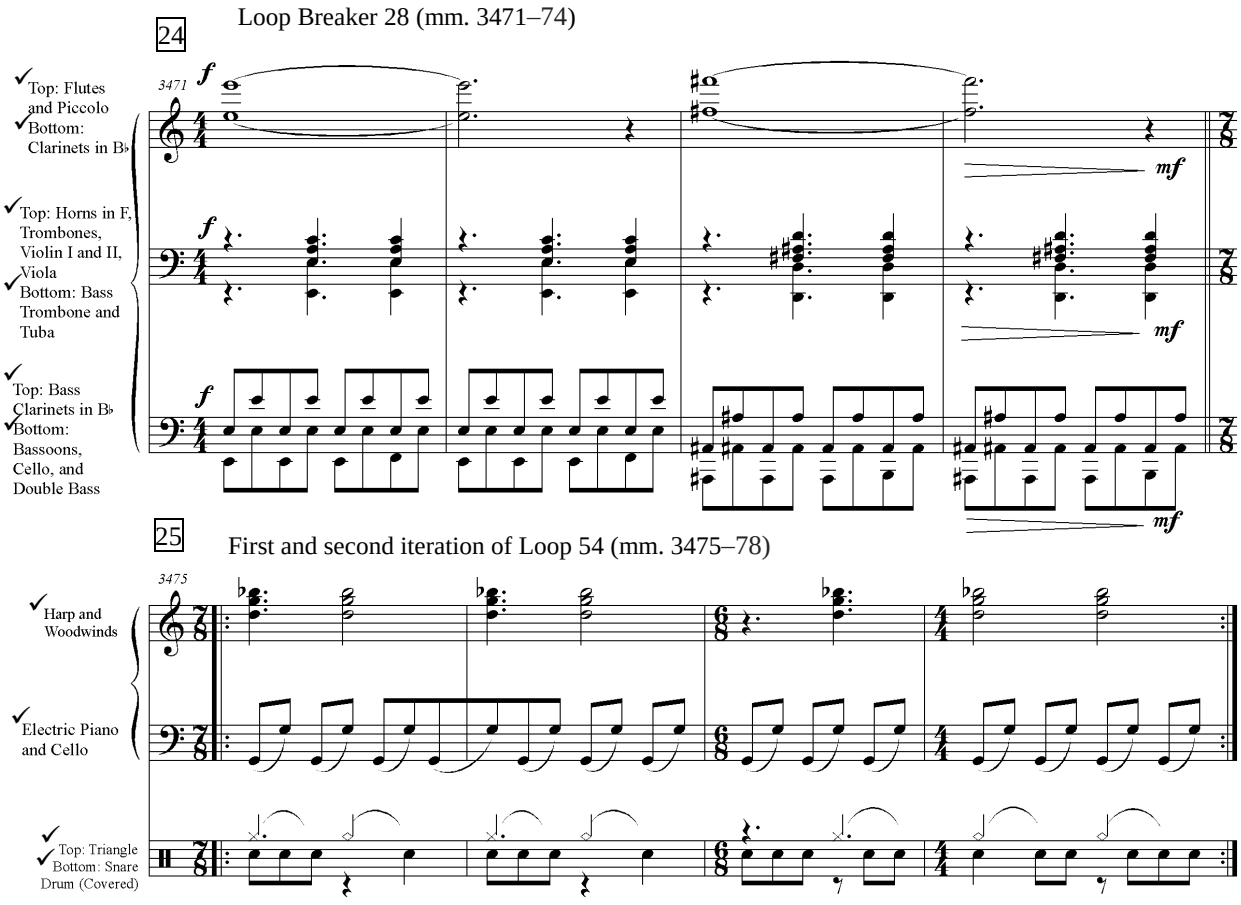


Example 63: Act III Epilogue, mm. 3463–78, rr. 22–25

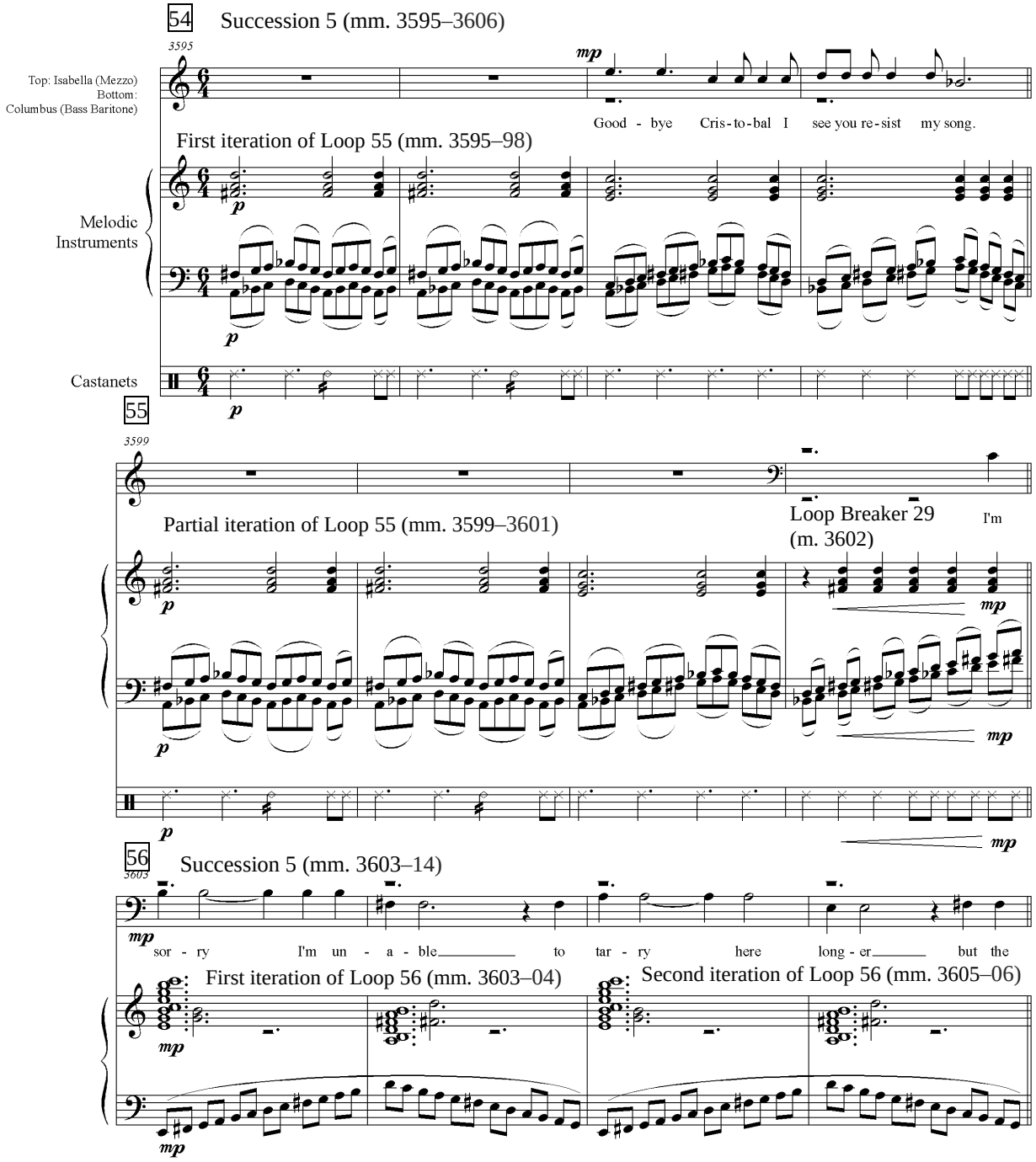


✓: Instruments forming Loop 53, Loop Breaker 28, and Loop 54

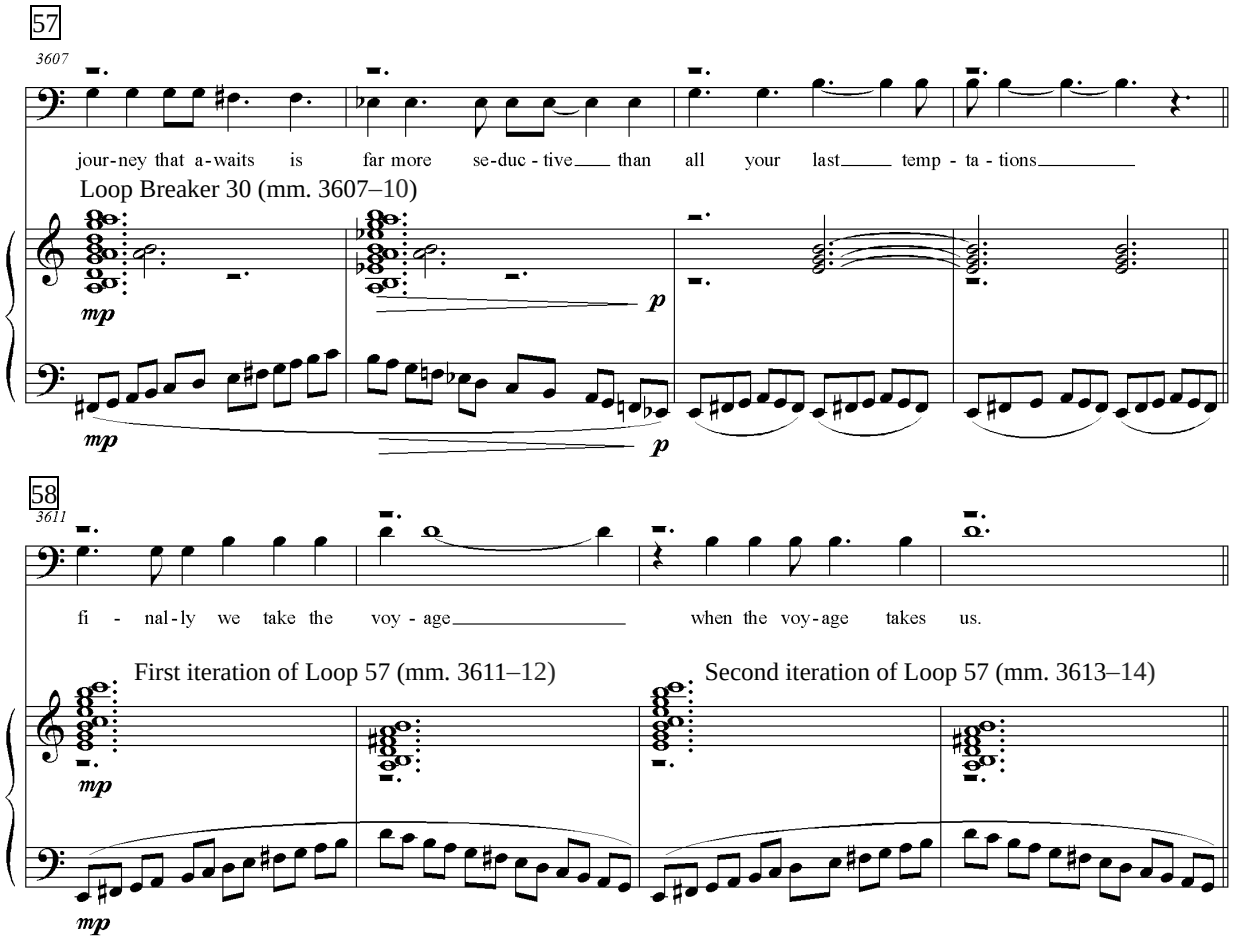
Example 63 (continued)



Example 64: Act III Epilogue, mm. 3595–3614, rr. 54–58



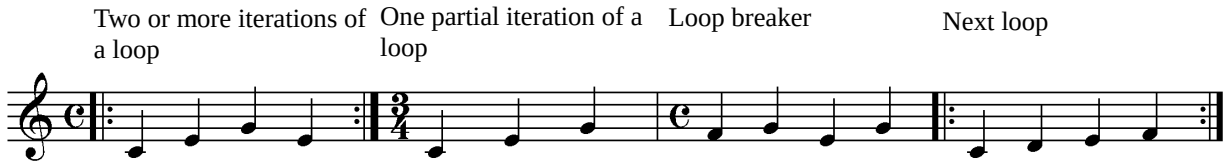
Example 64 (continued)



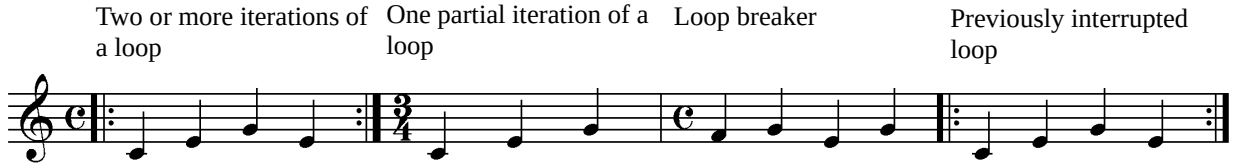
APPENDIX

FIVE SUCCESSIONS OF LOOPS AND LOOP BREAKERS

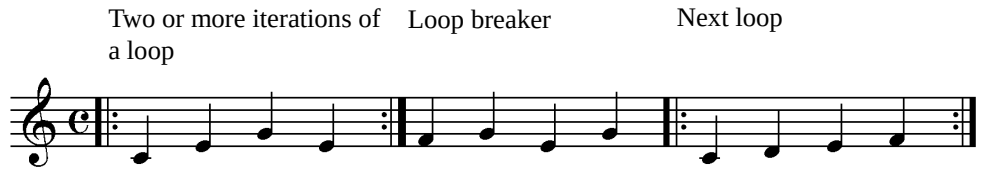
Succession 1



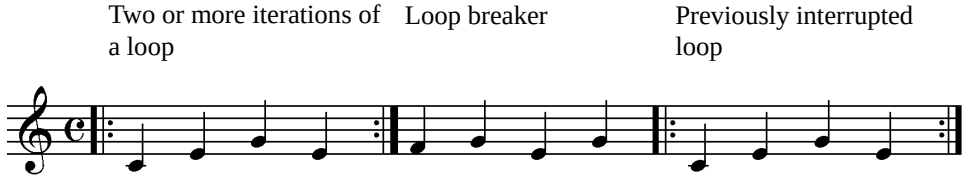
Succession 2



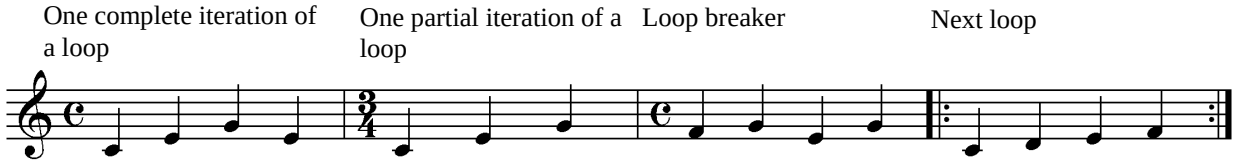
Succession 3



Succession 4



Succession 5



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